

Property Brand Management

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Applying Causal Analysis to Develop a Strategic Management Tool for Office Property Brands

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Preface

Brands' vital influence on companies' success in the business-to-customer sector has long been acknowledged in research and practice. In the same way, a growing number of contributions have demonstrated the relevance and applicability of the brand concept in the business-to-business area. Across several industrial markets, there has been substantial evidence for brands' effectiveness regarding customers' orientation in the market, quality and risk perceptions, and their willingness to pay a price premium.

In contrast to these encouraging findings from other industries, the real estate sector lacks awareness for brands in general and for property brands in particular. There is great uncertainty regarding the economic relevance of brands in terms of their influence on the overall financial success of properties, leading to a general hesitance in brand building investments. Moreover, limited information on the relevant steps to establish a strong property brand often results in an inconsistent market presence and inefficient branding activities.

In his work, Dominique Pfrang explicitly addresses these two major obstacles and closes the research gap regarding the relevance and development of property brands. For this purpose, the author initially provides a theoretical and conceptual discussion of property brands from a marketing and a real estate perspective and identifies their particularities in light of their characteristics as industrial goods. The first study explores the relationship between an office property's brand status and its economic performance in terms of its market value under consideration of potentially relevant covariates, such as building age, usable area, and rental prices. The Investment Property Databank (IPD) was chosen as a reliable and comprehensive data source. In comparison to other contributions in the field of real estate research, the author's work stands out by applying a multilevel analysis that accounts for the spatial and temporal structure of the data set. The second study focuses on identifying the main drivers of strong property brands on the basis of the results of an interview series covering Germany's top 10 office property markets. For this purpose, the author applies partial least squares structural equation modeling to test a suggested property brand equity model, and additionally extends its findings with an importance-performance matrix analysis to derive meaningful advice for real estate practitioners.

This work, which has been accepted as a dissertation at the University of Regensburg, is the first contribution in the field of real estate research that covers brands in this level of detail, and empirically investigates their relevance and potential components. The author's transfer of findings and insights from the area of brand management research to the real estate industry not only contributes to validating the applicability of the brand concept in a formerly neglected business-to-business segment; for the first time, the role and essence of property brands are comprehensively explored from a behavioral perspective.

The findings of this work open up a promising field of research that offers a rich potential for future contributions from the fields of both real estate and marketing. In the same way, this dissertation provides strong arguments that encourage real estate decision makers to invest in building strong property brands and emphasizes relevant brand components that should be taken into account during this process. Overall, I am convinced that this disser-

tation will become widely accepted by researchers and practitioners, and I hope that it provides impetus for further research on this topic.

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The idea for this dissertation was developed as a response to the discrepancy between positive reporting on brands' influence on the economic success of properties and, at the same time, real estate decision makers' reluctance to invest in developing strong property brands. In this light, the question that arose was whether practitioners in the real estate industry are right to hesitate or whether a stronger commitment could be justified. Moreover, there was a need to clarify which aspects should be considered when aiming to establish a property brand in the market. In view of the study results, it is hoped that real estate market participants feel encouraged to strengthen their branding efforts and that real estate researchers feel motivated to open up the challenging but promising field of brand management in the real estate industry.

First I would like to express my sincere thanks to my advisor and academic teacher, Prof. Dr. Karl-Werner Schulte HonRICS, who gave me professional and personal guidance throughout my dissertation project and encouraged me with his valuable ideas and suggestions and his constructive feedback. I am also obliged to Prof. Dr. Roland Helm, who readily accepted being my co-advisor.

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List of Abbreviations

ANOVA	Analysis of Variance
AVE	Batten, Barton, Durstine & Osborn
BBDO	Capital Asset Pricing Model
BLUP	Best Linear Unbiased Predictions
CB-SEM	Covariance-Based Structural Equation Modeling
conf. int.	confidence interval
df	degrees of freedom
DGNB	Deutsche Gesellschaft für Nachhaltiges Bauen
et al.	et alii
FIML	Full-Information-Maximum-Likelihood
gif	Gesellschaft für immobilienwirtschaftliche Forschung
ICC	Intraclass correlation coefficient
IPD	Investment Property Databank
IT	Information Technology
LEED	Leadership in Energy and Environmental Design
ML- R^2	Maximum-Likelihood-Ratio- R^2
N. N.	nomen nominandum
PLS	Partial Least Squares
PLS-SEM	Partial Least Squares Structural Equation Modeling
REIT	Real Estate Investment Trust
REML	Restricted-Maximum-Likelihood
SEM	Structural Equation Modeling
std. dev.	standard deviation
std. err.	standard error
sqm	squaremeter

1 Introduction

1.1 Problem Set, Objectives, and Relevance of the Study

Today, the importance of brands for companies' success in business-to-consumer markets has been widely accepted in research and practice.¹ Similarly, a growing number of contributions have found evidence for the applicability and relevance of the brand concept in different business-to-business markets.² In particular, against the background of an increasing similarity, standardization, and thus exchangeability of products, services, and companies, brands are considered a viable opportunity for differentiation.³ As research shows, strong industrial brands can support customers' orientation in the market, reduce their perceived risk, contribute to their satisfaction, enhance their quality perceptions and loyalty, and increase their willingness to pay premium prices, among others.⁴ This notion is also supported by an increasing range of different brand awards, conferences, and working groups specializing in brands in the business-to-business sector.⁵ For many companies, brands already represent their most valuable assets and seem to still be further increasing in value. In a study by PRICEWATERHOUSECOOPERS/SATTTLER in 2001, brands accounted for 56% of companies' market value in Germany. In a repeat of the study in the year 2006, 67% of the companies' market value was determined by brands.⁶ Even if those findings do not relate exclusively to the industrial setting, they strongly suggest that brands are a major strategic asset for companies across different economic sectors.⁷

Brands' inherent vulnerability to changes in the market environment requires an understanding of how strong brands are built and managed effectively.⁸ The need for guiding principles for building strong brands has led to an increasing number of contributions centering on brand building. One stream of research focuses mainly on conceptual models emphasizing possibilities for internal brand building in order to align employees' behavior in customer interactions with a company's strategic objectives.⁹ The dominant stream, however, relates to external brand building and focuses on the communication of the brand to the customer and the formation of perceptions in customers' minds.¹⁰ Although internal brand building is an important company-based anchor of a brand, it is necessary to go beyond internal efforts and focus on external brand building activities in order to

¹ See FISCHER/VÖLCKNER/SATTTLER (2010), p. 823; ESCH (2008), p. 4; KELLER (2008), p. 1; KOTLER/PFOERTSCH (2007), p. 358.

² See BIEDENBACH (2012), pp. 1-2; BAUMGARTH (2010), pp. 39-47; RICHTER (2007), p. 169.

³ See SRINIVASAN/MURTHY (2008), p. 174.

⁴ See LEEK/CHRISTODOULIDES (2012), p. 107.

⁵ See BAUMGARTH (2010), p. 45.

⁶ See PRICEWATERHOUSECOOPERS et al. (2006), p. 9; PRICEWATERHOUSECOOPERS/SATTTLER (2001), p. 11.

⁷ See BIEDENBACH (2012), p. 2; BAUMGARTH (2010), p. 40.

⁸ See BIEDENBACH (2012), p. 2; WEBSTER/KELLER (2004), pp. 388-389.

⁹ See, for instance, the contributions of BAUMGARTH/SCHMIDT (2009), WALLSTRÖM/KARLSSON/SALEHI-SANGARI (2008), and URDE (2003). See also the work of LYNCH/DE CHERNATONY (2004) and WEBSTER/KELLER (2004), who also highlight the importance of internal brand communication.

¹⁰ See, for instance, the work of KALAFATIS et al. (2012), BIEDENBACH/MARELL (2010), BEVERLAND/NAPOLI/YAKIMOVA (2007), and BERRY (2000).

compete in the market and enhance a brand's strength.¹¹ However, there has been no consensus regarding an optimal model for building a strong brand.

One widely acknowledged approach for understanding how strong brands can be built and managed refers to the concept of customer-based brand equity, which reflects "the differential effect of brand knowledge on consumer response to the marketing of the brand."¹² Based on models from the field of cognitive psychology, this concept captures different facets of individuals' brand-related knowledge that can be considered potentially key components that need to be addressed and enhanced in order to strengthen a brand in customers' minds.¹³ Consequently, analyzing brand equity promises valuable insights regarding the necessary steps that contribute to building a strong brand.¹⁴

Even if there is growing support for the relevance of brands across different business-to-business sectors, and the theoretical and empirical foundation for establishing industrial brands is continuously extended, it would be misguided to hastily make inferences from one industry sector to another. In particular, the inherent heterogeneity of business-to-business markets ranging from raw materials to auditing services requires a sector-specific assessment of brand relevance and the main drivers for building brand equity in light of the sector's characteristics.¹⁵ In this regard, a continuous need for research aimed at substantiating the concept of brands and brand equity across different business-to-business market has been highlighted.¹⁶

In contrast to the growing awareness of brands in other business-to-business settings, the concept of brands in general and property brands in particular is still relatively new to the real estate industry. Although an ongoing tenant market situation and a progressive level of technical and functional standardization have increased competition in German space and investment markets for commercial and, in particular, office properties, market participants' appreciation of the field of brand management is still at a considerably low level. In fact, marketing budgets regularly remain below 1% of a property's total investment volume during its development and leasing phase and are almost completely diminished during its later operation.¹⁷ This reluctance is even more questionable in light of a study carried out by ERNST & YOUNG REAL ESTATE (2011) indicating that marketing is perceived as the most important success driver of real estate asset management.¹⁸ In this regard, BRADE critically stated in 2001 that in spite of a growing interest in real estate marketing, a comprehensive and strategic perspective that allows for long-term oriented efforts, such as building a brand, is commonly neglected in favor of rather short-term sales activities focused directly on letting activities.¹⁹

¹¹ See BIEDENBACH (2012), p. 3.

¹² See KELLER (1993), p. 8.

¹³ See BENDIXEN/BUKASA/ABRATT (2003), pp. 371-372; KELLER (1993), pp. 1-3.

¹⁴ See BIEDENBACH (2012), pp. 3-4.

¹⁵ See BAUMGARTH (2010), p. 48; See VAN RIEL/DE MORTANGES/STREUKENS (2005), p. 846; MUDAMBI (2002), pp. 525, 531-532; AAKER (1996), pp. 102-103.

¹⁶ See BIEDENBACH (2012), p. 4; VAN RIEL/DE MORTANGES/STREUKENS (2005), p. 846; MUDAMBI (2002), pp. 525, 531-532; AAKER (1996), pp. 102-103.

¹⁷ See N.N., IMMOBILIEN ZEITUNG (2004), p. 15.

¹⁸ See ERNST & YOUNG REAL ESTATE (2011), p. 12.

¹⁹ See BRADE et al. (2008), p. 715; BRADE (2001), pp. 2-4.

Indeed, as owners increasingly aim to differentiate their properties from their competitors', branding activities in the context of development projects have gained importance in the real estate industry throughout recent years.²⁰ This holds particularly true for the office sector, where high standardization levels in saturated markets have led to a growing interchangeability of respective properties. In response, real estate decision makers typically aim their branding activities at potential tenants and expect brands to contribute to a property's success in terms of shorter lease-up periods, higher rental prices, and higher tenant retention rates, ultimately resulting in a higher market value. While comprehensive empirical evidence is still missing, anecdotal experiences seem to support this assumption: According to project developers such as Tishman Speyer, brand management activities strengthen a property's marketability and can help to realize rental prices that are 10% to 15% above local comparables, even if a property's technical and functional features do not completely meet today's standards.²¹ Similarly, the value of brand management activities has been realized in cases where a property suffers from negative occurrences, such as construction delays and quality deficiencies. In this regard, one of the most prominent cases in Germany is the repositioning and renaming of "The Squire" (former "Airrail Center"), an office building with a gross lettable area of 150,000 square meters next to the Frankfurt/Main airport. A professional brand management team was involved and was able to significantly improve the letting success and overall market acceptance of the project, which had repeatedly seen negative press coverage before.²²

Altogether, the German real estate industry currently sees a variety of efforts to establish successful property brands, especially in the office property sector. However, in most cases, respective activities are fragmented and inconsistent, exhibit a high level of discontinuity, and seem to lack a clear-cut target orientation. Most brand management efforts do not go beyond creating a name, logo, and claim for a subject property. Thus, the primary focus usually is to build short-term awareness for a certain building in the market, rather than to create a valued brand.²³ In particular, the orientation toward concepts from the field of business-to-customer markets can be seen critically in this regard, since corresponding brand building efforts do not meet the particularities of properties as industrial goods in an organizational renting context.²⁴ Consequently, the majority of office property brands seem to lag behind their actual potential in terms of their effectiveness.²⁵

The underlying reasons for these deficiencies seem to be mainly twofold: For one thing, there is substantial uncertainty regarding the overall effectiveness and thus relevance of brands in an office property context. Thus, market participants' overall interest and willingness to invest in brands is highly limited. For another, there is a high level of uncertainty regarding appropriate ways of building strong brands. Consequently, brand building efforts are often unfocused and fragmentary. The extant literature in the field of real estate research has only marginally contributed to a reduction of these uncertainties. While the concept of brands has been increasingly discussed in other business-to-business sectors,

²⁰ See MONATH (2007), p. 9; WOLLMERSTAEDT (2005), p. 15.

²¹ See N.N., IMMOBILIEN ZEITUNG (2007), p. 52.

²² See N.N., IMMOBILIEN ZEITUNG (2011), p. 11.

²³ See ZITELMANN (2005), p. 15.

²⁴ See BINCKEBANCK (2006), p. 2.

²⁵ See N.N., IMMOBILIEN ZEITUNG (2009), p. 32; N.N., IMMOBILIEN ZEITUNG (2008), p. 10.

real estate research and practice crucially lag behind. In fact, fewer than 10 English and German research contributions that specifically address property brands could be identified in a literature review covering the 15 most important international real estate journals. Similarly, a review of the literature on brand equity in a business-to-business context identified only one study (ROBERTS/MERRILEES (2007)) focusing on tenants in a shopping center. Office properties have not been previously chosen as a context for examining the brand equity construct in an industrial environment.

Against the background of the gap in the existing body of knowledge, the main objective of this work is twofold: (1) to examine the potential relevance of brands in an office property setting and (2) to investigate how strong brands can be built in customers' minds in this context. Correspondingly, the following research questions provide guidance to the overall study procedure:

- 1) Are brands relevant in an office property context?
 - a. What are the main characteristics of the office property setting that might have an influence on the relevance of brands?
 - b. What potential functions do brands have for tenants in an office property context?
 - c. How is an office property's brand status related to its economic performance?
- 2) How can strong brands be built in an office property context?
 - a. Which existing brand equity model provides an appropriate basis for conceptualizing the construct in an office property context?
 - b. What model adjustments are necessary to meet the particularities of the office property context?
 - c. What are the key drivers of brand equity in an office property context and how are they interrelated?

Following this set of research questions, this work may contribute to research and practice in several ways: From a research perspective, this study generally adds to the limited body of knowledge on brands in the real estate sector and addresses the need to scrutinize the relevance of brands and the concept of brand equity across different sectors in business-to-business markets. Moreover, the theoretical considerations contribute to characterizing the specifics of office property brands and their functions in organizational leasing decisions. Regarding the brand equity concept, the proposition of a hierarchy of effects between the dimensions of the construct seems particularly valuable for advancing research on brand building as this approach allows for conclusions on the interrelations between different facets of customers' brand knowledge. For real estate researchers, the application of a multilevel analysis in the first study suggests an appropriate way to ac-

count for spatial structures in the investigation of real estate markets. From a practitioners' perspective, the value of this work is twofold: It provides support in the determination of whether investments in brand building efforts are justified in an office property setting and emphasizes the key elements for building strong office property brands in tenants' minds. In addition, extending the results of the brand equity model estimation, an Importance-Performance-Matrix-Analysis is suggested as a valuable tool that can be applied to analyze office property brands and uncover potential areas for improvement.

1.2 Research Context and Limitations

The work relies mainly on a transfer of findings and concepts from the field of business-to-business brands to the real estate discipline. For this reason, the research context is briefly outlined from both perspectives.

From a real estate view, the lack of research in the field of property brands requires a holistic research approach. More specifically, the existing body of knowledge from the field of business-to-business brand management needs to be transferred and adapted in accordance with the particularities of the office property context. In this regard, this work is in line with earlier contributions, such as GERSTNER (2008), STURM (2006), BRADE (1998), and ISENHÖFER (1998), that also referred to other disciplines in order to examine real estate-related issues. This approach is explicitly taken into account in a multidimensional framework of the real estate discipline that integrates all relevant aspects of real estate research and practice from a decision- and behavior-oriented view on the basis of an interdisciplinary research fundament.²⁶ The *House of Real Estate* illustrated in Figure visualizes this concept.²⁷

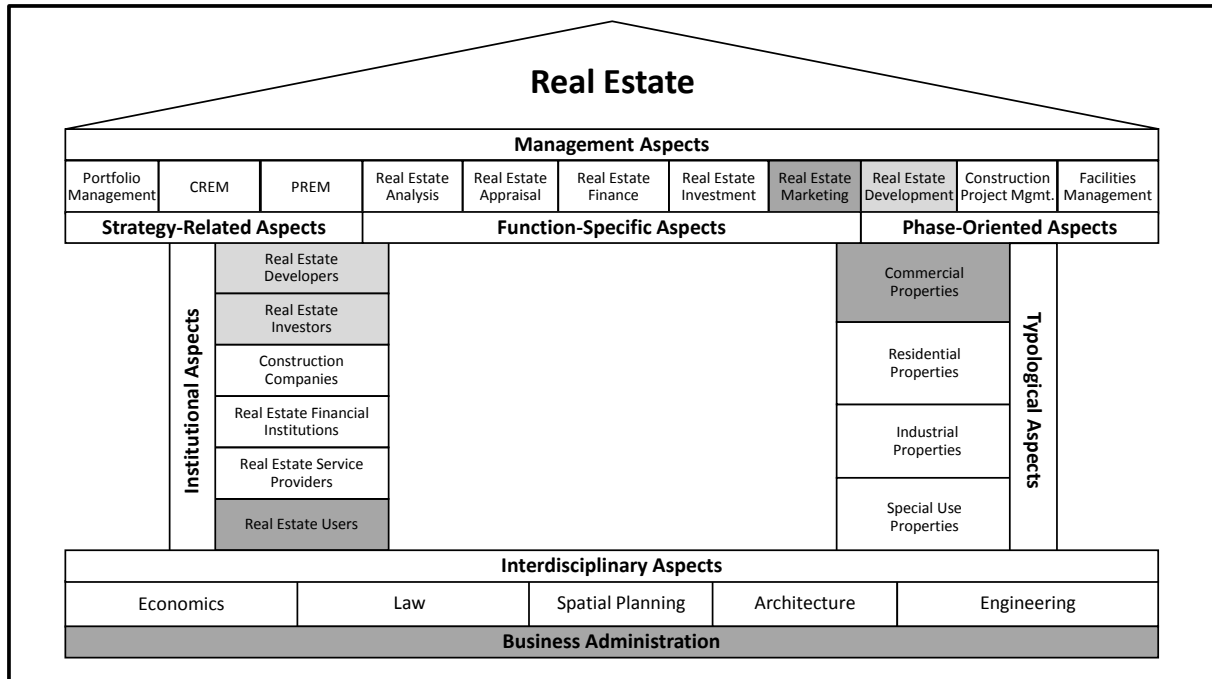
In order to account for the inherent complexity of real estate in academic studies, the discipline builds upon the field of business administration as its theoretical basis and also considers complementary interdisciplinary aspects, such as economics, law, spatial planning, architecture, and engineering. The two pillars reflect institutional aspects related to particularities of real estate market participants, and typological aspects concerning individual characteristics of different property types. Finally, the roof of the *House of Real Estate* represents the management aspects of this multidimensional framework that can be subclassified into strategy-related, function-specific, and phase-oriented aspects. Against this background, office property brands as a field of research originates from the functional management aspect of real estate marketing, although there are several overlaps with the area of real estate development due to the integration of marketing activities in the planning, construction, leasing, and sales process of a building. From a typological view, the field of research refers to commercial real estate markets and relies specifically on the examination of office properties. Regarding institutional aspects, this work focuses on property brands from occupiers' perspective since their organizational decisions play the most critical role for the potential effectiveness of property brands. Indeed, property owners and developers are also directly involved in brand building; however, their perception

²⁶ See SCHULTE/SCHÄFERS (2008), pp. 57-64; HENNINGS (2000), pp. 54-55. The following considerations are also based mainly on the contribution of SCHULTE/SCHÄFERS (2008).

²⁷ All primary points of reference for this work are in dark grey, all secondary points of reference in light grey.

of brands is not the primary focus of this study. Concerning the interdisciplinary foundation of the real estate discipline, this work capitalizes mainly on findings and concepts from the field of business administration.

Figure 1: House of Real Estate



Source: Own translation based on Schulte/Schäfers (2008), p. 58.

From a real estate marketing perspective, the investigation of property brands draws from the limited body of knowledge on property brands and office leasing decisions. In this regard, this work relates to the conceptual contributions of VIITANEN (2004), HÄGG/SCHUTZ (2007), and MUSSLER (2010) that focus on potential drivers of property brands. Moreover, STEINER/FINK's (2009) proposed brand equity model for real estate corporate brands is taken into account. Equivalently, ROULAC's (2007) initial empirical findings on the contribution of a location's image to the perceived value of a property are considered. Regarding leasing decisions, the study strongly builds upon the findings of GERSTNER (2008), who explicitly examined office renting decisions from an organizational buying perspective.

From the perspective of business-to-business brands, this work addresses propositions emphasizing a need to investigate the relevance of brands and the brand equity concept across different sectors of the industrial market.²⁸ Regarding the relevance of brands in different industries, previous studies focused on, for instance, precision bearings (MUDAMBI/DOYLE/WONG (1997)), office equipment (HUTTON (1997)), pumps (BENDIXEN/BUKASA/ABRATT (2004)), chemicals, machinery, and electronics (HOMBURG/JENSEN/RICHTER (2006)), and tractors (WALLEY et al. (2007)). The concept of brand equity has also been examined across several settings such as electrical products (GORDON/CALANTONE/DI BENEDETTO (1993)), office equipment (HUTTON (1997)), manufacturing of industrial goods (MICHELL/KING/REAST (2001)), electrical equipment (BENDIX-

²⁸ See VAN RIEL/DE MORTANGES/STREUKENS (2005), p. 846; MUDAMBI (2002), pp. 525, 531-532; AAKER (1996), pp. 102-103.

EN/BUKASA/ABRATT (2004)), chemicals (VAN RIEL/DE MORTANGES/STREUKENS (2005)), logistics services (DAVIS/GOLICIC/MARQUARDT (2009)), electronic tracking systems (KUHN/ALPERT/POPE (2008)), IT software (KIM/HYUN (2011)), and professional services (BIEDENBACH (2012)). This study is in line with the general approach of these contributions as it aims to investigate the general relevance of brands and the concept of brand equity in a new industry context. In particular, this work relates to ROBERTS/MERRILEES's (2007) publication, which focused on the role of brands in the course of shopping center tenants' decision to renew their management service and lease contract. However, in contrast to the authors' approach, this study considers property brands from a new typological perspective (office properties).

In light of the research context, several limitations of this work should be highlighted. Regarding the field of research, it should be noted again that property brands as product brands are of interest; real estate corporate brands are not the object of this work.²⁹ Thus, inferences from the study results to the field of corporate brands seem generally questionable. Moreover, the study applies a customer-based perspective on property brands and explicitly focuses on leasing decisions as an organizational buying context. In this way, this work is in line with the main stream of research in the field of business-to-business brands and follows an external customer-based view on the brand equity concept. Consequently, this study does not consider an external supplier-oriented perspective on brands, as applied by, for instance, RICHTER (2006), or an internal employee-oriented perspective, as proposed by BAUMGARTH/SCHMIDT (2009) and LYNCH/DE CHERNATONY (2004). The corresponding focus on office tenants' brand perceptions seems particularly appropriate from a real estate perspective as the economic performance of an office property relies mainly on rental income, which mainly determines the development of its market value. However, due to the study focus, the findings neglect the potential influence of internal brand building efforts and might also be limited in their transferability to transaction situations. Finally, from a geographic point of view, this study is restricted to the German real estate market in general and considers primarily the top ten office property markets, thus limiting inferences on smaller regional markets.

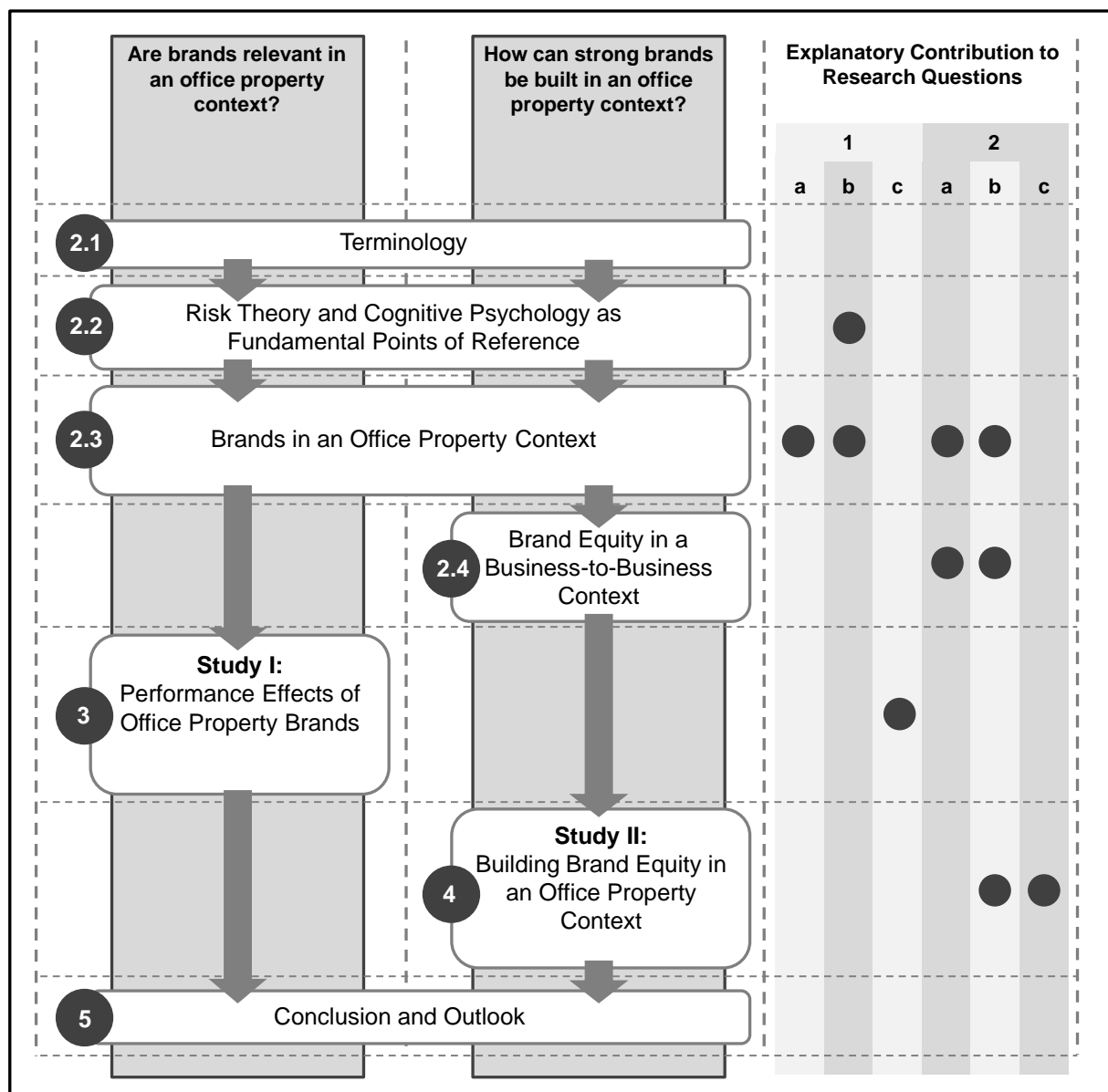
1.3 Study Outline

Subsequent to this introduction, the second chapter provides an overview of the theoretical framework and the conceptual fundamentals of the first and second study. For this purpose, the basic terminologies are briefly specified before relevant aspects of risk theory and the representation of brands in customers' minds are outlined as an argumentative basis for the potential effectiveness and relevance of brands in an office property context. In the next step, particularities of office properties and office property markets are highlighted, and office leasing processes are discussed in an organizational buying context. A subsequent review of the real estate literature characterizes the current body of

²⁹ This restriction seems particularly important since the prevalent lack of research in the field of brands in the real estate sector has led to confusion concerning the respective terminology. Some authors use the term *property brand* or *real estate brand* when actually referring to the brand of a company in the real estate sector. Others denote property brands as *product brands in the real estate industry* in order to highlight that their arguments consider a single building instead of a company. See VEST (2001), p. 132; REHMANN (2001), p. 218.

knowledge in the field of property brands. Building upon these initial steps, the particularities of the office property context are discussed in light of context factors that determine the applicability of brand functions, and thus the relevance of brands, in business-to-business settings. In the next chapter, the customer-based brand equity concept is introduced, and the appropriateness of several practice- and research-based approaches to conceptualizing the construct are reviewed with regard to a set of fundamental model requirements. On this basis, initial points of reference for the development of a brand equity concept for office property brands are derived. Finally, hierarchy-of-effects models are outlined as a framework for examining the relationships between the brand equity components.

Figure 2: Study Outline



Source: Own illustration.

The third chapter focuses on the first key question and presents the results of an exploratory empirical study that examines the relationship between an office property's brand status and its market value, while controlling for potential covariates, in order to draw conclu-

sions on the relevance of brands in an office property context. The chapter briefly outlines the main study objectives, describes the data basis, and introduces multilevel analysis as an appropriate methodology to account for the hierarchical structure of the data set. Finally, the study findings are outlined and discussed, and major limitations of the study are emphasized.

The fourth chapter addresses the second key question and presents the results of a confirmatory study analyzing the customer-based brand equity concept in an office property context. In the first step, the proposed brand equity components are outlined and their relevance in an office property setting discussed. Subsequently, an initial basic framework that suggests a general sequence of the brand equity constructs, building upon a hierarchy of effects, is developed. In the next step, partial least squares structural equation modeling is introduced as an appropriate methodology and the specification and measurement of latent variables briefly outlined. On this basis, the initial concept is developed in more detail. For this purpose, the dimensionality and operationalization of the suggested constructs are discussed in light of the office property context, and more detailed hypotheses regarding the relationships between the brand equity components are derived. Afterward, the data basis is outlined, and the results of the model estimation are presented and extended in an Importance-Performance-Matrix-Analysis. Finally, the study findings are discussed and relevant limitations and drawbacks highlighted.

The fifth chapter summarizes the main findings of this work regarding the guiding research questions, emphasizes limitations that concern the overall procedure across both empirical studies, highlights implications for research and practice, and suggests points of reference for future research in this field. Figure visualizes the different chapters and their logical sequence and indicates their contribution to the research questions.

2 Theoretical Framework and Conceptual Fundamentals

This chapter outlines the conceptual and theoretical considerations preceding the first and second study of this work. For this purpose, the terminology of the fundamental concepts is briefly clarified before substantive points of reference regarding the potential effectiveness of brands are derived from findings in the fields of risk theory and cognitive psychology. In preparation for the first empirical study, the potential relevance and functions of brands in a property context as a business-to-business environment are discussed. In the next step, the concept of brand equity is outlined, and existing practice- and research-based approaches to conceptualizing the construct are reviewed and assessed regarding their appropriateness as a conceptual foundation for the second empirical study.

2.1 Terminology

This chapter briefly specifies *office properties* and *brands in a business-to-business context* as the two main concepts underlying all subsequent considerations in this work.

2.1.1 Office Properties

This work focuses on office properties as a subgroup of commercial properties that also comprise retail and logistics properties and business parks.³⁰ Although at first glance office properties seem to be easily distinguished from other properties, there is no unanimous agreement on a definition, since there are varying perspectives on the subject.³¹ Extant conceptions refer mainly to a general definition of properties combined with a definition of an office building's function from a user's view. Considering the type of use, office space has been characterized as marketable space that serves primarily desk work.³² Office properties can be further specified from physical, legal, and economic perspectives.³³ For the purpose of this work, physical aspects referring to the material basis of office properties and legal aspects denoting particularities in contractual relationships are of lesser importance. Rather, an economic view on office properties seems appropriate since economic benefits are in focus. Following this perspective, office properties have no inherent value arising from their mere physical dimensions. Only if a temporal dimension is taken into account together with the possibility to economically assess the legal rights to own and use a property is the actual value of a property created. More specifically, an office property's value is created through, for instance, rental payments in exchange for the right to use a particular space for a certain amount of time. Consequently, the definition of an office property should capture the sources of the economic benefits that arise from using the property.³⁴

In this regard, an economic understanding of properties differentiates between investment-, balance-, and production-oriented perspectives. Following an investment-oriented understanding, office properties are a capital investment made to generate income by let-

³⁰ See WALZEL (2008), pp. 120, 123-124.

³¹ See LEVASIER (2010), pp. 19-20; ERTLE-STRAUB (2002), p. 13.

³² See DOBBERSTEIN (2008), p. 19; ERTLE-STRAUB (2002), p. 13.

³³ See BONE-WINKEL/SCHULTE/FOCKE (2008), pp. 5, 7.

³⁴ See BONE-WINKEL (1994), p. 23.

ting or selling the property. By contrast, a balance-oriented view suggests considering office properties as a tangible asset in a company's balance.³⁵ While these perspectives represent mainly an owner's point of view, the production-oriented perspective reflects an occupier's understanding of office properties as support factors for companies, factors that are not integrated directly into the final product itself but contribute to its production by providing the necessary space.³⁶ Based on this triad and the specification of their type of use, the definition of office properties used in this work reflects primarily an occupier's but also an owner's perspective.

2.1.2 Brands in a Business-to-Business Context

Literature in the field of business-to-business brands and brand building has repeatedly been described as scarce and fragmented.³⁷ Accordingly, RICHTER (2006) has stated that there is no unanimously accepted definition of brands in this context. Rather, authors rely on the definition of brands developed primarily in a business-to-customer setting and the specifications of the industrial context.³⁸

In this regard, CASPAR/HECKER/SABEL (2002) point out that the terms *business-to-business* and *industrial* rely on a conception of these settings from a customer-oriented perspective. Consequently, the difference in the target groups of business-to-business and business-to-customer settings is their primary constitutive characteristic.³⁹ More specifically, BACKHAUS (1997) describes industrial goods as products and services that are acquired by organizations in order to produce other goods and services that do not represent a mere distribution to end consumers.⁴⁰ Similarly, but conceptually broader, HOMBURG/SCHNEIDER (2001) specify industrial goods as products or services that are acquired by organizations in order to use or consume them in their own production processes or to resell them unchanged to other organizations.⁴¹ It should be noted that in the context of marketing, brands, and branding, the terms *business-to-business* and *industrial* are generally used synonymously due to their joint conceptual basis.⁴² This use is also applied in this work since both terms refer to market participants as relevant point of differentiation.⁴³

As BARNHAM (2009) and BOYLE (2007) have stated, the nature of brands has changed substantially during the last decades from a mere name attachment to a product toward a

³⁵ See PROMPER (2012), p. 50; BONE-WINKEL/SCHULTE/FOCKE (2008), pp. 5, 10-11; PIERSCHKE (2001), pp. 10-12.

³⁶ See FALK (2004), p. 184; GUTENBERG (1983), pp. 2-4.

³⁷ See BIEDENBACH (2012), pp. 3-4; MICHELL/KING/REAST (2001), p. 415; KEMPER (2000), p. 82.

³⁸ See RICHTER (2007), pp. 12-13.

³⁹ See CASPAR/HECKER/SABEL (2002), p. 9.

⁴⁰ See BACKHAUS (1997), p. 8.

⁴¹ See HOMBURG/SCHNEIDER (2001), p. 589.

⁴² See BINCKEBANCK (2006), pp. 18-19; CASPAR/HECKER/SABEL (2002), pp. 9-10; KLEINALTENKAMP (2000), p. 174.

⁴³ In line with BINCKEBANCK (2006), p. 18 and CASPAR/HECKER/SABEL (2002), p. 9, the term *investment good*, also often used synonymously, is not applied in this work as it misleadingly implies that an acquisition is necessarily associated with an investment decision. (See HOMBURG (1998), pp. 54-55.)

psychological construct.⁴⁴ According to BRUHN (2004), this development resulted mainly from the fact that approaches originate from varying fields of research and practice.⁴⁵ More critically, KAPFERER (2004) pointed out that each researcher in this field tends to introduce a new definition or variation of the term,⁴⁶ and STERN (2006) criticized the instability and pluralism of approaches to defining brands.⁴⁷ Consequently, several attempts have been made to categorize the range of definitions.

WELLING'S (2006) approach to classifying brand definitions seems practicable in order to provide a brief overview of the historic development of the terminology. The author identified three main streams of definitions: (1) an early, attribute-focused approach, concentrating on constitutive characteristics of brands as added product characteristics; (2) a product-focused approach, incorporating the product or service itself; and (3) a more recent behavioral approach, centering on psychological effects of brands.⁴⁸

Following a basic understanding of brands, as proposed in the initial work on brand management by DOMIZLAFF (1939), a brand is nothing but a physical label or sign added to a product in order to specify its origin. In the same way, MELLEROWICZ (1963) states that brands are mere signals of their producer or manufacturer and guarantee a stable quality level.⁴⁹ In this context, a range of different catalogues enumerating characteristics, such as a minimum level of market penetration, have been developed in order to distinguish branded from non-branded goods.⁵⁰ However, this attribute-focused understanding of brands seems inappropriate today since the scope of brands has significantly broadened from a mere product focus into incorporating organizations, services, individuals, events, ideas, and other entities. An early definition of brands proposed by the AMERICAN MARKETING ASSOCIATION (1960) represents a product-focused approach concentrating on an identification and differentiation function. From this perspective, a brand is "(...) a name, term, sign, symbol, or design or combination of them which is intended to identify the goods and services of one seller or a group of sellers and to differentiate them from those of competitors."⁵¹ This product-focused view of brands is also found in the legal definition of brands in Germany.⁵² However, following this definition, brands are limited mainly to their sensual

⁴⁴ See BARNHAM (2009), p. 593; BOYLE (2007), p. 122.

⁴⁵ See BRUHN (2004), p. 5.

⁴⁶ See KAPFERER (2004), p. 9.

⁴⁷ See STERN (2006), p. 216.

⁴⁸ See WELLING (2006), p. 27. Other approaches are proposed by, for instance, WOOD (2000), p. 666, who differentiates between approaches with an emphasis on brand benefits to companies and benefits to consumers, or by STYLES/AMBLER (1995), pp. 581-583, who distinguish between a product-plus approach referring to a brand as an addition to a good, and a holistic approach that centers on the brand itself. A similar categorization of product-plus and holistic approaches is also suggested by AMBLER/ROBERTS (2009), p. 748.

⁴⁹ See MELLEROWICZ (1963), pp. 39-40; DOMIZLAFF (1939), pp. 37-39.

⁵⁰ See WELLING (2006), p. 39-40 for a more detailed overview of respective contributions.

⁵¹ AMERICAN MARKETING ASSOCIATION (1960) cited in WOOD (2000), p. 664. In 1995 the AMERICAN MARKETING ASSOCIATION added the phrase "(...) and any other feature (...)" to its definition in order to open toward intangible aspects of brands. (See AMERICAN MARKETING ASSOCIATION (1995), p. 1.) With some variations concerning the explicit inclusion of the underlying product or service, this approach is still found in numerous contributions in the field of brand and marketing literature. (See, for instance, the work of KOTLER/GERTNER (2002), p. 249; KOTLER/BLIEMEL (2001), p. 736; DIBB et al. (1997), p. 264; AAKER (1991) p. 7; KOTLER (1991), p. 442.)

⁵² See MARKENG §3 Abs. 1. Brands are defined as all signs, words and names, illustrations, letters, figures, acoustic signs, three-dimensional designs including a good's form, packaging, and

and mostly visual representations; sources, mechanisms, and functions of brands are neglected. Overall, attribute-focused and product-focused definitions of brands seem inappropriate when the objective is to examine the relevance, functions, and underlying drivers of brands in a particular context.

Based on the realization that brand characteristics such as design, packaging, and names cannot fully explain consumers' brand-specific behavior, more recent approaches to defining brands apply a behavioral perspective, emphasizing brand effects in individuals' minds.⁵³ A behavioral understanding of brands that incorporates their effectiveness concerning all relevant stakeholders has already been suggested by BEREKOVEN (1978).⁵⁴ However, only during the last decades has this perspective found growing acceptance in brand literature.⁵⁵ Against this background, KELLER/APÉRIA/GEORGSON (2008) described brands as "(...) something that resides in the minds of consumers. (...) a perceptual entity that is rooted in reality but is more than that and reflects the perceptions and perhaps even the idiosyncrasies of consumers."⁵⁶ In the same way, MEFFERT/BURMANN/KOERS (2005) referred to brands as a product's unique image that is anchored in consumers' minds.⁵⁷ With a more functional focus, ESCH (2008) defined brands in a similar way: as images in stakeholders' minds that have an identification and differentiation function and have an influence on choice behavior.⁵⁸

This customer-based specification of brands has not only found wide acceptance in a business-to-customer context but has also been repeatedly suggested for application in a business-to-business context. For instance, BAUMGARTH (2010) stated in a contribution on industrial brand management that brands do not exist by themselves, are not formed by respective efforts or legal protection, but exist only on the basis of their representation and effectiveness in the minds of customers and other stakeholders.⁵⁹ Equivalently, BIEDENBACH (2012), BINCKEBANCK (2006), WEBSTER/KELLER (2004), CASPAR/HECKER/SABEL (2002), and UNGER (1986) support the appropriateness of a customer-based perspective on brands in business-to-business settings.⁶⁰ Considering the strong support from earlier studies in the field of business-to-business brands and the objectives of this work, a customer-based understanding of brands seems appropriate.

Against this background, brand management has been described as the process of planning, coordination, and control of all brand-related activities.⁶¹ More specifically, BAUM-

other design elements, such as colors and combinations of colors, that are appropriate to differentiate goods or services of a company from those of other companies. (Translation from German by the author.)

⁵³ See ESCH (2008), pp. 18-19.

⁵⁴ See BEREKOVEN (1978), p. 43.

⁵⁵ In this respect, a major contribution was recently made by findings from the field of neuroeconomics that clearly emphasize brands' effectiveness on a neurological level. See, in particular, the work of CAMERER (2007), MÖLL (2007), and KENNING et al. (2005) for a discussion of neuroeconomics in the field of marketing and brand management.

⁵⁶ KELLER/APÉRIA/GEORGSON (2008), p. 10.

⁵⁷ MEFFERT/BURMANN/KOERS (2005), p. 6.

⁵⁸ ESCH (2008), p. 22. (Translation from German by the author.)

⁵⁹ See BAUMGARTH (2010), p. 41.

⁶⁰ See BIEDENBACH (2012), p. 14; BINCKEBANCK (2006), pp. 20-21; WEBSTER/KELLER (2004), p. 389; CASPAR/HECKER/SABEL (2002), pp. 4, 10; UNGER (1986), p. 6.

⁶¹ See BINCKEBANCK (2006), p. 21; MEFFERT/BURMANN/KOERS (2005), p. 8.

GARTH (2010) points out that industrial brand management refers to all actions (planning, organization, and control) that contribute to high levels of awareness, a differentiating image, and preference of an offering in the minds of professional buyers.⁶²

2.2 Risk Theory and Cognitive Psychology as Fundamental Points of Reference

Before later sections discuss brands in an office property context and highlight the concept of brand equity, it seems appropriate to briefly outline the theoretical fundamentals for the potential effectiveness of brands in the real estate sector. In this regard, risk theory and the representation and processing of brands in individuals' minds promise valuable insights into the underlying reasons for brands' function in a business-to-business setting. For this reason, the two aspects are outlined in the following, and their contribution to the understanding of property brands is briefly highlighted.

2.2.1 Risk Theory

Since individuals are restricted in their perceptions, and all decisions are based on the limited information that is available at a particular point in time, their consequences are uncertain in most instances. Consequently, individuals may perceive opportunities reflecting unexpected gains but also risks representing unexpected losses.⁶³ In this light, risk theory is based on BAUER's (1960) notion that individuals try to reduce their subjective risk, suggesting that their behaviors can be viewed as an instance of risk taking.⁶⁴ From a psychosocial perspective, individuals aim to reduce their perceived risk, since risk represents an unpleasant psychological state of inner tension (dissonance) that individuals strive to solve when an individual tolerance threshold is exceeded.⁶⁵ Since Bauer's initial work, the topic has been frequently studied across various fields of research and has also been adapted in an organizational buying context.⁶⁶ WEBSTER/WIND (1972a) explicitly highlight the importance of individuals' risk perception in business-to-business settings and state that "Understanding the nature and components of perceived risk allows one to make a meaningful analysis of the strategies that organizational buyers adopt for reducing perceived risk to tolerable levels and, therefore, provides a framework within which to think about the requirements for effective marketing strategy."⁶⁷ Similarly, BAUMGARTH/MEISSNER (2010) emphasize that risk perceptions have a strong influence on organizational buying decisions and mainly determine the relevance of brands in this context.⁶⁸ In a brand management context, HUTTON (1997) and MUDAMBI (2002) also refer to

⁶² See BAUMGARTH (2010), p. 42. (Translation from German by the author.)

⁶³ See LÖFFLER/BUSCHINGER (2004), p. 201.

⁶⁴ See BAUER (1960), pp. 389-398. Cited in ROSS (1975), p. 1.

⁶⁵ See GRUNERT (1981), p. 162.

⁶⁶ See RICHTER (2007), p. 59.

⁶⁷ See WEBSTER/WIND (1972a), p. 101. Following their work, studies on organizational buying behavior have frequently considered risk as a main influencing factor. See, for instance, the work of HUTTON (1997), WILSON/LILIEN/WILSON (1991), UPAH (1980), CHOFFRAY/JOHNSTON (1979), and SHETH (1973).

⁶⁸ See BAUMGARTH/MEISSNER (2010), pp. 133-134.

organizational buying behavior as a function of risk.⁶⁹ The importance of risk perceptions in a business-to-business context has also been emphasized by JOHNSTON/LEWIN (1996), who developed an integrative framework of organizational buying behavior building upon the work of WEBSTER/WIND (1972a, 1972b), SHETH (1973), and ROBINSON/FARIS/WIND (1967) and suggested a continuum of perceived risk as a main determinant of organizational buying processes. The authors propose that higher levels of perceived risk are associated with increasingly complex buying center structures, stronger relationships, more formal decision rules, more active search processes, more complex communication networks between buyer and seller, and a growing intensity of negotiations.⁷⁰

Perceived risks might comprise financial risks, performance risks, social risks, psychological risks, temporal risks, and physical risks. Moreover, risks may concern the individual or the organization. On an individual level, relevant personal risk refers to a personal dissatisfaction with the outcomes of the decision, to negative consequences for the relationship with the users of the product or service, or to a reduction of the individual's reputation. On organizational level, main risks relate to a misallocation of resources and social and psychological risks.⁷¹

However, despite a growing body of knowledge in this field, definitions of risk vary depending on the study focus and the underlying understanding of the phenomenon.⁷² Employing an objective-oriented view, risk is defined as a possible deviation from a specific objective, which is not necessarily negative.⁷³ Authors following a decision-oriented perspective emphasize the sources of misguided decisions, whereas an information-oriented definition considers future events as risks if there are subjective or objective probabilities of occurrence.⁷⁴ In the field of brand management in a business-to-business setting, risk has been defined in terms of "(...) the perception of the uncertainty and adverse consequences of buying a product," a definition that is also applied in this work.⁷⁵

Across different settings, risk has been frequently considered to consist of two components: uncertainty in terms of the perceived likelihood of an unfortunate outcome, and severity as a representation of the seriousness of the feared negative consequences.⁷⁶ The severity element depends mainly on the importance of the decision, which in an organizational buying context usually relates to the amount of an expected financial loss or the impact on the company's core business processes.⁷⁷ Moreover, individuals' risk perception is influenced by their demographics, their personal risk tolerance, their company sector, the size and composition of the buying center, their interaction with the seller, market characteristics, the success of the company, and the novelty of the decision.⁷⁸ In general,

⁶⁹ See MUDAMBI (2002), p. 526; HUTTON (1997), p. 429.

⁷⁰ See BACKHAUS et al. (2013), p. 16; JOHNSTON/LEWIN (1996), p. 9.

⁷¹ See BAUMGARTH/MEISSNER (2010), p. 133.

⁷² See HOFMANN/BÜHLER (2004), p. 161; DOWLING (1986), p. 194; BRAUN (1984), p. 21.

⁷³ See KEMPE (2004), p. 5; BRAUN (1984), pp. 23-24.

⁷⁴ See KEMPE (2004), p. 6.

⁷⁵ See MUDAMBI (2002), p. 526; DOWLING/STAEIN (1994), p. 119.

⁷⁶ See BAUMGARTH/MEISSNER (2010), p. 134; BROWN (2007), pp. 50-51; RICHTER (2007), pp. 59-60; PETER/OLSON (2004), p. 87; MITCHELL (1995), p. 116.

⁷⁷ See RICHTER (2007), pp. 59-60; BUNN/LIU (1996), p. 442; HENTHORNE/LATOUR/WILLIAMS (1993), p. 42.

⁷⁸ See BAUMGARTH/MEISSNER (2010), p. 134.

it should be noted that members of a buying center are required to make decisions in the best interest of the company. Consequently, there is an internal pressure for justification and an ongoing danger that the decision is met with criticism from fellow employees.⁷⁹

Strategies to reduce perceived risk can tap into the direction of both risk components.⁸⁰ Individuals may try to reduce their uncertainty concerning the likelihood of a negative outcome through external and internal sources of information. In an industrial context, they might visit other customers (external) or engage in discussions with other members of the buying center (internal). On the other hand, they may aim to limit the severity of the consequences in the case of a misguided decision via external and internal measures. For instance, they might delegate the decision to their superiors (internal) or split their orders between different providers.⁸¹ In this light, brands may act as an external strategy to reduce uncertainty for customers who tend to choose familiar products and services in order to reduce their perceived risk of encountering unexpected negative consequences.⁸² Similarly, buying center members may rely on well-known, highly reputable brands as a safeguard and an argument to justify their decision.⁸³ In this regard, HUTTON (1997) demonstrated that buying center members' personal risk in terms of their fear of personal failure is of greater importance than their perceptions of organizational risks.⁸⁴ Against this background, BAUMGARTH/MEISSNER (2010) identify the reduction of perceived risk as the primary function of brands in a business-to-business environment.⁸⁵

For this work, risk theory emphasizes that company representatives engaged in leasing decisions clearly perceive personal and organizational risks and strive to reduce those risks in terms of their severity and uncertainty. In this light, a property brand may function as a means to reduce individuals' perceived risk. In the case of new tenancies, a well-known and reputable property brand might act as a means to justify one's decision, and in the case of existing tenancies, brands may induce loyalty to a building, potentially leading to a renewal of the lease contract. These considerations clearly support the general relevance of brands in a property context, since property brands may represent a possibility to reduce the perceived risk of both potential and existing tenants. The importance of a property brand in a particular case will depend mainly on the importance that a certain company attributes to the selection of appropriate office space.

2.2.2 Representation of Brands in Customers' Minds

Based on the notion that brands reside in customers' minds, KELLER (1993) emphasizes that understanding how brands should be established and managed requires an understanding of how they are processed, stored, and retrieved.⁸⁶ The extant research in the field of cognitive psychology provides a rapidly growing framework for explaining the ef-

⁷⁹ See RICHTER (2007), p. 60; GREINER (1994), p. 146; HENTHORNE/LATOUR/WILLIAMS (1993), p. 42.

⁸⁰ See COX (1967), p. 72.

⁸¹ See BAUMGARTH/MEISSNER (2010), p. 134; DWYER/TANNER (2002), p. 111.

⁸² See BAUMGARTH/MEISSNER (2010), p. 134; LORENZ (2009), p. 35; BINCKEBANCK (2006), pp. 45-46; KROEBER-RIEL/WEINBERG (1996), pp. 249-249.

⁸³ See KELLER/APÉRIA/GEORGSON (2008), pp. 12-13; RICHTER (2007), p. 61.

⁸⁴ See HUTTON (1997), p. 436.

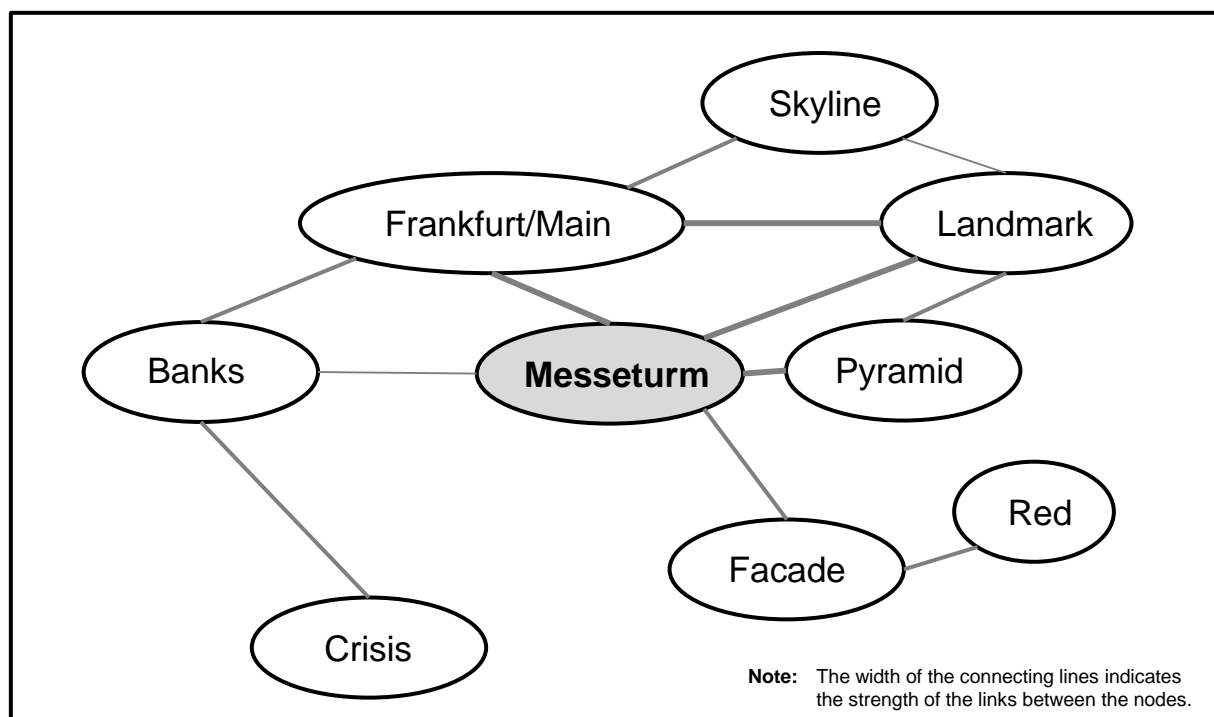
⁸⁵ See BAUMGARTH/MEISSNER (2010), p. 133.

⁸⁶ See KELLER (1993), p. 2.

fectiveness of brands.⁸⁷ Consequently, this section centers on outlining the most relevant models and study findings related to the object of this work.⁸⁸ In a first step, the widely accepted associative network model of human memory, which focuses on the representation of small knowledge structures (propositions), is described. In a second step, the fundamentals of schema theory, which has been applied to examine phenomena related to larger memory structures, are summarized.⁸⁹ Finally, the section introduces mental images as a specific mode of stored knowledge that has been found to exhibit a particular behavioral relevance.

Representation of Brands in Associative Networks: The human associative memory model suggests that brand-related information, which is learned through all kinds of direct and indirect experiences with a brand, is organized in memory networks in individuals' semantic memory. The networks consist of concept nodes (e.g., words, sensations, propositions, and mental pictures, but also emotions, attitudes, and behavioral tendencies) connected through associative links that may vary in strength. Those cognitive structures can be understood as the interpreted meaning of a brand and mainly determine which brand-related information is retrieved, used, perceived, and stored by the individual. Figure visualizes the concept of the associative network model using the 'MesseTurm' in Frankfurt/Main as an example.

Figure 3: Possible Associative Network for the Messturm in Frankfurt/Main



Source: Own illustration following Esch (2008), p. 65 and Esch/Wicke (2001), p. 48

⁸⁷ See RECKE (2011), p. 116.

⁸⁸ For a more detailed overview of relevant theories from cognitive psychology, see, for instance, RECKE (2011), pp. 97-150 and MÖLL (2007), pp. 13-44.

⁸⁹ Associative network theories focus on simple associative structures and are generally atomistic and parsimonious in nature. They suggest that a full theory of human memory can be built upon a small number of basic memory elements. By contrast, schema theory centers on representing larger groups of memory structures in order to capture human memory. See ESCH (2011), pp. 84-85; ANDERSON (1989), p. 120.

The links in the associative network are established and strengthened if two or more memory nodes are experienced or thought about simultaneously.⁹⁰ Consequently, establishing a brand in a customer's memory represents a learning process in which new brand-related information is coded in multimodal associations (e.g., taste, smell, visuals, and episodes) that become connected with existing knowledge structures.⁹¹ For instance, in a real estate context, visiting a site in a certain building or reading about a new development leads to corresponding links between a visitor's experience and the building.

Regarding the retrieval of associations from memory, the concept of spreading activation suggested by COLLINS/LOFTUS (1975) has been frequently applied as a framework to examine the flow of node activation.⁹² Following this model, the activation of an associative network originates from the activation of so-called source nodes that are primarily activated. These nodes represent a current context and may activate adjacent nodes in the sequence of an individual's flow of thoughts. In this regard, the activation of a node depends mainly on its accessibility, which is reflected in the strength between memory nodes.⁹³ In a brand context, brand elements such as names, symbols, products, and other representations of a brand can act as retrieval cues to activate the corresponding associative network and recall the information associated with a certain brand.⁹⁴

Several factors that may influence how associations are used in judgment situations are discussed in the extant literature. According to EITAM/HIGGINS (2010), availability and accessibility of associative networks must be distinguished. Associations' availability refers to their storage in memory, while their accessibility describes their readiness to be activated in a particular situation. Correspondingly, associations may be available but not accessible under all circumstances, and they might not have an effect on an individual's judgment.⁹⁵ FELDMAN/LYNCH (1988) suggest an accessibility-diagnostics model to explain a particular association's impact strength regarding an individual's evaluations. The authors identify two main influencing factors: (1) the perceived informativeness (diagnostics) of the respective node in comparison to alternative nodes and (2) its accessibility given by the strength of its linkage to other nodes in the associative network.⁹⁶ In an experimental study on advertising effects, CHANG (2004) found that the uniqueness of brand-related associations drives their perceived diagnostics, finally leading to enhanced brand evaluations.⁹⁷ This result is also supported by NETEMEYER et al. (2004), who state that unique features offer a simplifying heuristic in choice processes, whereas common brand features offer little diagnostic information.⁹⁸ Similarly, NOVEMSKY et al. (2007) and SCHWARZ (2004) state that individuals perceive judgment tasks as being easier and more fluent when they can rely on associations that are accessible and relevant. Ultimately, this feeling of pro-

⁹⁰ See MÖLL (2007), pp. 20-21; GRUNERT (1991), p. 12; GRUNERT (1990), p. 63.

⁹¹ See RICHTER (2007), p. 65; KEMPER (2000), p. 18; BEHRENS (1994), p. 206.

⁹² COLLINS/LOFTUS's (1975) associative network model is based on a revision of the original model proposed by COLLINS/QUILLIAN (1972).

⁹³ See TEICHERT/SCHÖNTAG (2010), p. 372; COLLIN/LOFTUS (1975), pp. 407-428.

⁹⁴ See LEE et al. (2014), p. 26; ALBA/CHATTOPADHYAY (1985), p. 341.

⁹⁵ See EITAM/HIGGINS (2010), pp. 951-958.

⁹⁶ See AAKER (2000), p. 340; FELDMAN/LYNCH (1988), p. 431.

⁹⁷ See CHANG (2004), pp. 700-701.

⁹⁸ See NETEMEYER et al. (2004), p. 211.

cessing fluency leads to more favorable evaluations of the respective judgment object.⁹⁹ Studies have identified four main factors that have an influence on the strength of the link between memory nodes: the uniqueness of the memory, the extent to which the linkage between the nodes has been cognitively elaborated, and the frequency and recency of its activation.¹⁰⁰ In this regard, the accessibility of an associative network (i.e., the ease with which a certain association comes to mind) can be considered a manifestation and thus an indicator of associative strength.¹⁰¹

Besides associations' accessibility and diagnosticity, the number of nodes in an associative network plays a role in the spreading activation process. According to ANDERSEN/REDER (1999), the accessibility of individual associations weakens with a growing number of nodes, leading to an increase in the cognitive effort needed to retrieve a specific association from memory. However, a higher number of available information is usually associated with a reduction in perceived risk and a higher level of comfort in decision-making processes.¹⁰²

Representation of Brands in Schemas: Schema theory, which was initially developed by BARTLETT (1932), suggests that knowledge is organized in units of information centered on concepts (i.e., objects and the relation that they have to other objects, events, situations, and actions) and that new information is continuously integrated into existing knowledge structures.¹⁰³ In this context, schemas are typically described as organized patterns of thought that organize categories of information and the relationships around them. They are hypothesized to consist of a category label at a top level and expected attributes at a lower level.¹⁰⁴ Thus, from a brand perspective, a schema consists of the typical attributes and standardized opinions that an individual relates with a brand.¹⁰⁵

According to MÖLL (2007), schemas are characterized by three main aspects:¹⁰⁶ (1) Schemas are hierarchical, covering more concrete attributes at lower and more abstract attributes at higher levels. For instance, an individual's 'office building schema' is organized between a superior 'building schema' and a subordinate 'high-rise office building schema'. (2) Schemas have empty slots for specific attributes. These attributes belong to the respective concept but may vary in their content. Thus, the attribute 'building color' can have different values within the 'office building schemata'. (3) Subordinate schemas can inherit attribute values from superordinate schemas as long as there is no contradicting information available. For example, the 'high-rise office building schema' inherits the attribute value 'office' for the attribute 'type of use' from its superordinate 'office building schema'. From a branding perspective, these characteristics lead to the conclusion that a brand always inherits attribute values from its superordinate schema, which is usually the

⁹⁹ See NOVEMSKY (2007), p. 348; SCHWARZ (2004), pp. 343-344.

¹⁰⁰ See MEYERS-LEVY (1989), pp. 203-206; GREENWALD/LEAVITT (1984), pp. 582-583. See also FAZIO (1986) for a more comprehensive discussion.

¹⁰¹ See OLSEN (2011), pp. 16-17.

¹⁰² See ELSTE (2009), p. 32; ANDERSEN/REDER (1999), pp. 186-187.

¹⁰³ See FISKE/LINVILLE (1980), p. 108; BARTLETT (1932), pp. 199-201.

¹⁰⁴ See FISKE et al. (1987), p. 401; FISKE/PAVELCHAK (1986), p. 170.

¹⁰⁵ See RITTINGER (2013), p. 70.

¹⁰⁶ See MÖLL (2007), pp. 23-24. See also ESCH (2011), p. 88, who employs a more comprehensive characterization that differentiates between six aspects.

product category.¹⁰⁷ Likewise, differentiating from competing brands is possible only via brand-specific attribute values.¹⁰⁸

Regarding the function of schemas in individuals' cognitive processes, ESCH (2011) highlights that an existing schema has a main influence on the speed, selection, interpretation, and assessment of new information. In particular, individuals pay more attention to information that fits their corresponding schema. The greater the fit between new information and an existing schema, the easier and more fluent is the information processing.¹⁰⁹

In line with schema theory, the means-end chain approach suggests that persons organize information in memory at different levels of abstraction ranging from simple attributes (e.g., physical characteristics of a product), through functional and practical benefits, up to complex personal values (e.g., the value or payoff of the product to the individual). Thus, complex attitudes and assessments at higher levels will be based upon the underlying attributes on less abstract levels.¹¹⁰

Representation of Brands in Mental Images: The importance of mental images as a specific representation mode of associations has been continuously highlighted in literature.¹¹¹ According to imagery research, individuals can store knowledge in the form of visual imaginations, so-called mental images. Imaginations can cover all kinds of sensory modalities and are considered another form of knowledge representation besides purely linguistic and abstract associations.¹¹² When activated, mental images have different effects on the intake, processing, and storage of information.¹¹³ KROEBER-RIEL/ESCH (2004) found that associations represented in mental images develop a stronger behavioral relevance and are retrieved more easily from memory than verbal associations.¹¹⁴ This result is also supported by the work of ROBERTSON (1987), who identified a positive effect of imagery on respondents' recall and recognition of brand names.¹¹⁵ The so-called 'picture-superiority-effect' regarding mental images' improved accessibility, durability, and processability has been proved in numerous studies.¹¹⁶

In this regard, dual-process models of cognition add to the understanding of mental images by suggesting that judgments are "(...) the product of an intuitive system that is automatic, fast, capable of parallel processing, associative, holistic and affective; and of a rational system that is intentional, slow, reliant on serial processing, rule based, analytic,

¹⁰⁷ See ESCH/FUCHS/BRÄUTIGAM (2000), pp. 686-687.

¹⁰⁸ See ESCH/MÖLL (2005), p. 66.

¹⁰⁹ See ESCH (2011), p. 94; MARCUS/ZAJONC (1985), pp. 143, 169.

¹¹⁰ See GRUNERT/BECKMANN/SØRENSEN (2008), p. 65; ZEITHAML (1988), p. 5.

¹¹¹ See ESCH (2011), pp. 128-139; TEICHERT/SCHÖNTAG (2010), p. 373; BEKMEIER-FEUERHAHN (1998), p. 170; KROEBER-RIEL (1986), p. 92. For a more detailed overview and discussion on the recent state of research on visual imagery in social cognitive psychology, see, for instance, LIBBY/EIBACH (2013).

¹¹² See BABIN/BURNS (1997), p. 33; KROEBER-RIEL (1986), p. 81.

¹¹³ See PETROVA/CIALDINI (2008), pp. 506-508.

¹¹⁴ See KROEBER-RIEL/ESCH (2004), p. 156.

¹¹⁵ See ROBERTSON (1987), pp. 12-15.

¹¹⁶ See KROEBER-RIEL (1993), p. 42. See also ESCH (2011), pp. 134-135 for a more detailed discussion.

and relatively cold.”¹¹⁷ The elaboration likelihood model initially developed by PETTY/CACIOPPO (1986) postulates that the way information is processed mainly determines its level of persuasiveness. The model differentiates between two antagonistic ways of information processing: (1) a central path denoting a high level of cognitive elaboration, leading to high levels of persuasiveness, and (2) a peripheral path characterized by low levels of cognitive elaboration, which do not induce long-term opinion changes. The two main factors influencing the choice of the route are motivation and ability. Moreover, repetition of messages, distractions, and individuals’ mood and need for cognition are discussed as relevant factors.¹¹⁸ KROEBER-RIEL (1986) states that mental images might be more relevant in cases of low involvement and high emotionality than in high-involvement situations with extensive decision-making processes. However, the author points out that even rational decisions can be strongly influenced by the vividness of the information provided.¹¹⁹

There are different theories on the mechanisms underlying mental images’ influence on individuals’ decision making. Following the widely accepted availability-valence hypothesis by HANNAH/STERNTHAL (1984), which builds upon the availability heuristic by TVERSKY/KAHNEMANN (1973), evaluations of objects and events depend mainly on the accessibility and favorability of associations.¹²⁰ Accessibility is driven by the level of cognitive elaboration on the related information and the recency of the information encounter. Coherently, ‘accessibility’ determines on which associations a certain evaluation is built, whereas ‘valence’ is responsible for the direction and magnitude of the assessment.¹²¹ Other studies propose a dominance of the ease of retrieval over favorability. For instance, PETROVA/CIALDINI (2005) suggest that information from ads might be processed more holistically, and consumers base their decisions mainly on the ease with which a mental image is retrieved instead of examining the valence of product information. Similarly, the authors state that when individuals must invest greater efforts to access a certain mental image, their attitude toward the respective object is influenced negatively.¹²²

Against this background, authors in the field of imagery theory regularly highlight three dimensions of mental images that determine their effectiveness: (1) “Attractiveness”, relates to individuals’ positive or negative attitude toward the image. The dimension describes the valence of the associations regarding their content and its evaluation by the individual. (2) “Accessibility”, denotes the ease with which the mental image can be retrieved. Thus, this dimension refers to the clarity and detail of the visual representation. (3) “Vividness”, refers to how vividly an image depicts the perceptual properties of the memorized information. Thus, it reflects the overall presence and vitality of the imagination based on its accessibility and activation potential. This aspect of mental images is some-

¹¹⁷ LIBBY/EIBACH (2013), p. 158. For an in-depth discussion of dual-process theories, see GAWRONSKI/CREIGHTON (2013), pp. 282-312. See also the work of PAIVIO (1977, 1971), who initially developed the dual-coding theory.

¹¹⁸ See the full work of PETTY/CACIOPPO (1986) for a detailed discussion of the elaboration likelihood model.

¹¹⁹ See KROEBER-RIEL (1986), pp. 92-93.

¹²⁰ See HANNAH/STERNTHAL (1984), pp. 633-634; TVERSKY/KAHNEMANN (1973), p. 208.

¹²¹ See KÜSTER-ROHDE (2009), p. 78.

¹²² See PETROVA/CIALDINI (2005), pp. 448-449.

times referred to as a “superdimension” and shows a partial conceptual overlap with the accessibility facet since both relate to the ease of information retrieval.¹²³

It should be noted, however, that the function and effectiveness of mental images has been found more appropriate to represent perceptual and concrete information than to capture abstract facts.¹²⁴ In addition, PETROVA/CIALDINI (2008) identified several factors that are assumed to moderate the effects of imagery processing in product evaluations:¹²⁵ (1) People generally differ in their ability to create and access vivid, clear, and detailed mental images. Thus, people with a lower disposition for imagery processing show a limited effectiveness of mental images in evaluation tasks. In fact, the limited accessibility of the mental images might even lead to negative product assessments. (2) A low vividness of product information may undermine the effect of mental images on the product evaluation. (3) A high cognitive load might complicate imagery processing, leading to limitations in its effectiveness. (4) A low relevance of the mental image from the individual's perspective is also associated with a reduced effectiveness in evaluations and decision making.

In light of the above considerations, several points of reference become apparent for this work. For one thing, a property brand's effectiveness will depend mainly on the network of brand-related associations in individuals' minds. In this regard, establishing property brands should be viewed as a learning process that successively leads to a consolidation of the corresponding knowledge structures. For another, the influence of a brand in the course of individuals' judgments is determined by the ease of retrieving and processing brand-related associations and their overall perceived favorability. Uniqueness was identified as an association characteristic that may contribute to their diagnosticity and accessibility in this context. Thus, property owners and marketers should focus their efforts on creating direct and indirect experiences with a brand that foster attractive, clear, and detailed mental images and brand associations that are easily accessible, favorable, and unique. However, findings from cognitive psychology also highlight that there are personal and situational factors, such as individuals' processing capability, disturbances, and involvement, that may have an impact on a property brand's success but are not in marketers' sphere of influence.

2.3 Brands in an Office Property Context

This chapter is aimed at examining the potential relevance and main functions of brands in an office property context. In this way, it provides the fundamental framework for exploring the relationship between an office property's brand status and its economic performance in the first study. Moreover, the chapter highlights particularities of the office leas-

¹²³ See LIBBY/EIBACH (2013), pp. 151-153; ESCH (2011), pp. 128-139, PETROVA/CIALDINI (2008), p. 510; KROEBER-RIEL (1993), p. 326; BONE/ELLEN (1992), pp. 98-99; RUGE (1988), pp. 100-109. In addition to the three aspects, psychological proximity, visual perspective, direction of motion, and activation power are also discussed as separate dimensions of mental images. See LIBBY/EIBACH (2013), pp. 151-153; ESCH (2011), p. 138; PETROVA/CIALDINI (2008), pp. 511-514. See also MYERS (2009), pp. 5-26 for an in-depth discussion of vividness in imagery.

¹²⁴ See LIBBY/EIBACH (2013), pp. 159-163. In their work, the authors highlight the most widely accepted limitations of imagery but finally suggest that these convictions might need to be reviewed in light of the most recent study findings.

¹²⁵ See PETROVA/CIALDINI (2008), pp. 516-517.

ing context that need to be considered in the conceptualization of an industry-specific brand equity model in the second study. For this purpose, relevant specifics of office properties and office property markets are outlined in the initial step. On this basis, office properties are characterized as industrial goods, and the particularities of organizational leasing decisions are emphasized. Afterward, the chapter examines the current state of research in the field of property brands from a real estate perspective. In the last step, the findings are assessed in light of a set of drivers that have been found to be major determinants of a brand's functions and relevance in the business-to-business context.

2.3.1 Relevant Characteristics of Office Properties, Office Property Markets, and Office Leasing Decisions

Business-to-business products and markets are highly heterogeneous, ranging from low-priced products for an anonymous market (e.g., office materials) to highly specialized services for individual customers (e.g., consulting services).¹²⁶ Consequently, studies in the field of business-to-business brand management should account for the particularities of the subject industry regarding product characteristics, market dynamics, and buying processes.¹²⁷ For this reason, this section focuses on specifics of office properties and markets that are relevant to the subsequent investigation of property brands' economic effects and the development of an appropriate approach to examine how brand equity is built in this context. Initially, general particularities of office properties and office property markets are outlined. From there, office properties are discussed in light of characteristics of industrial goods, and specifics of office leasing processes are emphasized.

2.3.1.1 Particularities of Office Properties

Properties generally exhibit differences in comparison to other assets, in particular movable goods. Consequently, transferring findings from other fields of research to a real estate context demands a thorough consideration of relevant real estate characteristics.¹²⁸ BONE-WINKEL/SCHULTE/FOCKE (2008) provide a detailed and widely acknowledged discussion of distinctive property features leading to typical characteristics of real estate markets that are of relevance for the conceptualization of a theoretical framework for property brands.¹²⁹ In accordance with these authors, the main particularities of office properties are briefly outlined in the following.

The authors highlight *immobility* as the constitutive criterion of real estate. A property's fixed location determines both its possible usage and its economic value. A certain location entails numerous interdependencies between a property and its neighborhood, infrastructure, reputation, and legal conditions. For this reason, the decision for a specific location is of high significance for all stakeholders of a property.¹³⁰

¹²⁶ See BAUMGARTH (2010), p. 48; RICHTER (2007), p. 36-37.

¹²⁷ See BAUMGARTH (2010), p. 48; WEBSTER/KELLER (2004), p. 392; KREUZER-BURGER (2002), p. 16.

¹²⁸ See ERTLE-STRAUB (2002), p. 21.

¹²⁹ See BONE-WINKEL/SCHULTE/FOCKE (2008), pp. 16-23.

¹³⁰ See PEARSON (1991), p. 7.

Since properties are tied to a single location, there is no possibility that two properties are completely identical. At the very least, a difference will be found concerning their concrete location. Thus, *heterogeneity* is an inherent characteristic of all properties.

Properties are characterized by their *complex development process*; starting with a project vision until the final completion and handover to its occupiers demands a substantial amount of time. In fact, durations between two to ten years until completion can be expected.¹³¹ During this process, technical or economic imponderables can lead to further delays. In the same way, marketing periods and costs increase depending on a building's size, since additional space must be absorbed by the market. Consequently, developers' and owners' flexibility to adapt to changes in demand is restricted. In order to succeed in a development project, this time lag must be taken into consideration in order to anticipate the market situation at the point of completion.¹³²

Another case in point is the *extraordinary investment volume* required in direct real estate investments. Similarly, financial resources are regularly bound in the long term. Thus, acquisition and management of large properties is mostly carried out by professional institutions.

Moreover, acquiring, selling, and leasing real estate is connected with *high transaction costs*. On the one hand, taxes, registry fees, and notary fees are directly caused by a respective transaction. On the other hand, substantial information and search costs, such as real estate agent and valuation fees, are induced. Altogether, sunk costs are at an extraordinary level in the case of property acquisitions and leases compared to other goods.

Concerning their economic and technical life cycle, properties are among the most durable goods. In contrast to the virtually unlimited use of the land itself, the usage of buildings is limited.¹³³ In this respect, the *physical life span* of a building (as determined by its decay and deterioration) regularly exceeds its economic life, which is limited mainly by changes in occupiers' requirements.¹³⁴ As a result, properties pass through a series of repeating phases from their initial planning until their demolition.¹³⁵ In this regard, periods of usage can be followed by phases of complete or partial vacancy, conversions, and redevelopments.¹³⁶ In recent years, properties' economic life cycle has been continuously shortening due to the acceleration of changes in occupiers' needs. In general, a potential physical life span of around 100 years and a maximum economic life span of 15 to 20 years can be assumed in the office sector.¹³⁷

Finally, BONE-WINKEL/SCHULTE/FOCKE (2008) highlight the *limited substitutability* of built space. Living and working in a building as a protection against the environment is one of peoples' fundamental needs. It is a substantial component of today's social life and can hardly be substituted by other economic goods.

¹³¹ See ERTLE-STRAUB (2002), p. 40.

¹³² For a detailed discussion of the different stages and components of a property's development process, see HOFMANN (2007), pp. 131-168.

¹³³ See KÜHNE-BÜNING (2004), p. 6.

¹³⁴ See BONE-WINKEL (1994), pp. 30-31.

¹³⁵ See PELZETER (2007), p. 39.

¹³⁶ See ROTTKE/WERNECKE (2008), pp. 211-212; HOFMANN (2007), pp. 23-24; ISENHÖFER (1999), p. 48.

¹³⁷ See ISENHÖFER (1999), p. 47.

As another characteristic, one may add the *multiplicity of stakeholders* that are concerned with a property. As a consequence of their visibility, their influence on public life, and their complexity as a product, properties are in the focus of various stakeholders such as investors, occupiers, construction companies, architects and engineers, public authorities, service companies, land owners, financiers, neighbors, and the public in general.¹³⁸

The characterization of office properties as durable, complex, heterogeneous, and expensive goods highlights several relevant points of reference for this work. For one thing, office properties are unique due to their fixed location. Consequently, in light of the considerations on the cognitive representation of brands in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, one can conclude that associations related to a property's location may exhibit a comparably high level of diagnosticity due to locations' inherent uniqueness. At the same time, however, an office building's location is beyond the scope of marketers' influence once the land plot is selected. Office properties' longevity and the duration of their development process imply that establishing and maintaining a property brand also follows a long-term process. From an occupier's perspective, a high level of search costs obviously increases the perceived risk of leasing situations and fosters the relevance of property brands.

2.3.1.2 Particularities of Office Property Markets

Properties' specific characteristics lead to a number of particularities in real estate markets, which should also be taken into account when aiming to transfer findings from other fields of research to the area of office properties.

In the first place, real estate markets' spatial and typological segmentation is emphasized by BONE-WINKEL/SCHULTE/FOCKE (2008). On the basis of differences in demand and supply, distinct spatial markets that exhibit individual profiles can be identified. In Germany, metropolitan areas such as Berlin, Hamburg, Munich, Frankfurt/Main, Düsseldorf, Hannover, Leipzig, Dresden, Stuttgart, Cologne, Essen, Nuremberg, and Dortmund are considered to be the most relevant office markets in terms of employee numbers and total office space.¹³⁹ However, even within a particular city or region, spatial submarkets characterized by specific supply and demand conditions can be found. Besides this geographic segmentation of real estate markets, one also observes a typological segmentation. Different types of properties might also encounter a distinct market environment. In this regard, the literature distinguishes between four types of properties: (1) residential properties, focusing on habitation and living; (2) commercial properties such as office properties, dedicated to economic purposes; (3) industrial properties, offering space for the fabrication, assembly, distribution, and storage of economic goods; and (4) special use properties, such as hospitals, infrastructure, or sport stadiums, related to specific usage profiles.¹⁴⁰

¹³⁸ See Bone-Winkel/Isenhöfer/Hofmann (2008), pp. 261-267.

¹³⁹ See BULWIEN/DENK/SCHEFFLER (2008), pp. 77-79; BULWIEN/FRÖBA (2008), pp. 35-36.

¹⁴⁰ See the complete work of WALZEL (2008), pp. 119-140 for a comprehensive overview and detailed discussion of property typology. A similar classification is also found in MARTINI (2005), p. 216.

Four main characteristics of real estate markets can be identified regardless of spatial and typological aspects: a low level of transparency, the dependency on (national) economics, a low elasticity toward changes in the market, and market cyclicity.¹⁴¹

Because of properties' heterogeneity, it is difficult to draw generally valid conclusions regarding real estate markets and their dynamics. In particular, data on transactions and leasing contracts is published on an irregular basis or not at all, leading to a *low level of transparency*, especially in office real estate markets.¹⁴² Consequently, real estate decision making is always based on a considerably limited basis of information and regularly requires extensive research efforts. From an occupier's perspective, markets' lack of transparency results in an increase of search costs.

Space demand for office properties decisively *depends on the development of occupiers' economic sectors and the overall condition of the economy*. Changes in an industry or geographic region can have a major influence on the demand for space in spatial and typological market segments. In the same way, interest rates and the development of stock markets have an impact on the attractiveness of real estate investments, thus affecting the development of new office space.¹⁴³

Office properties' longevity and the duration and complexity of their development process result in a *strongly limited flexibility to adapt to changes in demand*. Additional space cannot be delivered to nor superfluous space taken from the market in the short term. In fact, space supply is assumed to be nearly static in the short term.¹⁴⁴

Caused by real estate markets' highly inflexible supply side, changes in the demand for office space lead to respective *cyclical fluctuations in rents and purchase prices*. In this way, an increase or decrease in demand meets a static supply and may result in a rapid upswing or downturn in market prices. In turn, property development rapidly loses or gains attractiveness for property developers, causing a corresponding rise or drop in the number of new developments. From there, the duration of development processes causes a situation where a large number of developments are successively completed and running constructions cannot be stopped, ultimately leading to a downturn in market prices. On the basis of this interdependency between a supply side that is inelastic in the short term and a demand that exhibits low price elasticity, a cyclical up and down is typically found in real estate markets.¹⁴⁵

In light of the considerations in Sections **Fehler! Verweisquelle konnte nicht gefunden werden.** and **Fehler! Verweisquelle konnte nicht gefunden werden.**, the particularities of real estate markets have several implications for property brands. For one thing, the geographic segmentation of office markets implies that property brands might vary in their effectiveness depending on the location and the corresponding market environment. Consequently, this aspect should be taken into account when examining property brands' rela-

¹⁴¹ See BONE-WINKEL/SCHULTE/FOCKE (2008), pp. 22-23.

¹⁴² See BULWIEN (2008), p. 17; ERTLE-STRAUB (2002), p. 37.

¹⁴³ See PFEFFER (2009), pp. 14-15 and WHEATON/NECHAYEV (2005), pp. 100-102 for an in-depth discussion of financial cycles and their influence on real estate markets.

¹⁴⁴ See ERTLE-STRAUB (2002), p. 40.

¹⁴⁵ See PFEFFER (2009), pp. 11-14; the author provides a more detailed analysis of real estate market cycles.

tionship with office properties' economic performance. Similarly, the effectiveness of office property brands might vary over time due to markets' cyclicalities. Thus, in phases of high demand for office space, brands might have a different effect than in times of low demand. Moreover, the lack of market transparency aggravates the perceived risk associated with office leasing decisions and emphasized the relevance of property brands as a potential external strategy to reduce uncertainty. Finally, the time lag between a project's initialization and completion draws attention to the importance of property brands as a potential competitive advantage in market downturns.

2.3.1.3 Office Properties as Industrial Goods

In real estate publications, office properties are generally characterized as industrial goods.¹⁴⁶ Several characteristics of goods in business-to-business markets are highlighted in the literature; their applicability to office properties should be briefly discussed in the following as they are considered to have an influence on business-to-business brands and their management.¹⁴⁷

Type of use: Products and services are not industrial or consumer goods per se but can be differentiated based on their type of use.¹⁴⁸ From an occupier's view, an office property's primary purpose is to support the core business processes of its users by providing the location to produce services and thus intellectual work.¹⁴⁹ Following a classification of GUTENBERG (1983), office properties are support factors for companies; they are not integrated directly into the final product itself but contribute to its production.¹⁵⁰ Consequently, organizations instead of private individuals are regularly involved in decisions related to office properties, such as leasing and transaction situations.

Derived demand: As indicated in the previous section, the amount of office space that a company demands on the market depends directly on the space that is needed for its core processes. Thus, the demand for office space can be characterized as a derived demand that results from company- and industry-specific developments, general economic conditions, and the legal environment.¹⁵¹ In particular, a company's leasing decisions will be guided by the company's strategy for delivering value to its own customers in terms of improved offerings and reduced costs.¹⁵² A company's demand for office space is highly inelastic due to the relatively low relevance of property-related costs compared to personnel costs. When additional space is urgently needed, demand is not price sensitive. However, when no space is needed, even very low prices will not cause a company to lease additional office space.¹⁵³ Moreover, the demand for office space is subject to a company-specific time lag. In situations where additional space is required, companies initially tend to compensate for the increased demand through a more efficient use of their available

¹⁴⁶ See GERSTNER (2008), p. 72; ERTLE-STRAUB (2002), p. 36; BRADE (2001), p. 49; KERN (1992), pp. 13-17.

¹⁴⁷ See RAMASESHAN/RABBANEE/HUI (2013), p. 335; HOMBURG/KLARMANN/SCHMITT (2010), pp. 201-202; KIM/HYUN (2011), p. 424; BINCKEBANCK (2006), pp. 44-45.

¹⁴⁸ See BINCKEBANCK (2006), p. 34.

¹⁴⁹ See FALK (2004), p. 184.

¹⁵⁰ See GUTENBERG (1983), pp. 2-4.

¹⁵¹ See GERSTNER (2008), p. 73; ERTLE-STRAUB (2002), p. 39; BONE-WINKEL (1994), p. 31.

¹⁵² See WEBSTER/KELLER (2004), p. 391.

¹⁵³ See SOTELO (1996), p. 1.

areas. For instance, existing rooms can be rearranged, and working places can be arranged in a higher density. Moreover, companies perceive a high risk when considering the long-term increase in fixed costs associated with a lease contract.¹⁵⁴

Limited number of buyers: Compared to consumer markets, markets for office space have a limited number of customers. However, since all companies at least partially engage in intellectual work, the number of potential occupiers is substantial. Indeed, office properties are individual goods for which additional services play a decisive role.¹⁵⁵ However, in most cases, they are developed for an anonymous and heterogeneous mass market since occupiers are mostly unknown when a construction process is initiated.¹⁵⁶

Organizational buying structures: Corporate renting decisions are generally characterized as multiperson decisions.¹⁵⁷ Based on a buying center approach, GERSTNER (2008) introduces the terms 'renting center' to describe the group of tenant representatives involved in the decision to rent an office property, and 'letting center' to denote owner representatives engaged with the letting process. Moreover, the decision-making process can potentially be influenced by third parties such as consultants and real estate agents.¹⁵⁸ Particularities of leasing processes are discussed in more detail in the following section.

High level of formalization in decision processes: The assumption of a high degree of formalization in leasing and transaction processes is partly questionable. In this regard, GERSTNER (2008) found highly formalized and organizationally anchored decision-making processes only in companies where renting decisions are made on a regular basis. In these cases, expert knowledge exists within the organization and is typically bundled in specialized corporate real estate departments.¹⁵⁹ Hence, the degree of professionalism widely varies across companies. For organizations that do not exhibit a significant level of property-related knowledge, leasing decisions clearly stand out as extraordinary and unique situations. For this reason, formalized processes are rarely found, and respective decisions are often made intuitively or with the help of external experts.¹⁶⁰

Rational decision criteria: It has been assumed that decision makers in business-to-business settings rely on more rational decision criteria, which has also been one of the major reasons why the relevance of brands has been questioned in this context.¹⁶¹ However, newer publications strongly suggest that industrial buying decisions are both rational and emotional as individuals make their decisions based on personal needs within the organizational framework.¹⁶² Nonetheless, WEBSTER/KELLER (2004) concede that "In the typical buying decision, (...) the solution to the organisation's problem will tend to take precedence over the individual's needs, especially when it comes to providing a rationale

¹⁵⁴ See WERNECKE (2004), p. 62.

¹⁵⁵ See ERTLE-STRAUB (2002), p. 37.

¹⁵⁶ See BRADE et al. (2008), pp. 715-716; ERTLE-STRAUB (2002), p. 46.

¹⁵⁷ See ERTLE-STRAUB (2002), pp. 36-37.

¹⁵⁸ See GERSTNER (2008), pp. 199-201.

¹⁵⁹ See GERSTNER (2008), pp. 116-117.

¹⁶⁰ See SCHÄFERS (2004), pp. 237-240.

¹⁶¹ See BAUMGARTH (2010), p. 48; BURMANN/KRAUSE (2009), p. 10; RICHTER (2007), pp. 19-23.

¹⁶² See LEEK/CHRISTODOULIDES (2012), pp. 107-108; BAUMGARTH/MEISSNER (2010), p. 131; BELZ (2010), p. 72; LYNCH/DE CHERNATONY (2004), pp. 405-406.

for the choices made.”¹⁶³ In a property setting, it seems doubtful that rational aspects always dominate individuals’ decision making. In this regard, GERSTNER (2008) points out that tenants’ personal trust in the people behind a property is an important factor in all leasing processes. Moreover, the author emphasized that office properties can cause high levels of emotional arousal and excitement, which usually do not apply to other industrial goods. In this regard, site visits can be particularly emotional experiences with the property.¹⁶⁴ As a result, individuals’ emotional appeal can dominate the decision process if there are no clear decision criteria established in a company’s renting center.¹⁶⁵

Long-term business relationships: The aspect of a general long-term orientation in business relationships seems to be widely fulfilled in a property context. In fact, long-term orientation is continuously emphasized as a vital aspect of the ongoing relation between owners and occupiers of a property.¹⁶⁶ This is also highlighted by MUSSLER (2001), who points to a high level of perceived risk, long development processes, and decision makers’ personal involvement in property leasing and transaction processes, thus making a concentration on lasting relationships inevitable for company representatives.¹⁶⁷

The above considerations about office properties as industrial goods offer some points of reference for the understanding of property brands in this work. On a general level, the particularities of office properties support focusing on property brands as brands in a business-to-business context. From a tenant’s perspective, the role of office properties as support factors draws attention to the importance of a building’s capability to contribute to occupiers’ core processes and strategies to serve their own customers, which should be taken into account by marketers. For another, renting decisions are characterized as complex multiperson decisions that are not necessarily formalized and that can be influenced by emotional factors. Thus, while functional and economic aspects may be dominant in a property brand’s value proposition as a rationale for an organization’s renting decision, marketers should not underestimate the influence of emotional appeals on the individual. Finally, the importance of tenant-owner relationships is emphasized since tenancies are associated with a long-term commitment between the parties. Altogether, those characteristics hint at the potential relevance of brands in a property context and imply that rational as well as emotional and relationship-related experiences might play an important role in how property brands are established in individuals’ minds.

2.3.1.4 Particularities of Office Leasing Decisions

The existing body of knowledge on office leasing decisions is highly fragmented and limited. In particular, publications from the field of real estate do not differentiate between different types of use such as retail, office, or residential buildings.¹⁶⁸ On a general level, however, two main aspects of office leasing decisions that should be briefly outlined in the following have been the focus of interest: the institutions and interactions that are involved

¹⁶³ WEBSTER/KELLER (2004), p. 395.

¹⁶⁴ See HUTFILS (2001), pp. 435-438.

¹⁶⁵ See GERSTNER (2008), pp. 264-265.

¹⁶⁶ See HÖLLER (2001), p. 269.

¹⁶⁷ See MUSSLER (2001), p. 304.

¹⁶⁸ GERSTNER’s (2008) study provides the only comprehensive examination of institutional, structural, and processual components of companies’ office leasing decisions in Germany.

in a leasing decision and the consecutive steps of a leasing process. From an organizational buying perspective, it seems appropriate to initially consider the buying center concept as an additional structural component that allows for analyzing office leasing decisions in more detail.

Buying center structures: Buying center structures are among the most widely accepted approaches to analyzing organizational decision making.¹⁶⁹ Beyond organizational structures, the buying center concept considers communication structures, coalitions, and informal organizational structures and reflects the multipersonal character of organizational buying processes.¹⁷⁰ The term “buying center” denotes a group of people that are put together in order to solve a particular task, such as deciding on the purchase of an industrial good.¹⁷¹ In this context, buying center members may have different roles that mainly relate to their tasks, objectives, and power within the structure.¹⁷² GERSTNER (2008) provides the only work that explicitly examines office leasing decisions in Germany in the context of buying center structures. Based on the role concepts established by WEBSTER/WIND (1972b) and BONOMA (1982), the author suggests six roles within a renting center: renter, user, influencer, decider, gatekeeper, and initiator.¹⁷³ Besides company representatives, third parties such as real estate agents, lawyers, or consultants may become temporary members of the renting center in the roles of initiators, gatekeepers, or influencers. Altogether, the size of the renting center strongly depends on the size of the company in terms of employees.¹⁷⁴ In the course of an office leasing decision, initiators (e.g., company members, external consultants, real estate agencies) trigger the demand for office space as they reveal deficiencies in the current tenancy situation, such as the end of a lease contract or insufficient size or quality of the office space available. Influencers can be third parties such as real estate agencies but also individuals or groups within the company that may use their hierarchical position, informal power, or real estate expertise to support a particular office property in the selection process. The gatekeeper role relates to renting center members that are in charge of screening the property market and determining relevant selection criteria. In cases where no internal real estate expertise is available in the company, real estate agents usually take over this role and may use their function to promote particular office properties for reasons of personal economic benefits, or because they are not fully informed about the company’s needs. Regarding users, GERSTNER (2008) emphasizes that though they are directly affected by the outcomes of the renting decision, the majority of company employees usually do not participate in the leasing process. Moreover, there might be a partial role conflict since users might have other renting center roles as well. The renter is responsible for the overall coordination of the leasing decision process, and the role usually falls to a company’s real estate unit if available. In

¹⁶⁹ See BACKHAUS/BONUS/SABEL (2004), pp. 36-40.

¹⁷⁰ See BROWN (2007), p. 47; BINCKEBANCK (2006), p. 39.

¹⁷¹ See KELLER (1993), p. 44.

¹⁷² See RICHTER (2007), p. 31; HOMBURG/SCHNEIDER (2001), p. 591.

¹⁷³ See GERSTNER (2008), pp. 198-201; BONOMA (1982), p. 113; WEBSTER/WIND (1972b), p. 17. In their original work, Webster/Wind suggest five roles: buyer, user, influencer, decider, and gatekeeper. Bonoma adds the role of the initiator. Gerstner introduces the term “renting center” to describe the members of a buying center structure tasked with renting office space on behalf of a company.

¹⁷⁴ See PACHOWSKY (2000), p. 420.

other cases, persons with less experience and routine might be in charge. The decider is responsible for the final selection of an office property. However, at the time of the decision, the freedom of the decider is limited as the number of available alternatives has already been reduced throughout the selection process. If deciders are involved at an early stage of the leasing decision process, they often have a major influence on the preselection of office properties due to their position in the formal hierarchy of the company.

Institutions and interactions: Altogether, three main groups that are frequently involved in office leasing decisions can be identified: the landlord and owner of the property, the (potential) tenant, and one or more real estate agents.¹⁷⁵ In an office market context, the group of occupiers is highly heterogeneous, comprising companies from different sectors that exhibit different requirements regarding their office space, such as law firms, physicians, banks, public authorities, insurance companies' agencies, audit companies, consultancies, or real estate agents.¹⁷⁶ The tenant and the owner company are in the center of all leasing processes, which are generally characterized by the conflicting interests of the two parties.¹⁷⁷ For this reason, establishing trust between tenant and owner is one of the main objectives in the leasing decision process and, in particular, in the course of direct negotiations. In this respect, the real estate agent can contribute to building trust in cases where both parties are unknown to each other and the owner has superior expertise.¹⁷⁸ Finally, signing a lease agreement not only represents an economic and legal commitment of the contract parties but also is the beginning of a social relationship that has already been initiated during negotiations, site visits, and other forms of direct and indirect personal contact. The recent shortening of office lease periods in Germany has even intensified the relationship between landlords and tenants, since property owners are more motivated to engage in the maintenance of a building and preserve its value.¹⁷⁹ When a lease contract reaches maturity, tenants' trust in a valued tenant-owner relationship can also contribute to reducing perceived risks and ultimately lead to a continuous renewal of the tenancy.¹⁸⁰

In letting processes, property owners regularly rely on real estate agents in order to benefit from their experience, routine, and market insights, whereas tenant companies sometimes act on their own behalf without support from third parties.¹⁸¹ However, in most cases, tenants also involve a professional real estate agent in their renting center in order to compensate for their lack of real estate expertise.¹⁸² Altogether, approximately 80% of all commercial contracts are arranged by real estate agents acting as intermediaries and moderators of the interaction between markets' supply and demand side.¹⁸³ Real estate agencies' main function is to act as a mediator between the conflicting interests of owners and tenants. They contribute to the market transparency and broaden the information available to both parties. In this way, they accompany the leasing process and may have

¹⁷⁵ See GERSTNER (2008), pp. 114-122.

¹⁷⁶ See ERTLE-STRAUB (2002), p. 46; MEYER/SCHNEIDER (2001), p. 96.

¹⁷⁷ See CROSBY/GIBSON/MURDOCH (2003), p. 1491; ERTLE-STRAUB (2002), pp. 46-55.

¹⁷⁸ See GERSTNER (2008), p. 272.

¹⁷⁹ See KARL (2003), p. 25.

¹⁸⁰ See GERSTNER (2008), p. 273.

¹⁸¹ See GERSTNER (2008), p. 116; AENGEVELT/AENGEVELT (2001), pp. 458-461.

¹⁸² See SCHULTE/SCHÄFERS (2004), p. 32.

¹⁸³ See KIPPES (2001), p. 78.

an impact on parties' preference building and final agreement.¹⁸⁴ The supposedly neutral role of the real estate agent, however, is questionable due to the compensation structures. KAMPE (2006) differentiated between the procurement of business transactions on the basis of success-related fees and consulting services, which are usually based on lump-sum payments.¹⁸⁵ In recent years, the role of real estate agents in office leasing markets has clearly developed toward the latter concept, where brokers do not have a neutral position between occupiers and owners of properties but completely take the position of one party as its renting or letting agent and counselor.¹⁸⁶ In cases of landlord representation, the owner partially or completely delegates the marketing process for a property to the real estate agent. Thus, the agent analyzes value-add potentials, identifies appropriate target groups, carries out marketing activities, and accompanies the contracting process.¹⁸⁷ This type of landlord representation is currently the most frequently used form of distribution in the commercial property sector.¹⁸⁸ By contrast, in tenant representations, agents take over the search and selection process for the purchaser and attend the contracting as well.¹⁸⁹ With regard to the Internet's abundance of information, real estate agents increasingly act as gatekeepers and influencers controlling the selection of relevant information and its evaluation and processing.¹⁹⁰

Leasing decision process: Few publications in the field of real estate examine the sequence of different steps in site acquisition or leasing processes. NOURSE (1992) focuses on industrial properties and identifies seven consecutive phases: initiation, determination of size and design, determination of geographic area, search for sites in the target area, evaluation of alternatives, negotiation for the preferred site, and corporate approval.¹⁹¹ However, the author does not differentiate between acquisition and leasing processes and does not consider the particularities of office properties. RABIANSKI/DE LISLE/CARN (2001) centered on the initial steps in companies' site selection process, differentiating between (1) problem definition and spatial needs assessment (initiation, corporate self-assessment, space requirements, and design standards) and (2) site selection and control (selection of the area, identification of alternative sites, evaluation of sites, selection of site, funding, and construction).¹⁹² Obviously, the authors do not explicitly account for the particularities of renting decisions and do not focus on a specific type of use. By contrast, GERSTNER (2008) explicitly examines office leasing decisions and develops a comprehensive model of the leasing process based on a series of case studies. Since this work is the only publication that directly meets the subject of this study, the author's model is briefly outlined in the following. From an occupier's perspective, the author identifies six main steps in an office leasing process that are accompanied by internal approval processes and additionally connected via feedback processes: (1) Companies identify a need for office space and initiate a process to achieve a new lease or a lease contract renewal. (2)

¹⁸⁴ See GERSTNER (2008), pp. 118-119.

¹⁸⁵ See KAMPE (2006), pp. 10-11.

¹⁸⁶ See MUHANNA/WOLF (2002), p. 150.

¹⁸⁷ See Gerstner (2008), p. 119.

¹⁸⁸ See BRASTOW/SPRINGER/WALLER (2011), pp. 1-2.

¹⁸⁹ See GERSTNER (2008), p. 119; AENGEVELT/AENGEVELT (2001), p. 461.

¹⁹⁰ See MICELI/PANCAK/SIRMANS (2000), p. 8.

¹⁹¹ See NOURSE (1992), pp. 139-143.

¹⁹² See RABIANSKI/DE LISLE/CARN (2001), pp. 176-192.

Company representatives determine a set of requirements and selection criteria to select appropriate office properties. (3) Members of the renting center engage in a search for information, evaluate collected exposés, and adapt the initial requirements if necessary. (4) Renting center members visit selected sites and evaluate the offers in more detail. (5) The number of considered office properties is further reduced, and negotiations with the owners of the most preferred sites are initiated. (6) The final office property is selected, and a lease contract is signed. In the course of the procedure, the number of considered offers is successively reduced until an office property is chosen. The author identifies several factors that have an influence on the decision-making process. For one thing, a higher value of the lease in terms of lease costs might lead to an increase in the duration and overall complexity of the leasing decision. By contrast, a higher level of routine in leasing decisions may reduce the time needed for a leasing decision. Similarly, time restrictions induce faster leasing decisions that are less elaborated. Moreover, higher technical complexity leads to an increase in the influence of consultants. Finally, the overall relevance, as well as the occasion and purpose of a leasing decision, may lead to an early involvement of the decision makers in the renting center. Figure illustrates the standard office leasing process.

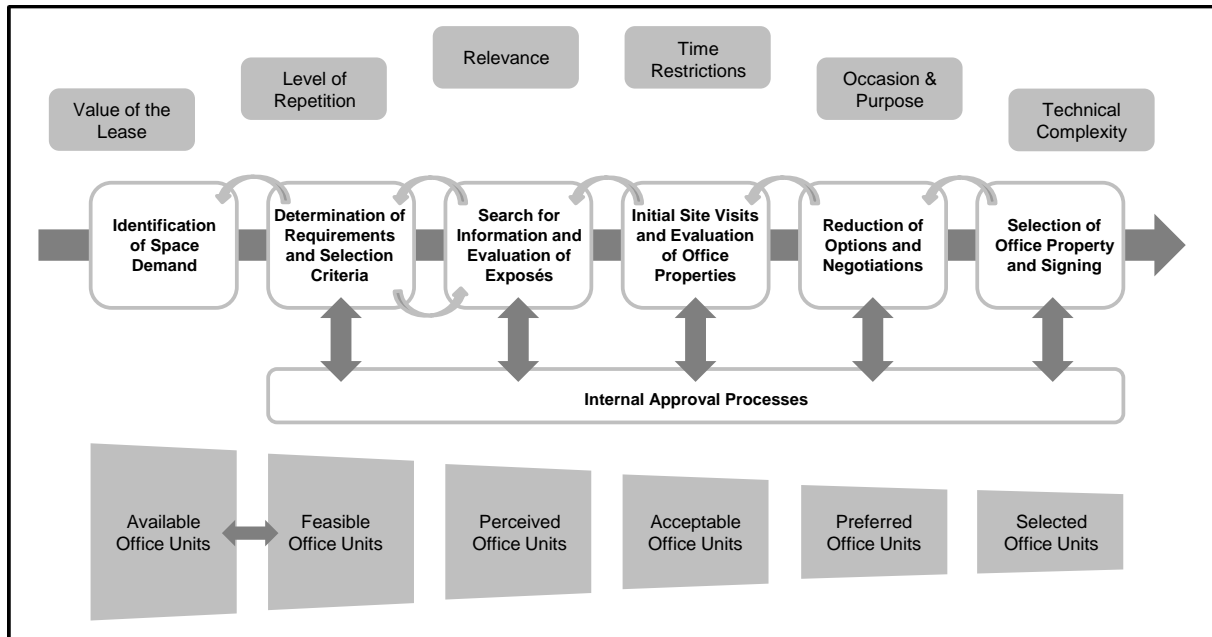
The above considerations have several implications for the role and management of brands in an office property context. Firstly, office leasing decisions can be characterized as organizational buying decisions made by individuals within the framework of a renting center structure. In the course of the leasing process, members of the renting center may have different roles, contradicting interests, and distinct decision criteria for selecting an appropriate office property. In this context, brands can be considered a major tool for achieving a consensus between the members of a renting center when focusing on individuals' perceptions.¹⁹³ In fact, property brands should account for the different roles in a renting center in order to meet each member's requirements. In practice, however, renting center roles cannot be clearly attributed to individuals and might vary across time and situation, thus complicating efforts to address particular members of the renting center.¹⁹⁴ Moreover, the considerations draw attention to real estate agents' role in office leasing decisions. Especially when acting on behalf of the potential tenant, they can have a strong effect on the other members of the renting center and contribute to reducing their perceived risk. Consequently, they might be a prominent target for property marketers.¹⁹⁵ In addition, the literature review showed that leasing decisions are long-term multistage processes in which companies gain knowledge about the available office properties in the market and successively reduce the number of considered offerings. Thus, efforts to establish a property brand in individuals' minds should follow the different steps of the leasing process. In this regard, there are some external factors such as time restrictions or a company's experience with renting decisions that may have an influence on the overall leasing procedure and should also be taken into account.

¹⁹³ See WEBSTER/KELLER (2004), pp. 393-394.

¹⁹⁴ See BINCKEBANCK (2006), pp. 39-40.

¹⁹⁵ In the course of the data collection for the second study in this work, real estate agents were chosen as a surrogate for company representatives due to confidentiality concerns. Their frequent activities as members of companies' renting centers support this step. A detailed discussion of this decision is provided in Section **Fehler! Verweisquelle konnte nicht gefunden werden..**

Figure 4: Standard Office Leasing Process



Source: Gerstner (2008), p. 268.

Altogether, the complexity, duration, and conflicting interests of leasing processes hint at a high level of perceived risk associated with office leasing decisions, which additionally emphasizes the potential relevance of brands in a property context.¹⁹⁶ This notion is also supported when comparing GERSTNER'S (2008) leasing decision model with the characteristics of high-risk decisions suggested in JOHNSTON/LEWIN'S (1996) continuum of perceived risk, which was briefly outlined in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**¹⁹⁷ Consequently, from a brand perspective, establishing a trusted tenant-owner relationship during the leasing process and beyond seems to be of major importance to compensate for the contradicting interests between the two parties.

2.3.2 Current State of Research on Property Brands

This chapter aims at reviewing the current state of the literature in the field of property brands. In the first step, main research streams on brands in the real estate sector are briefly outlined in order to further differentiate property brands from other types of brands. Afterward, the predominant understanding of property brands in the context of strategic and operational real estate marketing is highlighted and discussed critically. Finally, research contributions explicitly focusing on property brands are presented, and their main propositions regarding the likely functions and relevance of brands in an office property context are highlighted.

¹⁹⁶ See BACKHAUS et al. (2013), p. 16.

¹⁹⁷ See JOHNSTON/LEWIN (1996), p. 9.

2.3.2.1 General Literature on Brands in a Real Estate Context

While brands in a property context have been covered in fewer than ten German and international contributions, the general concept of brands as such has already been studied to a slightly larger extent in other settings in a real estate context. In order to further differentiate property brands from other types of brands in the real estate sector, recent publications highlighting the relevance of corporate brands, hotel operator brands, brand effects of corporate buildings, and place brands are briefly outlined in the following.

With regard to the effectiveness of corporate brands in the real estate sector, FAH/CHEOK (2008) found that property purchasers are brand conscious concerning the developer of a property. In particular, the authors state that a property developer's image has an influence on customers' decision making.¹⁹⁸ The practice-oriented work of STEINER/FINK (2009) centers on a Real Estate Brand Potential Index for corporate brands in the real estate sector and additionally highlights the importance of brands for real estate companies.¹⁹⁹ Similarly, VEST (2001) draws attention to favorable functions of corporate brands, such as a reduction in customers' perceived risk, an improved differentiation from competitors, acquisition potentials, enhanced communication effectiveness, and a higher level of negotiation power.²⁰⁰ The three contributions clearly emphasize the value of brands in the real estate industry; however, property brands as such are not in focus.

Several publications have focused on examining brands in the hospitality sector. In this regard, YEILDING/FILDES (2009) identified hotel chain brands as a major success factor for real estate investors.²⁰¹ In the same way, HARVEY (2007) and OLSEN et al. (2005) pointed to the importance of operator brands in hotel real estate management, demanding a consistent fit between the operator brand and the respective building.²⁰² Moreover, ROUBI (2004) highlighted the necessity of including operator brands in the valuation of hotel properties.²⁰³ Clearly, property brands in the sense of this work must be differentiated from this kind of operator brand since their focus is on companies rather than the properties themselves.

Similar to these company-oriented considerations, several studies address the effectiveness of properties as visual cues of an occupier's corporate brand. This perspective is closer to the scope of this work since it concerns the property itself and its function as a brand component. In this regard, MARKWICK/FILL (1995) state that organizations' properties can act as representations of their brand identity.²⁰⁴ More recently, APPEL-MEULENBROEK et al. (2010) observed that companies are convinced of buildings' essential role in their brand strategies.²⁰⁵ Similarly, OMAR/HEYWOOD (2010) and PARK/GLASCOCK (2010) support the importance of brand management in the context of corporate real es-

¹⁹⁸ See FAH/CHEOK (2008), pp. 76-80.

¹⁹⁹ See Section **Fehler! Verweisquelle konnte nicht gefunden werden.** for a detailed discussion of STEINER/FINK's (2009) Real Estate Brand Potential Index concerning their conceptualization of the brand equity construct for corporate brands in the real estate sector.

²⁰⁰ See VEST (2001), pp. 132-133.

²⁰¹ See YEILDING/FILDES (2009), pp. 16-18.

²⁰² See HARVEY (2007), pp. 189-190; OLSEN et al. (2005), pp. 146-148.

²⁰³ See ROUBI (2004), pp. 420-422.

²⁰⁴ See MARKWICK/FILL (1995), pp. 406-408.

²⁰⁵ See APPEL-MEULENBROEK et al. (2010), p. 56.

tate management.²⁰⁶ Finally, PUNJAISRI/WILSON (2007) identify a direct and an indirect brand effect of corporate real estate: On the one hand, buildings directly contribute to the visual identity of their occupiers. On the other hand, they have an indirect influence via their impact on employees' behavior and productivity.²⁰⁷ Clearly, the company-focused perspective of these publications considers properties as components of a corporate brand, whereas this work centers on properties as brands themselves.

Another, more geographical research stream refers to so-called place brands that relate to cities, regions, countries, or tourist destinations and to their competition for visitors, investors, residents, and other resources. In this context, a social and political perspective is the basis for brand management considerations.²⁰⁸ In order to further differentiate this type of brand from other fields of brand management, FREIRE (2009) suggests the term "geo-brands."²⁰⁹ Regarding this, ASHWORTH/KAVARATZIS (2009) point out that in contrast to regular brands from the economic sector that strive for enhanced profitability, place brands aim at the cultural, political, and social development of cities, regions, and countries.²¹⁰ Consequently, as SKINNER (2008) states, it is arguable whether classic brand management approaches can be transferred to this field since places in the sense of cities, destinations, or even countries lack the characteristics of products and services that can be purchased.²¹¹ As a result, findings in the field of place brands can hardly be transferred to the area of property brands. Even if both brand concepts focus on a certain location, they do not share a joint objective. While property brands aim at a property's overall performance, place brands try to enhance the political, cultural, and economic development of cities, regions, or countries.

Altogether, this brief discussion of research contributions covering different perspectives on brands in the real estate sector has demonstrated that a direct transfer of findings from existing research streams to the field of property brands seems impracticable. In particular, company-oriented and place-oriented brand perspectives exhibit a substantially different focus compared to this work.

2.3.2.2 Property Brands in the Context of Real Estate Marketing Literature

Only recently have marketing issues found their way into real estate practice and – to a lesser extent – research. In particular, excess supply on space and investment markets as well as occupiers' changing requirements have contributed to a growing awareness of marketing aspects.²¹² As BRADE et al. (2008) point out, location, architecture, and equipment of a building are no longer sufficient to ensure success in the market.²¹³ Similarly, BONE-WINKEL/ISENHÖFER/HOFMANN (2008) emphasize a comprehensive target group orientation in property development processes.²¹⁴ In the English literature, an early contribu-

²⁰⁶ See OMAR/HEYWOOD (2010), pp. 185-186; PARK/GLASCOCK (2010), p. 11.

²⁰⁷ See PUNJAISRI/WILSON (2007), pp. 67-70.

²⁰⁸ See HOSPERS (2004), pp. 271-272.

²⁰⁹ See FREIRE (2009), p. 422.

²¹⁰ See ASHWORTH/KAVARATZIS (2009), p. 521.

²¹¹ See SKINNER (2008), p. 923.

²¹² See ZIEGLER (2006), pp. 19-21.

²¹³ See BRADE et al. (2008), p. 772.

²¹⁴ See BONE-WINKEL/ISENHÖFER/HOFMANN (2008), p. 260.

tion by MALIZIA (1990) also highlights marketing as an integral component of property development. In the same way, GUY/HARRIS (1997) demand a general shift from a technical and functional view on properties toward a utility orientation.²¹⁵ Newer contributions also demand a stronger integration of real estate marketing into the education of real estate professionals.²¹⁶ For the German market, the practice-oriented magazine *Immobilienwirtschaft* established an annual specialized marketing award in 2003. However, real estate practice is driven mainly by short-term sales-oriented activities, disregarding the potential of a comprehensive marketing concept. Likewise, the majority of contributions on real estate marketing do not go beyond operational recommendations.²¹⁷

Despite a growing awareness of marketing in a property context, property brands have been widely neglected in real estate research. On the contrary, current research streams focus on marketing rhetoric,²¹⁸ factors influencing the duration of marketing efforts to reduce properties' time on the market,²¹⁹ opportunities and limitations of e-commerce tools,²²⁰ pricing issues,²²¹ and the use of green building labels for communication purposes.²²² Additionally, some studies discuss tenant satisfaction and service quality as important objectives of real estate marketing and are aimed at developing comprehensive measurement scales.²²³

The lack of research in the field of property brands might be partially attributable to the limited perspective on brands that has been applied. For instance, in their widely acknowledged conceptual work on real estate marketing, BRADE (2001, 1998) and BRADE et al. (2008) differentiate between (1) a strategic level of real estate marketing, determining the overall direction and objectives, and (2) an operational level, comprising product and service policy, communication policy, distribution policy, and pricing policy as the main elements of the marketing mix for implementing the strategy. In this context, the authors refer to property branding activities as the selection of an appropriate name, claim, and logo for a building and assign those activities to product policy on operational level.²²⁴ From a life cycle perspective, BRADE et al. (2008) assign product policy to the planning, development, and degeneration phases, thus limiting brand management to comparably short periods in a building's economic life, whereas the time of regular usage is excluded.²²⁵

²¹⁵ See GUY/HARRIS (1997), p. 133.

²¹⁶ See BURTON/RUTHERFORD (2007), p. 161; BLACK et al. (2003), p. 85.

²¹⁷ See MATRE (2003), p. 68.

²¹⁸ See ROBERTSON/DOIG (2010); PRYCE/OATES (2008).

²¹⁹ See LIN/LIU/VANDELL (2009); Bond et al. (2007); LIN/VANDELL (2007); ALLEN/FAIRCLOTH/RUTHERFORD (2005).

²²⁰ See ACHARYA/KARGAN/ZIMMERMANN (2010); HENDL/NEVO/ORTALO-MAGN (2009); MUHANNA/WOLF (2002).

²²¹ See LEVY/FRETHEY-BENTHAM (2010); ALLEN/DARE (2004).

²²² See MCALLISTER (2009); D'ARELLI (2008); SHIELDS (2008); VYAS/CANNON (2008); YUDELSON (2008).

²²³ See SEILER/REISENWITZ (2010); SEILER et al. (2008); SEILER/SEILER/WEBB (2006); DABHOLKAR/OVERBY (2005).

²²⁴ See BRADE et al. (2008), pp. 715-775; BRADE (2001), pp. 49-70; BRADE (1998), p. 70.

²²⁵ See BRADE et al. (2008), pp. 719-721. See also the work of ROTTKE/WERNECKE (2008), pp. 211-229 for an in-depth discussion of property life cycles and their implications.

Real estate researchers' awareness of property brands is still limited and clearly lags behind other industry sectors. In particular, the lack of interest seems critical regarding the likely effectiveness of property brands as a means of reducing individuals' perceived risk in property-related decisions, as discussed in previous sections. In the majority, brand management activities are understood as components of the product policy, being mostly operational. As a matter of fact, a property brand is often only considered as the name of a property.²²⁶ Even if the development of a logo, a name, and a claim is recognized as a relevant part of the planning phase in the property life cycle, a strategic perspective on property brands is not common. Consequently, the value of the existing real estate marketing literature is limited for this work except for the notion that branding activities are a part of the overall marketing efforts for a property.

2.3.2.3 Specialized Literature on Property Brands

The literature that specializes on property brands is scarce and highly fragmented. In fact, in a comprehensive literature review covering German and international real estate journals, no contribution was identified that explicitly centers on office property brands.²²⁷ However, two main research streams can be distinguished: On the one hand, there are several contributions that focus on property brands on a general level, independent of their type of use. On the other hand, a number of publications focus on property brands in the field of shopping centers, where the concept of property brands is more widely established than in other sectors of the real estate industry. The latter research stream is only briefly outlined due to its limited applicability to the particularities of office properties, whereas the more general contributions are discussed in more detail since they provide some insights for the purpose of this work.

DIXON/ARSTON (2005) and MEJIA/BENJAMIN (2002) highlight the brand of a shopping center as one of its most decisive success factors. Especially as the number and variety of shopping centers increases, the authors assume that nonspatial factors such as brands gain importance.²²⁸ Similarly, a study by the BRITISH COUNCIL OF SHOPPING CENTRES (2006) covering 23 expert interviews found univocal agreement that brand management is of vital importance for the performance of properties in the retail sector.²²⁹ In this respect, a strategic perspective on brand management throughout the building life cycle and a consistent marketing mix were identified as substantial success factors. Regarding conceptual approaches, KIRCHER'S (2010) writing seems to be the most recent and comprehensive contribution in this field. The author enumerates size, tenant mix, architecture, special attractions, and consistent marketing as main drivers of shopping center brands.

²²⁶ See, for instance, the contributions of HIRSCHMANN (2010), pp. 19-24 and HEIDER (2001), pp. 208-209, which both apply this reduced property brand perspective.

²²⁷ The literature review covered the following real estate journals: *Zeitschrift für Immobilienökonomie*, *Journal of Property Management*, *Journal of Property Research*, *Journal of Real Estate Research*, *Journal of Property Valuation and Investment*, *Journal of Retail & Leisure Property*, *International Real Estate Review*, *Journal of Corporate Real Estate*, *Journal of European Real Estate Research*, *Journal of Real Estate Literature*, *Journal of Real Estate Practice and Education*, *Journal of Sustainable Real Estate*, *Journal of Real Estate Economics*, *Wharton Real Estate Review*, and *International Journal of Strategic Property Management*.

²²⁸ See DIXON/ARSTON (2005), pp. 98-100; MEJIA/BENJAMIN (2002), pp. 4-6.

²²⁹ See BRITISH COUNCIL OF SHOPPING CENTRES (2006), pp. 53-54.

Moreover, KIRCHER (2010) postulates top-of-mind awareness as a major objective and emphasizes the importance of controlling instruments in order to assess a shopping center's brand awareness and brand image.²³⁰ However, the author's argument is based mainly on personal experiences and lacks theoretical and empirical validation.

Obviously, from a brand perspective, there is a major difference between shopping centers and office properties. Shopping centers are generally open to the public and ultimately need to account for end consumers' requirements as a primary objective.²³¹ By contrast, office properties commonly do not need a strong visitor orientation and can center exclusively on the requirements of their occupiers. Consequently, success factors that have been identified for shopping center brands most likely do not apply to office properties.

Regarding property brands on a general level, only three contributions that explicitly focused on property brands were identified: VIITANEN (2004), who builds a basic framework of brand components relevant for the development of property brands; HÄGG/SCHULTZ (2006), who discuss the impact of property brands on companies' shareholder value; and ROULAC (2007), who investigates the influence of property brands on the perceived value of properties. In addition, two German publications covering the topic were found: BRADE et al. (2008), providing some basic considerations on property brand architecture, and MUSSLER (2010), suggesting a concept for a property brand value chain. A critical comparison of the five existing contributions on property brands is hardly feasible owing to their vast differences in objectives and methodology and the fact that they all tap into different facets of property brands. However, they do shed light on a series of substantial aspects, and together they form the existing literature in the field of property brands. For this reason, the work of these authors is subsequently discussed in some more detail.

VIITANEN (2004) provides the most fundamental contribution in the field of property brands. The author suggests an initial concept for analyzing property brands from a tenant's perspective and applies the model in four case studies. Four major interdependent factors are identified as playing a decisive role in the development of property brands: (1) performance, reflecting the premise itself in terms of its physical and operational functionality; (2) location, referring to the specific area of the property; (3) services, as intangible product components accompanying the property; and (4) image, denoting a character of elegance, prestige, and style. Figure illustrates the four dimensions of property brands following the author. On this basis, Viitanen introduces the idea of a scoring tool comprising the four property brand dimensions, which should be operationalized through a set of appropriate indicators. A simple three-point scaling ("good"/"normal"/"bad") is proposed for capturing the relative performance of a subject property brand in comparison to its competitors.²³² Moreover, the author emphasizes that "The real estate where the enterprise is operating signals the company image and brand of the tenant enterprises quite similarly as its own name, logo, or slogan."²³³

From an academic point of view, the author's contribution seems questionable: In general, the suggested model lacks a clear terminology and theoretical foundation. A definition or

²³⁰ See KIRCHER (2010), pp. 43-48.

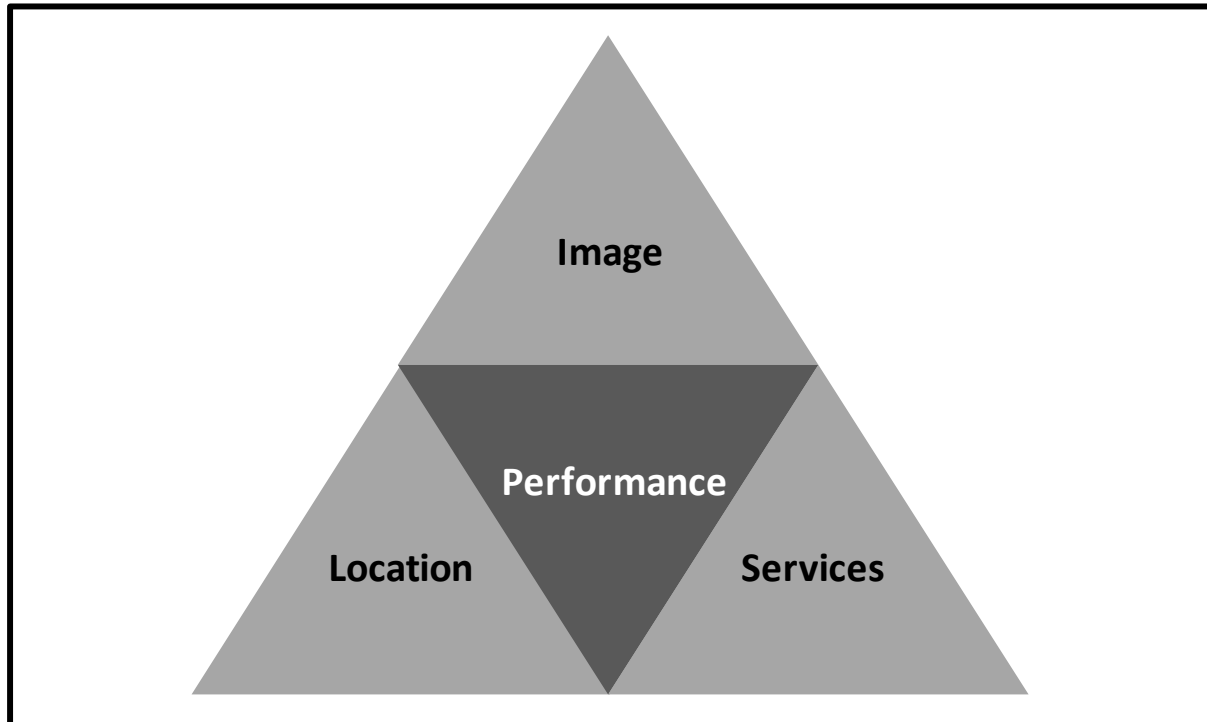
²³¹ See STURM (2006), pp. 34-37.

²³² See VIITANEN (2004), pp. 3-5.

²³³ VIITANEN (2004), p. 5.

description of the brand concept under investigation is not provided. In the same way, the selection and weight of the four property brand dimensions are not documented or theoretically grounded. Still, Viitanen provides a vital contribution to the understanding of property brands pointing at a set of potentially relevant aspects of the phenomenon. Moreover, the importance of a measurement and benchmarking model is emphasized.

Figure 5: Structure of the Brand Concept following Viitanen



Source: VIITANEN (2004), p. 3.

In their mainly conceptual work, HÄGG/SCHEUTZ (2006) discuss how architecture and design of properties can be used to create brands for owners and tenants alike. The authors apply the term “property brand” to buildings with a unique design or location that tend to be “(...) brands in themselves (...)”.²³⁴ According to the authors, the value of a brand generally lies in its ability to maintain and create additional earnings. In this light, they state that property brands’ value is twofold: (1) For commercial occupiers, using the brand of the property in which their office or shop is located can enhance their overall performance. This is particularly the case in shopping centers or for consultants and law firms that tend to lease prestigious properties in order to attract customers and employees. (2) From a property owner’s point of view, HÄGG/SCHEUTZ (2006) compare brands with a franchising system where tenants pay not only for the space as such but also for the brand of the property. The higher the value of the property brand, the higher the rental premium. In order to establish property brands, the authors recommend focusing on the uniqueness of buildings, concerning their exterior and interior appearance or their location.²³⁵

Hägg/Scheutz’s considerations provide insights in the field of property brands in several ways. The authors highlight that property brands provide benefits not only to the owners of

²³⁴ HÄGG/SCHEUTZ (2006), p. 5.

²³⁵ See HÄGG/SCHEUTZ (2006), pp. 4-10.

a brand but also to the tenants. In this respect, the authors also point to the fact that tenants might benefit from renting in a specific property so they can demonstrate the production of their intellectual products in an appropriate environment. Moreover, attention is drawn to the uniqueness of a building's design and architecture as a constitutive characteristic of a property brand.

ROULAC (2007) aims to emphasize brand, beauty, and utility as significant factors of a property's value. The author criticizes common approaches to real estate appraisal and points to a lack of understanding of the sources of properties' actual value. According to ROULAC (2007), an exclusive concentration on technical and functional aspects neglects vital value drivers. The author denotes occupiers' or purchasers' perception of a property as the appropriate focal point of property valuations. Against this background, the price that a property commands in the marketplace is seen as a payment for the sensory experience of its utility, beauty, and brand. Here, utility is defined as a function of a property's design, interior functionality, external functionality, structural quality, access, proximity, and quality of resources; Beauty relates to the architectural detail, the site, its natural features and improvements, and the views; and the brand factor refers to the place brand of the property, that is, the image of the country, region, city, and/or street where the property is located. Based on a survey of graduate students, ROULAC (2007) determines the relative allocation of perceived value among the three components, suggesting brand (46.35%) as the most important component, followed by beauty (29.30%) and utility (24.35%). Additionally, the author states that the higher the property value, the higher is the overall importance of the brand dimension.²³⁶

The author's suggested integration of the brand concept in a property valuation context can be criticized for several reasons. For one thing, the understanding of a property brand as the image of a property's location seems too limited since it does not account for the range of experiences that an individual might have with a brand. In addition, using graduate students as respondents generally limits the study's external validity regarding real estate practice. Despite this criticism, ROULAC's (2007) contribution is of decisive value since it clearly hints at the overall relevance of property brands for the perceived value of a property and encourages further research in this field. Moreover, the author draws attention to the importance of focusing on tenants' (or buyers') perceptions when examining brands in a property context.

As was briefly outlined from a real estate marketing perspective in the previous section, BRADE et al. (2008) consider brand management activities as a part of properties' product policy. In this regard, the authors suggest creating awareness, differentiating from competitors, and implementing an appropriate positioning as major objectives. Moreover, a property brand's overall function is seen in a reduction of occupiers' perceived risk concerning the quality of the subject property and in a labeling that facilitates recognizing a property in the market. BRADE et al. (2008) highlight the importance of brand architecture as a fundamental brand management decision and identify a brand's breadth and height as relevant dimensions: a brand's breadth refers to the amount of properties appearing under one brand in the market, whereas its height is related to the overall quality of the

²³⁶ See ROULAC (2007), pp. 440-444.

branded property in comparison to its competitors. With regard to a property brand's breadth, the authors identify (1) single brands, denoting cases in which only one property is held under a brand; (2) family brands, where a brand comprises more than one property; and (3) umbrella brands, referring to cases where the corporate brand of the owner or developer is the focus instead of a property brand. Concerning property brands' height, BRADE et al. (2008) differentiate between (1) premium brands, aiming at superior quality and a price premium; (2) classic brands, offering standard quality and functionality and thus demanding average prices; and (3) basic brands, referring to properties that fulfill minimum quality requirements in a low price segment. Finally, the authors point to the importance of a property's name and an appropriate logo. In this respect, informative names, names describing architectural particularities of the property, and personifications are emphasized as possible approaches.²³⁷

In general, transferring basic concepts from classic brand architecture to the field of property brands, as proposed by BRADE et al. (2008), seems plausible in order to classify brand structures in the real estate industry. However, denoting corporate brands in the real estate sector as property umbrella brands is questionable for three reasons: For one thing, the overall consistency of the focus on property brands is ruptured by including corporate brands. Secondly, marketing literature in other fields of research has found that corporate brands exhibit a series of specifics in contrast to product-focused brands, leading to different requirements concerning their management.²³⁸ Finally, classifying cases where both the brand of a property and the brand of its owner are prominent in the market seems ambiguous. Altogether, BRADE et al.'s (2008) contribution introduces an initial typology of property brands providing a viable approach to classifying different types of brands in the real estate market. Moreover, the publication highlights brand awareness and uniqueness as key factors in establishing a property brand.

MUSSLER (2010) suggests a schematic brand value chain (MC ImmoBrand – Markenwertkette) that illustrates how property brands can contribute to a property's economic success. The author identifies five consecutive stages leading to a property brand's overall value: (1) strategic planning, referring to the determination of objectives, target groups, brand positioning, brand strategy, and marketing budgets; (2) marketing mix, comprising product, communication, distribution, and pricing policy with a particular focus on the architecture and design of the property; (3) brand capital, consisting of brand knowledge, brand image, uniqueness, trust and sympathy, willingness to purchase or lease, willingness to pay a price premium, and brand attachment;²³⁹ (4) revenue drivers, incorporating vacancy rates, price premium, lease contract periods and termination rates, and the retention of attractive occupier companies and brands; and (5) added value, associated with increased revenues, brand-specific cash flows, reduced cost of capital, and a prolonged life cycle.

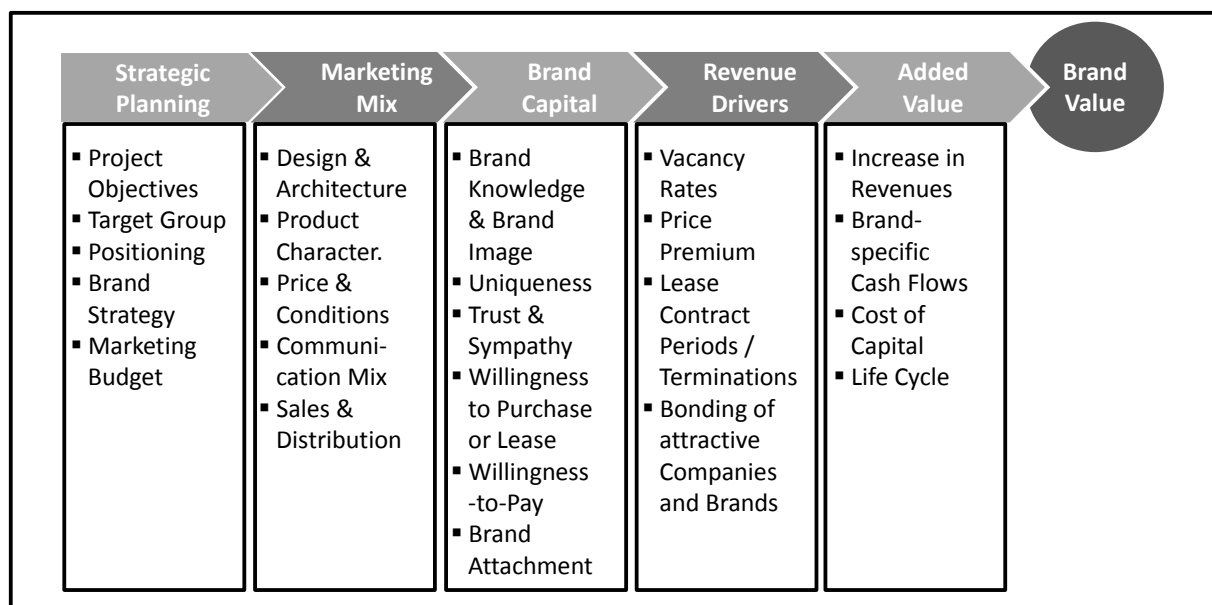
²³⁷ See BRADE et al. (2008), pp. 727-728.

²³⁸ See, for example, ASPARA/TIKKANEN (2008), pp. 44-46 for a discussion of the significance of corporate brands and ESCH/BRÄUTIGAM (2006), pp. 131-138 for an examination of the interaction between corporate and product brands.

²³⁹ Mussler's brand capital concept as a representation of a property brand's representation in individuals' minds apparently relates to the concept of brand equity. For this reason, the author's suggested brand capital dimensions are also briefly discussed from a brand equity perspective in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**

Along this value chain, the author outlines the successive development of a property brand and its effects. Starting from a basic strategic planning of the brand, a set of appropriate marketing instruments is selected. On the basis of a consistent implementation of the brand strategy, the brand gains strength, resulting in a particular level of brand capital in individuals' minds. As a consequence of a property brand's behavioral effects, major revenue drivers are improved and value is added to the property. From a life cycle perspective, the author states that during the planning and construction phase of a property, the creation of awareness and of brand knowledge is of utmost importance in order to foster brand familiarity, desirability, and preference. On the other hand, relationship management is the focus of interest during a property's usage phase to maintain and strengthen the brand capital. The author identifies communication policy as the most flexible and adaptive instrument of the marketing mix throughout the property life cycle.²⁴⁰ Figure provides an overview of the brand value chain.

Figure 6: MC ImmoBrand - Brand Value Chain



Source: MUSSLER (2010), p. 113.

MUSSLER'S (2010) concept of a property brand value chain provides an initial insight into how property brands may contribute to the performance of a property. Moreover, the model has a clear tenant focus, which is also in line with the main orientation in this work. Regarding activities to establish a property brand, the author emphasizes the importance of creating awareness and brand-related knowledge. Moreover, Mussler draws attention to the relevance of a trusted tenant-owner relationship, which should be in focus during a building's usage phase. As a major drawback, one must state that the author did not document the theoretical foundation for the propositions. However, Mussler's suggestions are obviously in accordance with previous considerations on risk theory, brands' representation in individuals' minds, and the particularities of office properties.

Altogether, this section has demonstrated that the current body of knowledge on property brands is limited and highly fragmented. However, there is some consensus regarding the

²⁴⁰ See MUSSLER (2010), pp. 112-114.

overall relevance of property brands, and some major functions of brands in a property context can be derived. Regarding their importance, real estate publications agree that property brands may contribute to a property's overall performance on the basis of a positive influence on individuals' behavior. Concerning the overall effects of property brands, three functions can be identified in a leasing context: (1) risk reduction, as property brands may contribute to reducing individuals' perceived risk in renting decisions;²⁴¹ (2) prestige, as tenants may choose a certain property in order to reflect their own company values;²⁴² and (3) information efficiency, as property brands facilitate recognizing information related to a particular property.²⁴³ However, it must be stated that these propositions are based mainly on anecdotal insights, experiences from real estate practice, and intuitive assessments, thus lacking both theoretical foundation and empirical evidence.

2.3.3 Functions and Relevance of Office Property Brands as Brands in a Business-to-Business Context

In order to substantiate existing presumptions on the potential relevance and functions of brands in an office property context, it seems reasonable to abstract from the fragmentary real estate literature and consider property brands from a business-to-business brand perspective. For this purpose, the main implications from Sections **Fehler! Verweisquelle konnte nicht gefunden werden.** and **Fehler! Verweisquelle konnte nicht gefunden werden.** are now discussed in light of contributions that focus on brand functions and main drivers influencing the relevance of brands in an industrial context. In this way, this section consolidates the considerations from the previous sections and draws a conclusion on the likely relevance of brands in an office property setting.

A growing number of publications center on assessing the relative importance of brands in a business-to-business environment and identifying the main drivers of its relevance. The question of whether brands play a role in this context has long been the subject of controversial debate. The main reasons for this are the assumption that rational criteria dominate organizational buying behavior and the argument that there are only a small number of buyers and sellers in the market, which makes it easy for them to develop knowledge about each other.²⁴⁴ In fact, studies on the relevance of industrial brands have shown mixed results. For some industry sectors, earlier publications in particular identified only a minor role of brands,²⁴⁵ and it was argued that branding in an industrial context might be confusing for customers and adds little value to functional products.²⁴⁶ More recent studies, however, have found evidence for the relevance of brands in business-to-business settings. For instance, MUDAMBI/DOYLE/WONG (1997) held 15 in-depth interviews with organizational buyers of precision bearings and found that intangible product and supplier

²⁴¹ See BRADE et al. (2008), pp. 727-728.

²⁴² See HÄGG/SCHEUTZ (2006), pp. 4-10; VIITANEN (2004), p. 5.

²⁴³ See BRADE et al. (2008), pp. 727-728.

²⁴⁴ See BIEDENBACH/BENGTSSON/WINCENT (2011), p. 1093; KIM/HYUN (2011), p. 424; KOTLER/PFOERTSCH (2007), p. 357.

²⁴⁵ See, for instance, the work of SAUNDERS/WATT (1979) in the man-made fibers industry or SINCLAIR/SEWARD (1988) in the wood and plywood sector.

²⁴⁶ See KUHN/ALPERT/POPE (2008), p. 41.

attributes have an influence on individuals' decision making.²⁴⁷ Equivalently, HUTTON's (1997) examination of organizational buying behaviors regarding office equipment indicated that purchasers had a positive attitude toward extensions of their favorite brand and were willing to pay a premium and recommend the brand to others.²⁴⁸ Similarly, HOMBURG/JENSEN/RICHTER (2006) confirmed in their study in the chemicals, machinery, and electronics industry that brands count among the criteria that are relevant in industrial buying decisions.²⁴⁹ This was also supported by BENDIXEN/BUKASA/ABRATT's (2004) examination in the pump sector, which found that leading industrial brands command a substantial price premium over new, unknown brands.²⁵⁰ In the same way, WALLEY et al. (2007) identified brands as an important decision criterion in the tractor market.²⁵¹ The assertion that brands may contribute to companies' success in an industrial context was also supported by MICHELL/KIND/REAST (2001), who found in a survey among industrial manufacturers that brands were considered to provide competitive marketing benefits compared to unbranded products.²⁵² A direct comparison with brands in the consumer sector was conducted by CASPAR/HECKER/SABEL (2002), who concluded that there are no substantial differences in the overall relevance of brands between the two settings.²⁵³ For the context of this work, the result of ROBERTS/MERRILEES' (2007) study is of particular interest. The authors examined the relevance of brands in a shopping center services environment and found that a shopping center's brand has a significant positive relationship with tenants' willingness to renew their service contracts with the center management. Moreover, the study results imply that brands can contribute to building trust in the people behind the brand and thus may support a valued tenant-owner relationship.²⁵⁴

In light of growing evidence across different industry sectors, one can conclude that meanwhile, researchers have reached a consensus on the applicability of the brand concept in a business-to-business context. However, a hasty conclusion regarding the relevance of office property brands should be avoided. In fact, several authors concede that the importance of brands may widely vary across industry sectors due to the heterogeneity of business-to-business markets and products.²⁵⁵ For this reason, an increasing number of contributions focus on examining potential influencing factors that determine the brand relevance in a specific setting. Consequently, the question for the applicability of the brand concept in an office property setting should be answered in light of those factors.

In this regard, MUDAMBI (2002) emphasizes the level of risk associated with a purchase and the overall relevance of the decision for a company as two major drivers of brand relevance in an industrial environment.²⁵⁶ Similarly, HUTTON (1997) states that purchasers of office equipment tend to rely on well-known brands in situations where they perceive a high level of risk, time pressure, or product complexity. In particular, the author highlights

²⁴⁷ See MUDAMBI/DOYLE/WONG (1997), p. 444.

²⁴⁸ See HUTTON (1997), p. 435.

²⁴⁹ See HOMBURG/JENSEN/RICHTER (2006), p. 290.

²⁵⁰ See BENDIXEN/BUKASA/ABRATT (2004), p. 380.

²⁵¹ See WALLEY et al. (2007), p. 390.

²⁵² See MICHELL/KING/REAST (2001), p. 421.

²⁵³ See CASPAR/HECKER/SABEL (2002), p. 49.

²⁵⁴ See ROBERTS/MERRILEES (2007), p. 412.

²⁵⁵ See FISCHER/VÖLCKNER/SATTLER (2010), p. 823; RICHTER (2007), p. 20; MUDAMBI (2002), p. 531.

²⁵⁶ See MUDAMBI (2002), p. 531.

that individuals' perceived personal risk is a better predictor of their buying behavior than their perception of organizational risk.²⁵⁷ WEBSTER/KELLER (2004) draw attention to the complexity and newness of the buying decision, the number of people involved in the decision, and the duration of the decision process as main factors influencing the relevance of brands.²⁵⁸ This notion is also supported by HOMBURG/JENSEN/RICHTER (2006), who identified the overall importance of the buying situation and its newness as substantial determinants.²⁵⁹ From a product perspective, BROWN (2007) points out that brands are more relevant for intangible goods than for tangibles.²⁶⁰ A more comprehensive approach to examining the relevance of brands in a business-to-business context was brought forward by RICHTER (2007), who considered environment, product, customer, and supplier attributes. On this basis, the author identified several context factors that had a significant influence on the relevance of brands from a manufacturer's perspective. The highest positive relation was identified for the overall importance of the purchase, followed by the newness of the buying situation and the intransparency of the market. Brand relevance was determined to a lesser extent by the strategic importance of quality for both the customer and the supplier, the size of the buying center, the intensity of competition, the level of technological innovation and dynamics in the market, and the size of the manufacturer company. A significant negative relation was found for the level of product complexity.²⁶¹ Building upon the work of FISCHER/HIERONIMUS/KRANZ (2002), CASPAR/HECKER/SABEL (2002) also conducted a comprehensive study on the relevance of brands in a business-to-business environment across several industry sectors. The authors focused mainly on aspects concerning the buying situation, the customer, and the market. However, their contribution stands out against the others as it draws attention to the different functions of brands as sources of their relevance. CASPAR/HECKER/SABEL (2002) point out that the organizational buying decision mainly determines the strength of the different brand functions, which in turn have an influence on their overall relevance. Three main brand functions were identified: (1) reduction of perceived risk, referring to a brand's capability to provide a sense of security and confidence on the basis of continuity and predictability; (2) information efficiency, denoting a brand's potential to consolidate product-related information, support customers in their orientation in the market, and facilitate recognition; and (3) representation, relating to a brand's ability to contribute to self-representation and provide a means of identification. The authors found that reduction of perceived risk and information efficiency play an equally major role in a business-to-business context, whereas representation is only of minor importance. Regarding the underlying drivers of those brand functions, CASPAR/HECKER/SABEL (2002) state that the benefits from reduction of perceived risk depend mainly on the extent of the differences in the quality between brands and the number of persons in the buying center. On the other hand, benefits from information efficiency are driven by the number of suppliers in the market, the complexity

²⁵⁷ See HUTTON (1997), pp. 433-434.

²⁵⁸ See WEBSTER/KELLER (2004), p. 393.

²⁵⁹ See HOMBURG/JENSEN/RICHTER (2006), p. 292.

²⁶⁰ See BROWN (2007), pp. 99-102.

²⁶¹ See RICHTER (2007), pp. 119, 180.

of purchasing decisions, and quality differences between brands. Finally, benefits from the representativeness function are determined mainly by the visibility of the brand usage.²⁶²

It seems the brand functions suggested by FISCHER/HIERONIMUS/KRANZ (2002) and empirically tested by CASPAR/HECKER/SABEL (2002) correspond to the influencing factors that have been emphasized by other contributions in this field. Moreover, this approach also reflects the assumed functions of office property brands identified on the basis of the literature research in Section **Fehler! Verweisquelle konnte nicht gefunden werden.** Against this background, it seems reasonable to refer to these three proposed functions and discuss their applicability in an office property context in order to substantiate the potential relevance of office property brands.

Reduction of perceived risk: The consideration of office leasing processes in Section **Fehler! Verweisquelle konnte nicht gefunden werden.** demonstrated that renting decisions are characterized by a high level of complexity and conflicting interests between the negotiating parties. Equivalently, it was emphasized that few office tenants have a considerable level of real estate expertise and routine in leasing situations, which can only partially be compensated for by involving a real estate agent. Moreover, selecting an appropriate office unit is of high importance for companies as they rely on office space as a support factor that cannot be easily substituted in their own core processes. In addition, the section highlighted that renting decisions have long-term consequences for tenants since they induce an economic, legal, and social relationship with the people owning the building. Members of the renting center often have a double role as users of the property, and thus they are directly affected by the negative consequences of a misguided decision. Similarly, they might lose their reputation if other users are dissatisfied with the selected office property. Altogether, these characteristics strongly suggest that members of the renting center might benefit from the potential of brands to reduce their perceived risk, which in turn implies a corresponding relevance of brands in an office property setting.

Information efficiency: In light of leasing decisions' high level of complexity, the consolidation of property-related information in the form of a brand might facilitate the internal and external communication of the renting center members. Similarly, Sections **Fehler! Verweisquelle konnte nicht gefunden werden.** and **Fehler! Verweisquelle konnte nicht gefunden werden.** emphasized properties' inherent heterogeneity and the lack of transparency in property markets, which can confuse potential tenants and complicate their orientation in the market. However, as pointed out in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, it should be noted that companies try to compensate for their lack of information with the help of real estate agents and consultants or by intensifying their own search for market information. In this way, they might gain a substantial level of market knowledge and become familiar with a range of different office properties that are available in the market. Overall, it can be assumed that potential tenants may benefit from improved information efficiency through brands, although those effects might be limited by the use of third party expertise and extensive search processes.

Representation: Section **Fehler! Verweisquelle konnte nicht gefunden werden.** explicitly emphasized the extraordinary visibility of office properties and drew attention to their

²⁶² See FISCHER/HIERONIMUS/KRANZ (2002), pp. 19-25; CASPAR/HECKER/SABEL (2002), pp. 51-53.

potential interactions with a multiplicity of stakeholders. In particular, they may have a direct impact on public life in their surroundings. In fact, tenant companies can be directly associated with their office properties, which consequently become a part of their own appearance in the market. Moreover, Section **Fehler! Verweisquelle konnte nicht gefunden werden.** highlighted that office properties can cause substantial levels of emotional arousal and excitement, which usually do not apply to other industrial goods. For these reasons, one can conclude that office tenants can benefit from the ability of a brand to represent particular values and provide a platform for identification.

On balance, the above considerations suggest that the brand concept is generally applicable in an office property context and that property brands may fulfill important functions for tenant companies during the leasing decision process and beyond.

2.4 Brand Equity in a Business-to-Business Context

The concept of brand equity is commonly highlighted as the central target and performance measurement parameter in brand building. Since this work aims to examine how strong brands may be built in an office property context, this chapter reviews existing approaches to conceptualizing brand equity in order to derive an initial framework for developing and testing a property brand equity model in the second study of this work. For this purpose, the relevance of the construct from a brand building view is briefly outlined, and the appropriateness of a customer-based brand equity perspective is discussed. Afterward, a set of academic and practical requirements for brand equity models is developed, and selected practice- and research-based approaches are outlined. In the next step, hierarchy-of-effect models are introduced in order to gain an understanding of the potential relationships between the brand equity components. Finally, the review findings are consolidated, and initial conclusions on how to capture customer-based brand equity in a business-to-business context are derived.

2.4.1 Relevance, Perspectives, and Terminology

The previous section emphasized that there is growing evidence for the applicability of the brand concept in a business-to-business context. Thus, companies should strive to develop strong brands in order to be appealing and reach their full potential among their customers.²⁶³ For this purpose, organizations must invest resources in brand building, and appropriate activities that contribute to establishing a strong brand need to be selected and coordinated. Consequently, questions regarding the efficiency and effectivity of respective efforts arise. In particular, BAUMGARTH/DOUVEN (2010), O'SULLIVAN/ABELA (2007), and DOYLE (2000) have pointed to the incessant need to justify investments in brand building measures.²⁶⁴ This holds true especially for the industrial sector, where there have long been doubts about the general relevance of brands.²⁶⁵

²⁶³ See BIEDENBACH (2012), p. 15; M'ZUNGU/MERRILEES/MILLER (2010), pp. 607-608; SIMOES/DIBB (2001), p. 217.

²⁶⁴ See O'SULLIVAN/ABELA (2007), pp. 79-81; DOYLE (2000), p. 299.

²⁶⁵ See BAUMGARTH/DOUVEN (2010), p. 637; BINCKEBANCK (2006), pp. 12-13.

Regarding the management of brand building activities, financial measures such as sales and profit figures that refer to a company's performance on a general level provide only limited guidance due to their historical orientation, short-term perspective, and lack of direct attributability to marketing efforts.²⁶⁶ This criticism led to the development of the brand equity construct as an intangible asset, which is considered a representation of a brand's success in the market and primary objective for establishing strong brands, thus providing focus and direction to all brand-related activities and decisions.²⁶⁷ In 1991, WINTERS stated that there was no widely accepted definition of brand equity.²⁶⁸ More recently, BIEDENBACH (2012) and TRAN/COX (2009) conceded that while the number of approaches for specifying the constructs has increased, a univocal understanding has still not been achieved.²⁶⁹ However, according to YOO/DONTHU (2001), one important consensus underlying a majority of definitions is that brand equity is the incremental value of a product due to the brand name.²⁷⁰ Following the development of different understandings of the construct, two distinct views on brand equity have been established: a financial and a behavioral perspective.²⁷¹

Historically, companies relied on financial information regarding changes in a brand's value as a guiding key figure to coordinate their brand building activities.²⁷² In this context, the financial (or firm-based) brand equity perspective focuses mainly on the monetary potential that can be derived from a brand.²⁷³ "Proponents of the financial perspective define brand equity as the total value of a brand which is a separable asset – when it is sold, or included in a balance sheet."²⁷⁴ In this way, this point of view centers on the premium in prices and sales volume commanded by a successful brand. Typical fields of application for a financial-oriented brand equity evaluation are accounting purposes,²⁷⁵ brand transactions, fund raising, brand licensing, and loss estimations in cases of brand plagiarism. In this regard, a number of methods have been developed to estimate the monetary asset value of a brand. However, the majority of approaches share a common core in trying to separate the added value of a brand from the value of the subject product or the company itself. Here, three different methods have been the focus: (1) a cost approach assuming that brand equity is the amount of money required to reproduce or replace a certain brand, (2) a market approach considering the price of a brand in an open market transaction, and (3) an income approach understanding brand equity as the net present value of all future

²⁶⁶ See MIZIK/JACOBSON (2008), pp. 15-17.

²⁶⁷ See CHRISTODOULIDES/DE CHERNATONY (2010), p. 43; FISCHER/VÖLCKNER/SATTTLER (2010), p. 823; VERBEETEN/VIJN (2010), p. 648.

²⁶⁸ See WINTERS (1991), p. 70.

²⁶⁹ See TRAN/COX (2009), p. 120.

²⁷⁰ See YOO/DONTHU (2001), pp. 2-3.

²⁷¹ See CHRISTODOULIDES/DE CHERNATONY (2010), p. 46; PAPPU/QUESTER/COOKSEY (2007), pp. 728-729; LASSAR/MITTAL/SHARMA (1995), p. 12. BIEDENBACH (2012) remarks that there have been attempts to integrate both perspectives. However, several authors point out that these models should be applied with caution as they might lead to a confusion of the sources and outcomes of brand equity. (See BIEDENBACH (2012), pp. 19-20; SALINAS/AMBER (2009), p. 40; RAGGIO/LEONE (2007), p. 392.)

²⁷² See BIEDENBACH (2012), p. 18.

²⁷³ See KAAS (1990), p. 48.

²⁷⁴ ATILGAN/AKSOY/AKINCI (2005), p. 238.

²⁷⁵ See the work of WAGNER/MUSSLER/JAHN (2005), GERPOTT/THOMAS (2004), and GREINERT (2002) for a detailed discussion of accounting standards for brands.

income streams based on the brand.²⁷⁶ Altogether, the brand equity construct is considered mainly an evaluative measure that covers the economic success of a brand as its final outcome. The value generated for the consumer is not explicitly taken into account. Rather, this aspect is implicitly represented by its outcome, referring to a premium in prices and sales volume.²⁷⁷

A behavioral (or customer-based) perspective on brand equity was initially proposed in the 1980s as a result of insights from the fields of information economics and cognitive psychology focusing on knowledge structures as representations of brands in individuals' minds.²⁷⁸ From this point of view, AAKER (1991) specified that brand equity is "(...) a set of assets and liabilities linked to a brand's name and symbol that add to or subtract from the value provided by a product or service to a firm and/or that firm's customers."²⁷⁹ Similarly, underlining customers' brand knowledge as a core of brand equity, KELLER (1993) referred to brand equity as a result of "(...) the differential effect of brand knowledge on consumer response to the marketing of the brand."²⁸⁰ In other words, brand equity is the result of different responses to marketing activities for a certain brand, in comparison to identical marketing activities for a fictitious brand, caused by brand-related associations stored in individuals' memory. Consequently, these classic definitions link companies' marketing efforts with customers' responses to these activities and suggest brand equity as a moderator between the two.²⁸¹ Overall, customer-based brand equity is a diagnostic measure that allows for deriving conclusions on the underlying reasons for a brand's success. In this way, appropriate recommendations for brand building activities can be developed.²⁸²

A comparison of the two perspectives shows that both approaches have an individual field of application. In a study by PRICEWATERHOUSECOOPERS/SATTTLER (2001), five occasions of brand equity evaluations were highlighted by German managers: brand transactions, brand protection, brand management, brand documentation, and brand financing.²⁸³ Clearly, financial-oriented brand equity sheds light on the overall success of brand management. However, it does not allow for analyzing the underlying sources of a brand's differential effect as it does not reflect upon customers' knowledge and behavior.²⁸⁴ Thus, a financial view on brand equity seems particularly appropriate for transaction purposes, brand protection, brand documentation, and brand financing. By contrast, SATTTLER (2005) stated that contributions centering on brand building and brand equity drivers are clearly

²⁷⁶ See the work of BRANDES/BIESALSKI (2010), BEKMEIER-FEUERHAHN (1998), SIMON/SULLIVAN (1992), and FARQUHAR/HAN/IJIRI (1991) for a comprehensive overview of finance-oriented approaches to brand equity.

²⁷⁷ See LASSAR/MITTAL/SHARMA (1995), p. 12.

²⁷⁸ See CHRISTODOULIDES/DE CHERNATONY (2010), p. 48; KELLER/LEHMANN (2006), p. 745. See also Section **Fehler! Verweisquelle konnte nicht gefunden werden.** for a brief outline of the representation of brands in individuals' mind.

²⁷⁹ AAKER (1991), p. 15.

²⁸⁰ See KELLER (1993), p. 8.

²⁸¹ See BIEDENBACH (2012), p. 19.

²⁸² See ESCH (2008), p. 59.

²⁸³ See PRICEWATERHOUSECOOPERS/SATTTLER (2001) for a detailed recapitulation of the study results.

²⁸⁴ See BIEDENBACH (2012), p. 19.

dominated by a customer-based understanding of the phenomenon.²⁸⁵ Similarly, KELLER (1993) stated that behavioral approaches are suggested whenever a strategy-based motivation is the underlying reason for studying brand equity.²⁸⁶ Thus, considering the propositions from previous research and the objectives of this work, it seems appropriate to apply a customer-based brand equity perspective. In this way, brand equity is examined as being reflected in the knowledge structures in individuals' minds, which allows for analyzing the sources of the intangible asset instead of focusing on its outcomes.²⁸⁷

In a business-to-customer context, numerous studies have found evidence for the effects of high levels of customer-based brand equity. Among others, a positive influence has been identified regarding consumers' preference and purchase intention,²⁸⁸ market share,²⁸⁹ consumer perceptions of product quality,²⁹⁰ shareholder value,²⁹¹ companies' return on equity,²⁹² firm risk,²⁹³ consumers' evaluations of brand extensions,²⁹⁴ consumer price insensitivity,²⁹⁵ and customers' general willingness to pay a price premium and resilience to product harm crisis.²⁹⁶ Consequently, it is a well-accepted fact that brand equity is of high relevance for the successful management of brands in this setting.²⁹⁷ In correspondence with the general skepticism toward the relevance of brands that has long been prevalent in an industrial context,²⁹⁸ there have only been a few contributions that explicitly focus on the effect of high levels of customer-based brand equity. However, a growing number of studies have demonstrated that brand equity leads to similar positive outcomes in a business-to-business as in a business-to-customer setting: Brand equity drives customers' willingness to repurchase a brand, pay a price premium, recommend a brand, and consider brand extensions.²⁹⁹ Moreover, high levels of brand equity are associated with higher levels of trust toward the people behind the brand and an increased quality of the relationship between customer and supplier.³⁰⁰ Finally, a strong business-to-business brand may improve a company's overall market performance.³⁰¹

For this study, the above considerations suggest primarily that a customer-based brand equity perspective is an appropriate approach to examine how strong brands are built in an office property context. In the next step, an appropriate basis for conceptualizing and measuring the construct must be identified.

²⁸⁵ See SATTLER (2005), p. 4.

²⁸⁶ See KELLER (1993), p. 1.

²⁸⁷ See KAPFERER (1992), p. 291.

²⁸⁸ See CHANG/LIU (2009); COBB-WALGREN/RUBLE/DONTHU (1995).

²⁸⁹ See AGARWAL/RAO (1996).

²⁹⁰ See DODDS/MONROE/GREWAL (1991).

²⁹¹ See BICK (2009); KERIN/SETHURAMAN (1998).

²⁹² See KIM/KIM/AN (2003).

²⁹³ See REGO/BILLET/MORGAN (2009).

²⁹⁴ See AAKER/KELLER (1990); RANGASWAMY/BURKE/OLIVA (1993); BOTTOMLEY/DOYLE (1996).

²⁹⁵ See ERDEM/SWAIT/LOUVIERE (2002).

²⁹⁶ See ANSELMSSON/JOHANSSON/PERSSON (2007); DAWAR/PILLUTLA (2000).

²⁹⁷ See BIEDENBACH/BENGTSSON/WINCENT (2011), p. 1093; PARK (2009), p. 15; KELLER/APÉRIA/GEORGSON (2008), pp. 42-44.

²⁹⁸ See Section **Fehler! Verweisquelle konnte nicht gefunden werden..**

²⁹⁹ See RAUYRUEN/MILLER/GROTH (2009); BENDIXEN/BUKASA/ABRATT (2004); MICHELL/KING/REAST (2001); HUTTON (1997).

³⁰⁰ See RAMASESHAN/RABBANEE/HUI (2013); JENSEN/KLASTRUP (2008); ROBERTS/MERRILEES (2007).

³⁰¹ See KIM/CAVUSGIL (2009).

2.4.2 Practice-Based and Research-Based Brand Equity Models

This section provides a review of practice-based and research-based approaches to conceptualizing customer-based brand equity. In the first step, the review scope is briefly outlined, and a set of requirements for brand equity models is developed as a basis for the assessment of existing models. On this basis, several practice-based models incorporating a nonmonetary evaluation of brand equity are outlined. Finally, the section provides an overview of research-based conceptualizations of the construct. In this regard, the widely established approaches of AAKER (1991) and KELLER (1993) are described in more detail as they have been the basis for a majority of later brand equity models.

2.4.2.1 Review Scope and Model Requirements

In the business-to-customer setting, the increasing evidence for the relevance of brand equity has led to a growing variety of approaches to conceptualizing and measuring the brand equity construct. According to BURMANN/JOST-BENZ/RILEY (2009), an estimated amount of more than 300 different models have been developed, which is mainly attributable to intensifying competition between brand consultancies and the growing interest of researchers.³⁰² However, this development has not been paralleled to the same extent in the business-to-business environment.³⁰³ This is reflected particularly in the low proportion of business-to-business companies that comprehensively control their brand building efforts. In a study on German industrial companies, RICHTER (2007) found that only approximately 12% of respondents regularly used brand equity-related analyses to evaluate their brand building success.³⁰⁴ Similarly, BINCKEBANCK (2006), referring to BAUMGARTH (2004), identified only one practice-based and two research-based approaches aiming to capture customer-based brand equity in a business-to-business environment.³⁰⁵ Although the number of respective brand equity models has increased in recent years, the existing body of knowledge is still quite limited compared to the business-to-customer setting.³⁰⁶ Regarding the specific office property context of this work, only the contribution of ROBERTS/MERRILEES (2007) has considered brand equity in a similar context. However, the authors focused on shopping centers and did not explicitly examine the dimensions of the construct in greater detail. By contrast, they mainly focused on specific center management aspects such as empowerment and joint marketing efforts and considered a shopping center's brand as only one predictor of the contract renewal. As a result of the apparent scarcity of brand equity-oriented studies in the business-to-business context, most researchers have built their conceptualizations, measurements, and hypotheses on a combination of existing studies on industrial brand equity and a transfer of findings from the

³⁰² See BURMANN/JOST-BENZ/RILEY (2009), p. 390.

³⁰³ See BAUMGARTH/DOUVEN (2010), p. 641; CHRISTODOULIDES/DE CHERNATONY (2010), p. 43; RÄTSCH/BAZING (2010), p. 670.

³⁰⁴ See RICHTER (2007), p. 172.

³⁰⁵ See BINCKEBANCK (2006), p. 67; BAUMGARTH (2004), pp. 82-86.

³⁰⁶ See BIEDENBACH (2012), p. 4; KIM/HYUN (2011), p. 425; LEEK/CHRISTODOULIDES (2012), p. 107; BAUMGARTH/DOUVEN (2010), p. 637.

business-to-customer field.³⁰⁷ In this regard, VAN RIEL/DE MORTANGES/STREUKENS (2005) stated that "Buyer-based brand equity seems a good starting point to assess industrial brand equity."³⁰⁸ Similarly, LYNCH/DE CHERNATONY (2004) remarked: "With so little research specifically on B2B branding, business-to-customer (B2C) branding models act as a reference point for direction and guidance."³⁰⁹ This is also supported by BAUSBACK (2007), who suggested that a transfer of findings from a business-to-customer to a business-to-business context is unproblematic in the field of brand management as long as the specific characteristics of the industrial setting are taken into account.³¹⁰ Likewise, WIND (2006) stated that "While we do not want to lose the depth that results from focusing on either business or consumer markets, we also need to recognize that the lines are blurring (...)." ³¹¹ Against this background, this work also relies on a combined approach drawing primarily from business-to-business research but supplemented by considerations and propositions from findings from the business-to-customer context that are adapted to the particularities of the industrial context.

In order to critically discuss existing approaches to conceptualizing the brand equity construct, it seems reasonable to develop a set of requirements regarding the overall quality of a model. In this way, existing appropriate conceptualizations can be identified and then employed as a basis for the development of a brand equity model in an office property context. Moreover, the final property brand equity model derived in this work can be assessed, thus allowing for a critical review of its explanatory power and applicability. For this purpose, a comprehensive set of quality criteria is subsequently developed based on a comparison and aggregation of respective contributions by BAUMGARTH (2007), BINCKEBANCK (2006), SATTLER (2005), and ZEDNIK/STREBINGER (2005).

In general, brand (equity) models represent idealized theories of causal dependencies within or between process, structure, or measurement parameters in the field of brand management. In this way, they make a statement referring to the reality of brand management, whose validity underlies spatial and temporal limitations.³¹² Thus, in their comparison of practice-based brand (equity) models, ZEDNIK/STREBINGER (2005) developed a set of academic and practical requirements in order to assess models' overall quality. Regarding academic criteria, the importance of a theoretical foundation of the conceptualization, a sufficient level of precision regarding terminology, limitations, and measurements, and profound empirical validation are highlighted. On the part of practical requirements, the authors relied on the overall importance of the causalities and issues covered by a

³⁰⁷ See, for instance, the contributions of BONDESSON (2012), KALAFATIS et al. (2012), PERSSON (2010), RAUYRUEN/MILLER (2007), ROBERTS/MERRILEES (2007), and BALDAUF/CRAVENS/BINDER (2003).

³⁰⁸ VAN RIEL/DE MORTANGES/STREUKENS (2005), p. 842.

³⁰⁹ See LYNCH/DE CHERNATONY (2004), p. 407.

³¹⁰ See BAUSBACK (2007), pp. 54-55. The author specifically points out that a transfer concerning brand management, market segmentation, target group definition, and brand positioning issues seems uncomplicated. By contrast, differences in customers' perceptions of brands might require adaptations regarding the selection of relevant brand attributes. Moreover, transferring market research processes and market communication activities could be complicated by the specifics of the business-to-business context. This view is also supported by WEBSTER/KELLER (2004), pp. 390-391, 397 and VOETH/RABE (2004), p. 90.

³¹¹ WIND (2006), p. 475.

³¹² Own translation based on ZEDNIK/STREBINGER (2005), p. 16.

certain approach, its comprehensibility, the completeness and detailedness of the procedure documentation, the cost and duration in the case of a model application, and the attributability of respective tasks.³¹³

In a business-to-business context, BINCKEBANCK (2006) developed another set of main requirements concerning brand equity models. Similar to ZEDNIK/STREBINGER (2005), the author emphasized simplicity, accessibility, and cost effectiveness of brand equity conceptualizations. In particular, in a business-to-business environment in which brand management aspects are still not widely accepted, these considerations play an important role. In the same way, modeling approaches should account for the company that stands behind a branded product or service and the personal relationship between customers and salespersons. Moreover, the author pointed to the relevance of acknowledging buying center specifics that apply in organizational decision-making processes. Finally, Binckebanck emphasized taking individual characteristics of different industries into account during the conceptualization process.³¹⁴ These findings are also supported by BAUMGARTH (2007).³¹⁵

A more general set of assessment criteria is provided by SATTLER (2005), who addressed both financial and behavioral conceptualizations of brand equity. As an initial criterion, the author suggested that the validity and reliability of all measurements and conceptualizations should be ensured via empirical studies. In the same way, all measurements should support the overall purpose of brand building by providing insights into causal dependencies and effects of brand equity components. In this regard, the author emphasized that only brand equity facets that have an influence on individuals' brand-specific response, and thus promise to have an economic effect, should be included. In accordance with the other authors, Sattler demanded detailed documentation of the conceptualization procedure and highlighted the importance of simplicity and accessibility. Third parties should be able to comprehend and reconstruct all relevant steps of a brand equity assessment and to derive recommendations for brand management. Likewise, costs and duration of a brand equity evaluation should be in balance with its expected outcomes.³¹⁶ Table summarizes the set of requirements suggested by the authors above.

Table 1: Overview – Brand Equity Model Requirements

Zednik/Strebinger	Binckebanck (supported by Baumgarth)	Sattler
Academic Requirements <ul style="list-style-type: none"> - Theoretical Foundation - Precision of Terminology - Precision of Limitations - Precision of Measurements - Empirical Validation Practical Requirements <ul style="list-style-type: none"> - Importance of the Problem - Comprehensibility - Documentation of Procedure - Cost and Duration - Attribution of Tasks 	<ul style="list-style-type: none"> - Simplicity and Comprehensibility - Cost Effectiveness - Consideration of Company Specifics - Consideration of Personal Relationships - Consideration of Buying Center Specifics - Consideration of Industry Specifics 	<ul style="list-style-type: none"> - Validity and Reliability of Measurements - Focus on Causal Dependencies and Effects - Behavioural and Economical Relevance - Precision of Documentation - Simplicity and Accessibility - Cost and Time Efficiency

³¹³ See ZEDNIK/STREBINGER (2005), p. 18.

³¹⁴ See BINCKEBANCK (2006), pp. 57-58.

³¹⁵ See BAUMGARTH (2007), pp. 85-87.

³¹⁶ See SATTLER (2005), pp. 5-6.

Source: Own illustration.

In order to balance the partially conflicting interests of researchers and practitioners, ZEDNIK/STREBINGER's (2005) categorization of academic and practical issues seems appropriate for the subsequent selection and consolidation of the quality criteria. A comparison of the different sets of requirements identifies several criteria that are commonly highlighted by the authors. Regarding academic requirements, the theoretical foundation and empirical validation of the theoretical construct and its components is in focus. In this way, the appropriateness of suggested brand equity dimensions and their measurements should be ensured. Equivalently, the group of authors demands precise definitions of all elements in a brand equity model. Moreover, specific limitations of a model concerning its applicability should be considered and communicated openly. Finally, the whole development process should be documented in detail in order to enable other researchers to reconstruct and enhance the conceptualization approach. With respect to practical requirements, the authors univocally request high levels of accessibility and simplicity of brand equity models. In this way, practitioners can easily comprehend and apply brand equity conceptualizations and may derive useful insights and recommendations for their field of interest. In addition, costs and duration of brand equity assessments must be justifiable with regard to their outcome. At this point, SATTLER's advice to focus on brand equity components that exhibit an influence on individuals' brand-specific response might provide guidance to develop sufficiently parsimonious models. Against this background, an aggregated set of requirements for the conceptualization and measurement of the brand equity construct was developed and applied in the further proceedings of this work. Table summarizes the final set of requirements.

Table 2: Final Requirements for Brand Equity Models

Academical Requirements	Practical Requirements
<ul style="list-style-type: none"> - Theoretical Foundation - Precision of Terminology - Precision of Limitations - Documentation of Procedure - Empirical Validation 	<ul style="list-style-type: none"> - Comprehensibility and Accessibility - Cost Efficiency - Time Efficiency - Behavioral/Economic Relevance

Source: Own illustration.

2.4.2.2 Practice-Based Brand Equity Models

The ongoing development of brand management tools in the consulting industry has led to an ever-growing number of practice-based approaches to conceptualizing the brand equity construct. Consequently, it seems reasonable to limit this review to a set of models that share the overall focus and objectives of this work and for which a sufficient level of information is available. From the literature review in the field of real estate brands, the Real Estate Brand Potential Index (Premise Brand+/MPG Solutions) was identified as the only customer-based and industrial-oriented brand equity model in a German real estate context so far. Referring to BAUMGARTH/DOUVEN (2010) and BINCKEBANCK (2006), two approaches that specifically address the particularities of a business-to-business setting

were found: the DLG-Image-Barometer (Deutsche Landwirtschafts-Gesellschaft e.V.)³¹⁷ and MARKET-Q (Baumgarth & Baumgarth Brandconsulting)³¹⁸. ZEDNIK/STREBINGER's (2005) comprehensive contribution on brand models provided another point of reference. The authors described, categorized, and discussed 48 practice-based tools ranging from qualitative positioning models to brand communication models. In particular, they specified a cluster of brand equity-oriented approaches and a group of quantitative brand positioning models that center primarily on customers' perceptions of a brand.³¹⁹ On this basis, Equity* Builder (Ipsos-ASI), the Brand Iceberg (Icon Added Value), the Brand Potential Index (GfK-Marktforschung), and the BrandAsset Valuator (Young & Rubicam) were identified as four models that directly refer to a nonmonetary assessment of brand equity from a customer perspective. Moreover, three additional approaches were selected as they have a strong customer-based brand equity component or demonstrate a high level of conceptual proximity but do not aim exclusively at a nonmonetary assessment of a brand or include information beyond customers' perceptions: the Brand Equity Evaluator (BBDO Consulting), the Brand Performance System (A.C. Nielsen/Konzept & Markt), and the Brand Equity Engine (Info Research International). Figure on Page 57 provides an overview of the selected models and their similarity to the objectives and focus of this work. Subsequently, the seven first-mentioned approaches that exhibit the largest overlap with the context and objectives of this work are outlined and discussed in more detail. Additionally, the latter three approaches are briefly described and assessed regarding the set of academic and practical model requirements.^{320,321}

Premise Brand+/MPG Solutions: Real Estate Brand Potential Index: Only recently, Premise Brand+/MPG Solutions developed the Real Estate Brand Potential Index in order to assess the emotional brand value of corporate brands in the real estate industry.³²² Building upon knowledge, quality, positioning, and identity as primary dimensions of emotional brand value, the developers compiled a set of 17 criteria that they assumed are considered in purchase decisions by organizational buyers. In a preliminary study, these dimensions were rated in terms of their subjective relevance. Finally, an online survey was carried out covering brands from different sectors of the real estate industry, which were evaluated according to this set of brand value drivers. For this purpose, every assessment criterion was captured in a single closed-end question. On this basis, several ratings were deducted concerning brands' overall awareness, their total emotional brand value score, and their strengths and weaknesses concerning the different brand equity dimensions. Finally, a matrix was generated to compare the relative relevance of the assessment criteria

³¹⁷ See BINCKEBANCK (2006), p. 65.

³¹⁸ See BAUMGARTH/DOUVEN (2010), pp. 647-653.

³¹⁹ See ZEDNIK/STREBINGER (2005), pp. 68-75.

³²⁰ See also the work of ZEDNIK/STREBINGER (2005), FRAHM (2004), and SCHIMANSKY (2004) for an in-depth analysis and comparison of practice-based brand equity conceptualizations and brand management models. In particular, the study of ZEDNIK/STREBINGER (2005) sheds light on underlying assumptions and drawbacks and sets up a comprehensive typology of approaches.

³²¹ All German terms regarding model components and indicators were translated by the author.

³²² The term *emotional brand value* seems to be used by the authors as an illustrative description of brand equity following a behavioral perspective.

and brands' respective score.³²³ With regard to the set of academic requirements, some strengths and weaknesses of the model can be identified: Concerning its overall transparency, the model stands out from the majority of practice-based brand equity conceptualizations since the developers provide insights into the development procedure and the final assessment questionnaire. However, the initial selection of the brand equity dimensions and coherent indicators remains undocumented. Moreover, the model lacks empirical validation concerning the consistency of the brand equity drivers and their interdependence. Finally, potential limitations of the model are not discussed. On balance, the model sheds some light on the possibility to conceptualize brand equity for corporate brands in a real estate context. Nevertheless, this approach suffers from the absence of a thorough theoretical foundation and empirical validation.

Despite its obvious proximity to the objectives and context of this work, the model is of only limited value as a point of reference. In addition to the obvious drawbacks from an academic point of view, the approach explicitly refers to corporate brands and does not relate to property brands. However, its business-to-business and real estate focus allows for deriving brand equity components that might be of relevance in a property context. In particular, the authors draw attention to aspects representing customers' relationship with the brand (e.g., trustworthiness, credibility, sympathy), the perceived quality of products and services (e.g., competence, service, value for the money), and a brand's salience (brand awareness, relevant set).

Figure on Page 58 summarizes the brand equity components and indicators as suggested by the model.

Against the derived set of brand equity model requirements, the Real Estate Brand Potential Index fulfills a range of practical aspects: The suggested conceptualization of brand equity seems accessible and the brand assessment procedure appears feasible at an adequate cost and time level. All results of the brand evaluation seem illustrative and can be presented in a comprehensible manner providing an overview of a brand's status. However, it must be argued that the model has yet been applied in only one practice-oriented survey. A major drawback is the fact that the behavioral and economic relevance of the brand equity dimensions have not been considered by the authors. For this reason, the overall explanatory power and practical relevance of the model seems unclear.

Figure 7: Overview of Selected Practice-Based Brand Equity Models

³²³ See STEINER/FINK (2009), pp. 169-179 for an outline of the model.

	Focus on Real Estate Context	Focus on Business-to-Business Context	Exclusive Focus on Non-Monetary Assessment	Exclusive Focus on Customer Perceptions	Exclusive Focus on Brand Equity
Real Estate Brand Potential Index	●	●	●	●	●
DLG-Image-Barometer		●	●	●	●
MARKET-Q		●	●	●	●
Equity* Builder			●	●	●
Brand Iceberg			●	●	●
Brand Potential Index			●	●	●
BrandAsset Valuator			●	●	●
Brand Equity Engine				●	●
Brand Equity Evaluator					●
Brand Performance System					●

Source: Own illustration.

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Figure 8: Premise Brand+/MPG Solutions: Real Estate Brand Potential Index

³²⁴ In particular, a study by VAN RIEL/DE MORTANGES/STREUKENS (2005) on brand equity in a business-to-business context differentiates between corporate brand equity and product brand equity as two distinct constructs. See VAN RIEL/DE MORTANGES/STREUKENS (2005), p. 844.



Source: STEINER/FINK (2009), p. 171.

Deutsche Landwirtschafts-Gesellschaft e.V.: DLG-Image-Barometer: The DLG-Image-Barometer is a benchmark tool for companies in the German agricultural sector. On an annual basis, approximately 400 farmers are interviewed regarding the overall image (50% index weight), innovativeness (30%), advertisement (10%), and web presence (10%) of suppliers in the fields of technology and farm inputs, plant health and seeds, and renewable energies. The respondents are asked to name up to five companies for each category and attribute in a free-elicitation procedure. On this basis, an overall index is calculated for each supplier.³²⁵

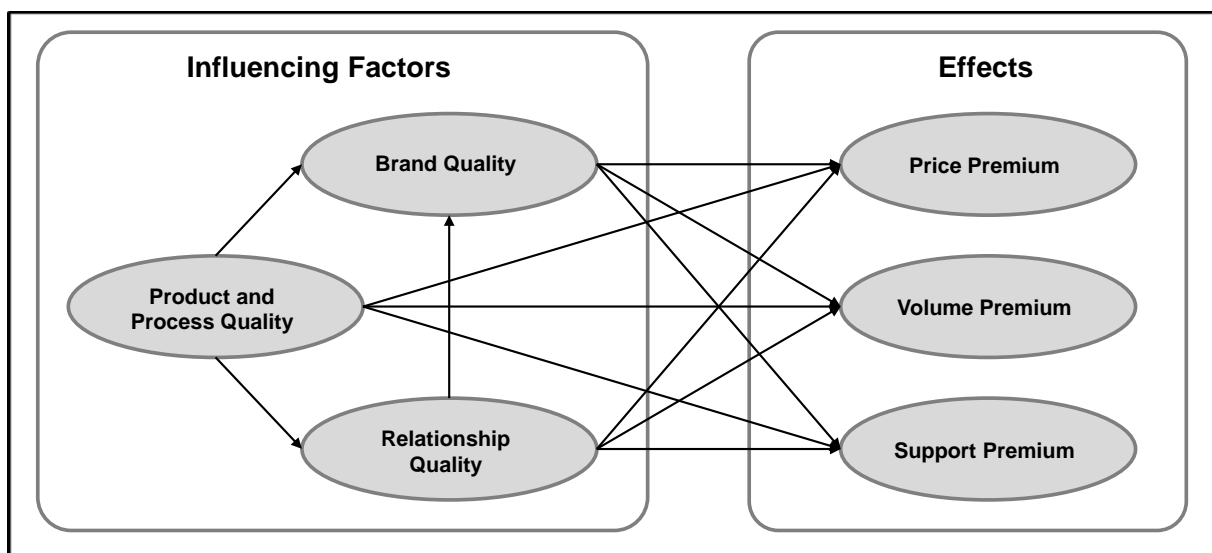
Regarding the practical requirements, one can state that the approach is simple, easily accessible, and cost and time efficient due to its reduced set of indicators. Moreover, the longitudinal character of the DLG-Image-Barometer enables marketers to examine the development of a brand's strength over time. Nonetheless, the model must be criticized as the selection and weighting of the dimensions seems arbitrary and no evidence for their behavioral relevance is provided. Likewise, the development procedure and theoretical foundation are not documented and limitations are not discussed.³²⁶ Against this background, and considering the industry-specific nature of the model, the applicability of this approach as a reference point for this study is highly limited.

³²⁵ See DEUTSCHE Landwirtschafts-GESELLSCHAFT E.V. (2013), p. 80 and BINCKEBANCK (2006), p. 67 for a description of the model.

³²⁶ This assessment is also supported by BAUMGARTH (2004), p. 83 and BINCKEBANCK (2006), p. 67.

Baumgarth & Baumgarth Brand Consulting: MARKET-Q: The MARKET-Q model is a brand controlling instrument that links customers' perception of a brand with their brand-related responses.³²⁷ The approach considers three sources of brand equity: (1) product and process quality, referring to customers' perception of industry-specific functional attributes of the brand; (2) relationship quality, related to perceptions of attachment, credibility, competence, and reliability; and (3) brand quality, associated with sympathy, uniqueness, risk reduction, trust, and perceived quality. In addition, the model contains three outcome variables: (1) price premium, referring to customers' willingness to pay more for a branded product; (2) volume premium, denoting the willingness to buy greater amounts or more frequently; and (3) support premium, describing customers' willingness to recommend the brand and engage in cooperative behaviors. The variables are measured with the help of individual item sets, and the relations between the constructs are estimated using structural equation modeling in order to draw conclusions on the relative importance of the influencing factors.³²⁸ Moreover, a brand's overall scores in the different variables can be visualized in order to derive an overview of its strengths and weaknesses. Figure illustrates the constructs of the model and the relationships between them.

Figure 9: Baumgarth & Baumgarth Brand Consulting: MARKET-Q



Source: BAUMGARTH/DOUVEN (2010), p. 647.

By integrating a causal relationship between the brand equity components and several positive effects, the model obviously fulfills the practical requirement for behavioral relevance of its elements. Moreover, the relatively limited number of constructs promises an appropriate level of accessibility. In particular, the model stands out due to its theoretical foundation and documentation, which is outlined in several publications.³²⁹ Nonetheless, it must be stated that only limited information is available regarding the concrete measurements of the variables, and the authors provided no detailed advice on how to adapt the

³²⁷ See BAUMGARTH/DOUVEN (2010), pp. 646-652 for an outline of the model.

³²⁸ See Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.** for an outline of structural equation modeling in general and a more in-depth discussion of the partial least squares approach.

³²⁹ See, for instance, DOUVEN/BAUMGARTH (2008), pp. 187-208; BAUMGARTH (2008), pp. 41-57.

model to the specifics of a particular product category or company setting. From a practical point of view, the data collection might require considerable resources. Finally, the high number of relations between the constructs might complicate an interpretation from a practitioner's perspective.

The model provides valuable insights for the development of a brand equity model in an office property context. In particular, the approach emphasizes that brand equity dimensions are not necessarily independent of each other but might follow a chain of effects. Moreover, the MARKET-Q model highlighted the importance of integrating outcome-oriented variables that represent favorable effects of brand equity in order to ensure behavioral relevance and draw conclusions regarding the individual relevance of the brand equity components. In this regard, the approach additionally draws attention to the relevance of relationships and quality perceptions in a business-to-business context.

Ipsos-ASI: Equity Builder:* The Equity* Builder links brand equity, price/value perceptions, and customers' product category involvement as independent variables with an overall brand health score that relates to brand loyalty, commitment, purchase intent, price sensitivity, and a brand's market performance. In this context, brand equity is referred to as individuals' overall attitude toward the brand reflected in perceptions of familiarity, uniqueness, relevance, popularity, and quality. Based on the correlations between the three independent variables and the brand health score, the model determines the specific importance of the influencing factors. In the next step, the different brand equity components can be linked to advertisement activities in order to derive recommendations on how to enhance a brand's brand equity and, ultimately, brand health score.³³⁰

From a practitioner's point of view, the limited number of variables contributes to the model's accessibility and comprehensibility. Moreover, the requirement for behavioral relevance seems to be fulfilled due to the assumed causal relation between the brand equity components and customers' brand-related responses reflected in the brand health score. Time and cost efficiency can hardly be assessed since there are no details available regarding the number of items or the data collection procedure. Similarly, the theoretical foundation of the model and its development are not documented. Finally, the model claims to be applicable across industry sectors and target groups on the basis of a "(...) handful of standardized attitude measures (...),"³³¹ which seems questionable regarding the vast differences in individuals' buying behaviors across product categories.

Nonetheless, the model provides some valuable insights for this work. For one thing, the approach again emphasizes the usefulness of incorporating an outcome variable in order to examine the individual relevance of brand equity components. For another, the model highlights several facets of customers' brand perceptions, such as familiarity, uniqueness, and relevance, that might be considered in brand equity context.

³³⁰ See ZEDNIK/STREBINGER (2005), pp. 135-138 and IPSOS-ASI (2002), pp. 1-5 for an outline of the model.

³³¹ IPSOS-ASI (2002), p. 1.

Icon Added Value: Brand Iceberg: The Brand Iceberg model splits the brand equity construct into two main dimensions that build upon each other: (1) Brand Iconography and (2) Brand Credit. The short-term oriented Brand Iconography (the upper part of the iceberg) describes the evaluation of a brand's appearance in the market by its target groups. This dimension comprises overall brand awareness, subjective communication pressure, memorability of advertisements, brand uniqueness, and the clarity and attractiveness of a brand's mental image in stakeholders' minds.³³² On the other hand, Brand Credit (the lower part of the iceberg) reflects long-term aspects of brand equity, such as brand sympathy, brand trust, and brand loyalty.³³³ According to the Brand Iceberg model, all brand activities have an impact on a brand's appearance in the market, leading to a direct and short-term influence on the Brand Iconography. However, changes in Brand Credit are a long-term task, requiring the ongoing and consistent establishment of a favored market appearance. In the brand assessment procedure, a subject brand is evaluated with the help of a scoring model referring to the dimensions outlined above. The results are subsequently compared with the scores of other brands in order to determine the relative position of the brand under investigation. Figure illustrates the applied conceptualization of brand equity.

In contrast to the majority of practice-based approaches, the Brand Iceberg has been validated empirically several times. In this regard, a study of ANDRESEN/ESCH (2001) provided useful insights concerning the model's validity and the behavioral relevance of its components. In their contribution, the authors identified a significant influence of Brand Iconography on Brand Credit. Moreover, they found support for a positive effect of Brand Credit on purchase rates and highlighted the overall relevance of the clarity and attractiveness of mental brand images.³³⁴

Considering the set of requirements for brand equity models developed above, the Brand Iceberg shows clear strengths and weaknesses. From a practical perspective, the conceptualization of the construct seems particularly illustrative. Together with a manageable effort concerning cost and time, this potentially drives its overall applicability. Moreover, empirical investigations have proven that the dimensions exhibit behavioral and economic relevance. With regard to academic requirements, the model clearly benefits from its empirical validation. Nevertheless, its theoretical foundation, the precision of its terminology, and the communication of its limitations demonstrate some deficiencies. Icon Added Value does not provide details on the concrete operationalization of the brand equity dimensions or the procedure of brand assessments. Moreover, the two main dimensions comprise a relatively high number of aspects, which might affect the model's accessibility and increase the data collection efforts required.

The model offers several points of reference for this work. In particular, the Brand Iceberg emphasizes a causal relationship between the brand equity components and draws attention to the potential importance of short-term perception-based and long-term relationship- and attitude-based facets of the construct. Moreover, the approach highlights the appro-

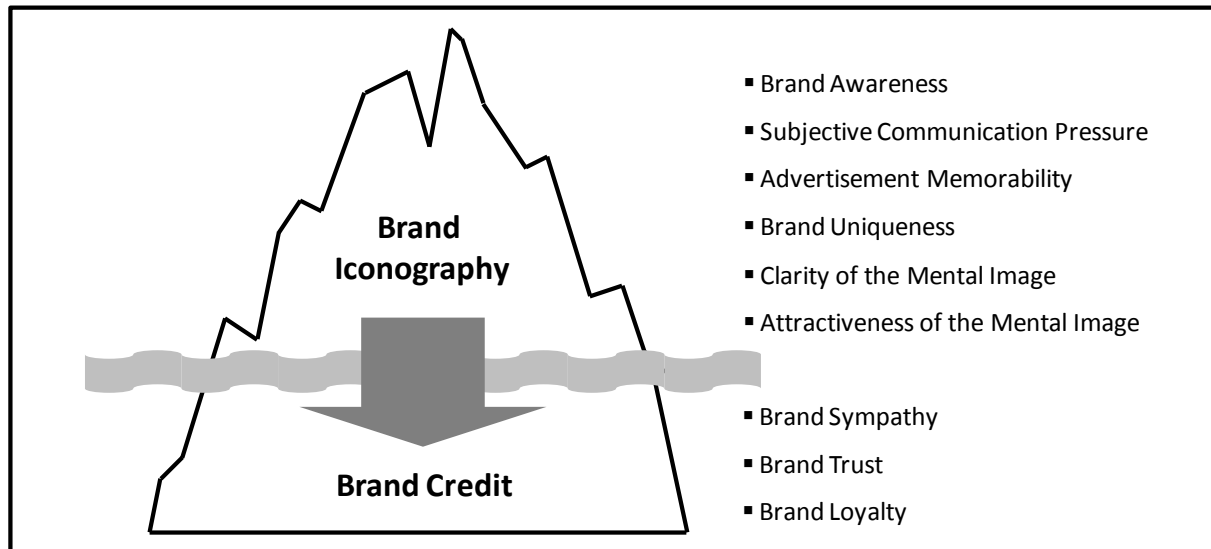
³³² See Section **Fehler! Verweisquelle konnte nicht gefunden werden.** for a brief discussion of mental images as representations of brands in customers' minds.

³³³ See ZEDNIK/STREBINGER (2005), pp. 125-127; a detailed description of the Brand Iceberg is also found in MUSIOL et al. (2004), pp. 370-399.

³³⁴ See ANDRESEN/ESCH (2001) pp. 1081-1103 for an outline of the complete study.

priateness of mental images as a method to capture individuals' brand-related knowledge. Regarding potential dimensions of brand equity, the Brand Iceberg primarily suggests customers' brand awareness, brand associations, brand trust, and brand loyalty.

Figure 10: Icon Added Value: Brand Iceberg



Source: ESCH (2008), p. 639.

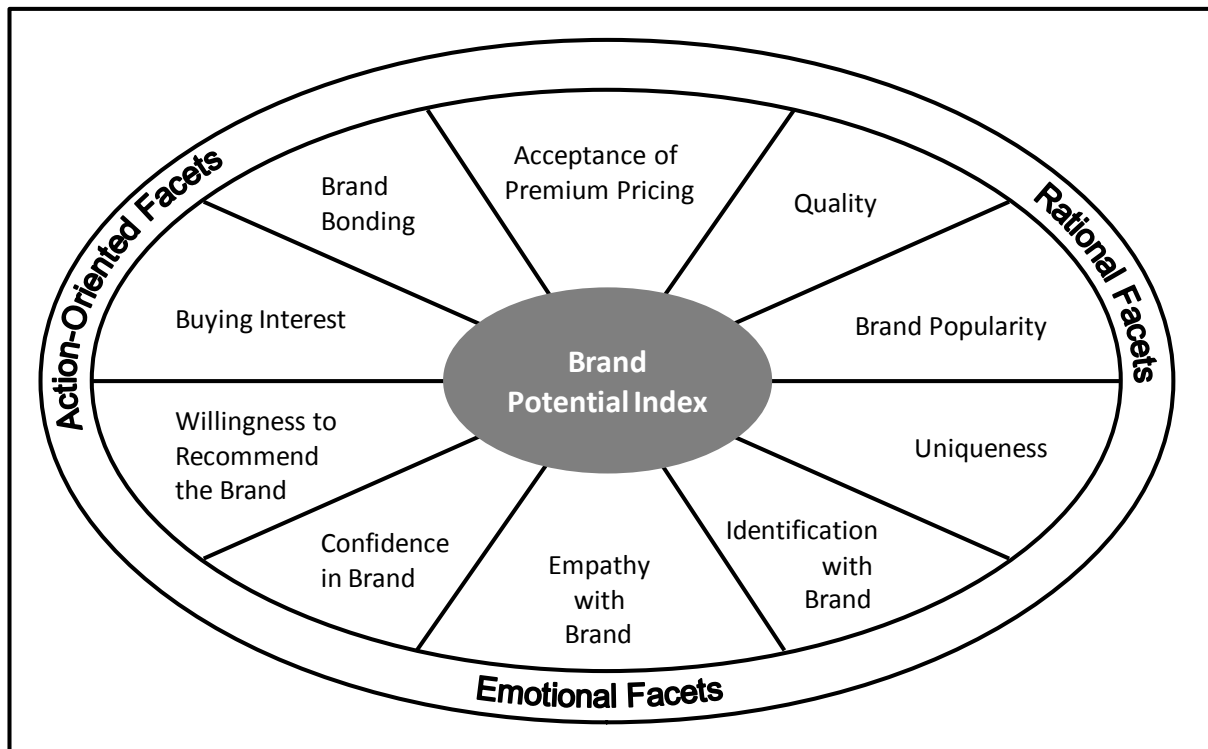
GfK-Marktforschung: Brand Potential Index: The Brand Potential Index, which is usually applied in the course of a comprehensive brand analysis in combination with other brand management tools, focuses on target groups' attitudes and motivations. For this purpose, the model is aimed at assessing individuals' esteem of a certain brand, the brand attractiveness. In this approach, brand equity is conceptualized with the help of ten dimensions covering three different facets of the construct: (1) emotional facets, comprising brand confidence, empathy, and individuals' level of personal identification with the brand; (2) rational facets, including the perceived uniqueness of the brand, its overall popularity, and the quality of the underlying products and services; and (3) action-oriented facets, referring to the willingness to recommend the brand to others, the interest to buy the brand, the bond toward it, and the acceptance of a price premium. A brand is evaluated with regard to these dimensions on the basis of a customer survey. Afterward, all results are aggregated in a final Brand Potential Index score that can be used in benchmarkings against competitors. Moreover, a brand's individual strengths and weaknesses are reflected in the dimensions' parameter values, providing a basis for further analyses. In this way, the influence of specific marketing activities can be investigated in order to develop recommendations on the selection and design of brand management activities.³³⁵ Figure summarizes this model.

The Brand Potential Index was empirically tested in a study by GRIMM/HÖGL/HUPP (2000). In their work, the authors used a confirmatory factor analysis for the brand equity dimen-

³³⁵ See ESCH (2008), pp. 634-636; ZEDNIK/STREBINGER (2005), pp. 173-178.; for a detailed review of analysis tools related to the Brand Potential Index, see also HÖGL/HUPP (2004), pp. 124-145.

sions of the model across various industries and products. On this basis, the validity and reliability of the construct's components and their measurements were confirmed. Moreover, in a regression analysis, significant positive relations were found between the Brand Potential Index score of a particular brand and its future market share and price premium.³³⁶

Figure 11: GfK-Marktforschung: Brand Potential Index



Source: HÖGL/HUPP (2003), p. 8.

Regarding the criteria set, the Brand Potential Index demonstrates a number of advantages concerning academic requirements: All dimensions included in the brand equity conceptualization can be traced back to existing studies on the construct and follow a clear terminology. The model was tested empirically and its different aspects validated in an independent study. However, the accessible documentation could be more detailed, and possible limitations of the model should be discussed openly by the developers. In particular, there is no information available on the concrete operationalizations of the different brand equity dimensions, a fact that complicates a correct reconstruction of the model. Moreover, ESCH (2008) states that aggregating the dimensions in a single score might be questionable as they are not independent of each other.³³⁷ Regarding the series of practical requirements, the dimensions of the Brand Potential Index obviously have predictive power regarding a brand's future market performance. Taking into account the request for cost and time effectiveness and sufficient comprehensibility, the model's complexity imposes high demands on data collection and analysis. While the initial scoring of a subject brand in accordance with the brand equity dimensions seems relatively simple,

³³⁶ See GRIMM/HÖGL/HUPP (2000), pp. 8-12.

³³⁷ See ESCH (2008), p. 636.

all further investigations with the help of causal analysis call for profound knowledge of statistical methods.

Despite its drawbacks, some useful insights can be derived from this model regarding the conceptualization of brand equity. The model underlines that brand equity might comprise rational, emotional, and conative elements. More specifically, the Brand Potential Index puts emphasis on customers' relationship with the brand and their perceptions of differentiating attributes such as quality, uniqueness, and popularity.

Young & Rubicam: BrandAsset Valuator: The BrandAsset Valuator is based on international customer surveys covering approximately 350,000 respondents and 19,500 brands.³³⁸ The model suggests a two-dimensional conceptualization of brand equity: Brand Strength as a measure of the ability to differentiate from competitors in the market and develop relevance in the eyes of the target groups, and Brand Stature as a reflection of stakeholders' esteem of and familiarity with the brand. Brands under investigation are assessed regarding these dimensions, and their strategic position is illustrated in a two-dimensional matrix in order to derive strategic options for brand management. The BrandAsset Valuator differentiates between four strategic positions: (1) new or unfocused brands with a low differentiation, esteem, and familiarity that need a comprehensive brand building process; (2) brands with unrealized potential, possessing high credit in a niche market that might be spread by concentrating on brand awareness campaigns; (3) brands in a leadership position that should be protected against erosion; and (4) eroding brands with diminishing potential, characterized by a decreasing differentiation in the market and calling for creative and individual communication activities.³³⁹ Figure illustrates the brand positioning matrix.

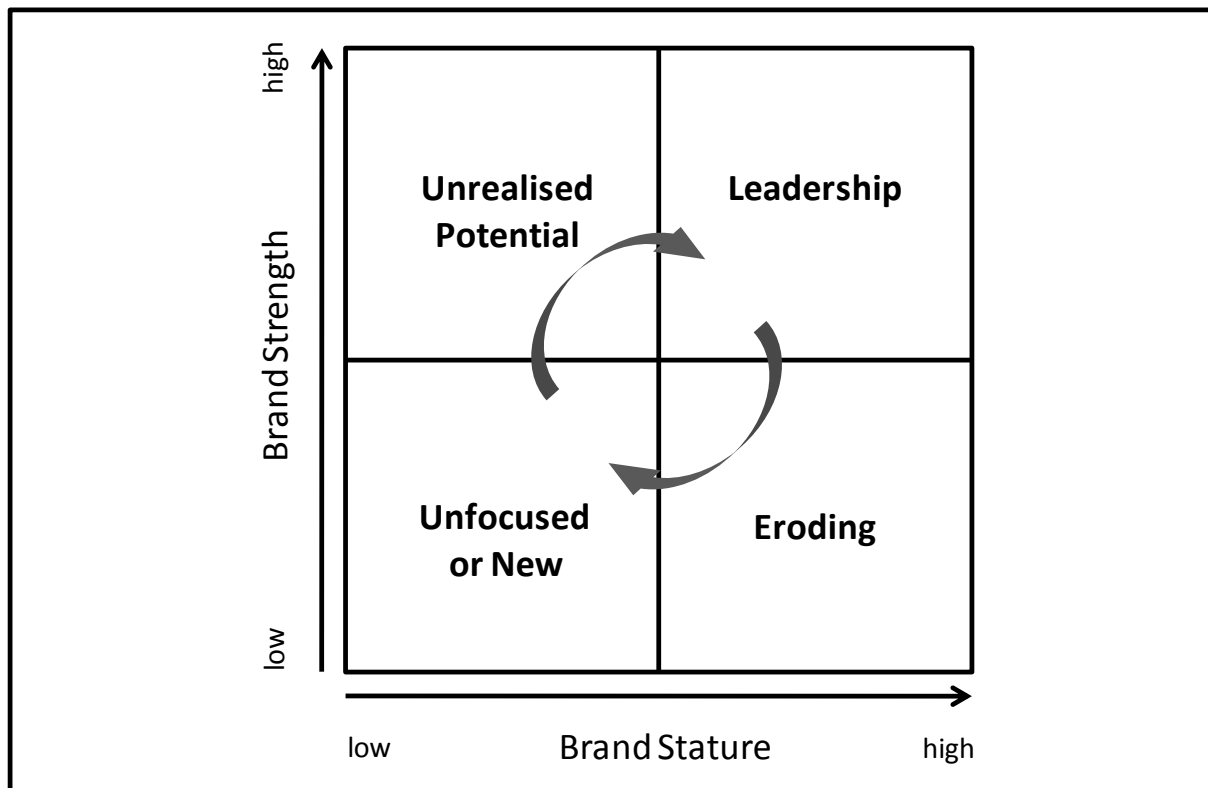
Compared to the set of brand equity model requirements, the overall procedure of the BrandAsset Valuator can be considered to fulfill major practical criteria: It is accessible and illustrative, and the brand assessment itself seems straightforward. In particular, the brand positioning matrix demonstrates the results of the brand equity model in a comprehensible manner and implies clear recommendations for practitioners. In contrast to these advantages for practitioners, the behavioral relevance of the brand equity dimensions has not been proven. Consequently, the overall appropriateness of the model seems questionable. Moreover, the assessment requires an extensive data collection procedure. In addition, the approach is subject to several drawbacks concerning academic requirements: From a transparency perspective, the available documentation of the model is limited. There is no information on how questionnaires or interviews are structured or on how the brand equity dimensions are weighted and operationalized or might interrelate. Similarly, there are no studies examining the validity and consistency of the brand equity drivers employed in this approach. Moreover, the developers of the model made no statement on possible limitations of its applicability. Finally, there are no specifications regarding the potential success of the strategic options. Altogether, it must be stated that the model suf-

³³⁸ See ESCH (2008), p. 632.

³³⁹ See YOUNG & RUBICAM (2010), pp. 1-6 and ZEDNIK/STREBINGER (2005), pp. 169-173 for an outline of the model.

fers mainly from a lack of detailed documentation, theoretical foundation, and empirical validation.³⁴⁰

Figure 12: Young & Rubicam: BrandAsset Valuator – Brand Positioning Matrix



Source: YOUNG & RUBICAM (2010), p. 5.

For the purpose of this work, the model provides some propositions regarding the conceptualization of brand equity. For one thing, the BrandAsset Valuator points to the importance of a brand's potential to differentiate from its competitors. For another, customers' attachment and bond with a brand are emphasized as long-term facets of brand equity.

A.C. Nielsen / Konzept & Markt: Brand Performance System: The Brand Performance System ultimately aims at a monetary valuation of a brand based on a set of interconnected modules covering a brand's financial performance (Brand Monitor), brand-specific success factors (Brand Steering System), and its strength (Brand Value System). In this context, the model incorporates a customer-based brand equity perspective in the Brand Value System and the Brand Steering System. The Brand Value System includes an assessment of customers' brand awareness that contributes with a weight of 40% to an overall brand value index score.³⁴¹ The Brand Steering System relies on a qualitative assessment of a brand on the basis of workshops focusing on identifying and evaluating customers' overall preference for a brand and brand-specific success factors (e.g., sym-

³⁴⁰ See ESCH (2008), pp. 632-633.

³⁴¹ The other dimensions include market-related attributes such as brand dominance (35% index weight), market penetration (10%), and market attractiveness (15%).

pathy, reputation, exclusivity). On this basis, the individual relevance of the success factors is determined in a multiple regression analysis.³⁴²

Regarding practical requirements, ZEDNIK/STREBINGER (2005) state that the model is characterized by low data collection efforts, which contributes to the accessibility and acceptance of the model in practice.³⁴³ Similarly, the model ensures the behavioral relevance of its components.³⁴⁴ However, the theoretical foundation and documentation of the approach is fragmentary, and there are no clear statements regarding its potential limitations. Moreover, in the context of the Brand Value System, it seems generally questionable whether a brand's awareness comprehensively reflects all facets of a brand's value.

For this work, the Brand Performance System suggests customers' brand awareness as a potentially relevant element of brand equity and additionally highlights the importance of including industry- and product-specific aspects in a brand equity assessment.

Info Research International: Brand Equity Engine: While ultimately focusing on determining a monetary brand value, the Brand Equity Engine includes a dominant customer-based brand equity component. The model suggests three dimensions for the construct: (1) Affinity builds upon three subcategories that reflect emotional aspects: (a) authority, referring to competence based on trust, innovation, and heritage; (b) identification, related to customers' emotional bond with a brand, their feeling that a brand cares for them, and their perception of personal experiences with the brand; and (c) approval, associated with prestige, social acceptability of the brand, and endorsement. (2) Performance refers to the functional attributes of the brand. (3) Brand Familiarity refers to the detail and extent of customers' brand-related knowledge. A brand's overall brand equity score is calculated as the sum of the Affinity and Performance scores multiplied by the Brand Familiarity score.³⁴⁵

Regarding academic requirements, one must state that information on the operationalization of the brand equity components, the model development procedure, and the data collection process is highly limited. Moreover, the theoretical foundation of the index score calculation is not provided, and an empirical validation of the model seems to be missing. From a practitioner's perspective, the model apparently consists of a manageable number of variables but does not provide evidence for the behavioral relevance of its components.

Given the major academic drawbacks and lack of documentation, the Brand Equity Engine is of limited use for this work. However, in accordance with other practice-based approaches, the model emphasizes customers' quality perceptions, brand familiarity, and relationship with the brand as potentially relevant elements of the brand equity construct.

BBDO Consulting: Brand Equity Evaluator

³⁴² See ZEDNIK/STREBINGER (2005), pp. 112-115 for an outline of the model.

³⁴³ See ZEDNIK/STREBINGER (2005), p. 115.

³⁴⁴ See FRANZEN/TROMMSDORFF/RIEDEL (1994), p. 1394.

³⁴⁵ See ZEDNIK/STREBINGER (2005), pp. 127-130 for an outline of the approach.

The Brand Equity Evaluator is a modular multistage model that can be adapted to different occasions of brand assessments.³⁴⁶ One module, the BBDO 5-Step Model of Brand Management, explicitly focuses on a customer-based brand equity perspective and differentiates between five consecutive status stages that a brand might achieve when respective drivers are fulfilled: (1) function status, related to a certain level of perceived quality and legal protection; (2) market status, associated with high levels of awareness and distribution; (3) psychographic status, depending on associations' strength, quality, and uniqueness and a brand's personality; (4) identity status, based on feelings of brand love, trust, identification, and loyalty; and (5) myth status, related to perceptions of individual and social values, tradition, desire, and timelessness. In order to reach a particular stage, a brand must achieve a certain total score and exceed specified minimum scores in all subordinate steps.³⁴⁷

From a practical point of view, the five-step model is intuitive and a brand's status can be easily interpreted. However, the model relies on an extensive set of variables that might lead to a lengthy and cost-intensive data collection process. Similarly, the behavioral relevance of the different components seems unclear. Regarding academic requirements, the approach lacks detailed documentation and a theoretical foundation. In particular, the developers assume that the different variables are independent of each other, which seems questionable in light of the fact that the model also suggests a sequence of status stages. Moreover, there is no information on the final operationalization and weighting of the indicators.

Altogether, the lack of detailed insights into the evaluation procedure behind the brand equity model limits its value for this work. However, one can state that the approach emphasizes the relevance of customers' brand awareness, quality perceptions, intrinsic bond, and admiration for a brand.

To recapitulate, the brand equity models outlined so far demonstrate the common strengths and weaknesses of practice-based conceptualizations of the construct: Overall, practice-based models are aimed mainly at being illustrative, comprehensible, and accessible. However, potential benefits in cost and time efficiency are often achieved at the expense of academic requirements. In some cases, the selection of the brand equity components seems arbitrary and does not necessarily rely on established results from research in the field of brand building.³⁴⁸ In particular, the fragmentary and undetailed documentation of the model development, measurement, data collection, and evaluation procedures is a substantial problem that drastically limits the application, adaption, and further improvement of these approaches by third parties. In this way, a majority of practice-based models defy independent examinations and make falsifications unfeasible.³⁴⁹ In fact, the lack of transparency might be attributable mainly to reasons of competition in the consulting industry.

³⁴⁶ See KLEIN-BÖLTING/MURAD-AGA (2004), p. 98.

³⁴⁷ See ZEDNIK/STREBINGER (2005), pp. 115-120.

³⁴⁸ See SATTler (2005), p. 11.

³⁴⁹ See MAZANEC (1975), p. 318.

More advanced approaches to customer-based brand equity, such as the Brand Iceberg and the MARKET-Q model, provide a more solid foundation and documentation regarding their conceptualizations. In particular, the models provide some insights into the assumed relationships between the brand equity elements. Moreover, studies have proven their empirical validity and confirmed the behavioral relevance of their brand equity components. However, from a practitioner's perspective, their overall comprehensibility and accessibility is reduced compared to more basic approaches owing to their use of more-sophisticated indicator sets and statistical analyses. In addition, their indicator sets are still comparably nontransparent and complicate an application and adaption in other studies.³⁵⁰

Altogether, the practice-based models reviewed above seem of limited value as a direct basis for the development of a brand equity model in an office property context. Nonetheless, several commonalities that may provide some points of reference for this work can be identified, although they should be considered with caution. As a result of the models' evident drawbacks regarding transparency, theoretical foundation, and empirical validation, they can offer only a rough initial guideline regarding potentially relevant brand equity components. On a general level, one can state that all the reviewed practice-based models apply a multidimensional view of brand equity, suggesting that the domain of the phenomenon comprises different facets that should be considered. In particular, the majority of approaches, including the MARKET-Q model and the Real Estate Brand Potential Index, encompass dimensions and indicators that reflect customers' brand awareness, brand-related associations, quality perceptions, and intrinsic bond or relationship with a brand.³⁵¹ Finally, approaches that rely partially on a theoretical foundation and offer empirical validation, such as the Brand Iceberg and the MARKET-Q model, propose that the brand equity components are not independent of each other but follow a chain of effects.

2.4.2.3 Research-Based Brand Equity Models

The development of research-based approaches to conceptualizing and measuring brand equity has been driven by the interchange of insights and findings from both conceptual and empirical studies. While conceptual work has focused mainly on fundamental considerations on the nature and dimensionality of brand equity, empirical studies have centered on finding evidence for the relevance of brand equity components in different settings and developing reliable and valid measures.

CHRISTODOULIDES/DE CHERNATONY (2010) and KELLER (1993) suggested differentiating between direct and indirect approaches to capturing brand equity. Direct approaches strive to measure the phenomenon directly by focusing on preferences or utilities as representations of the impact of brand knowledge on customers' brand-related responses. In this way, respective studies aim to separate the value of the brand from the value of the

³⁵⁰ For instance, BINCKEBANCK (2006), p. 75 remarks that while the operationalizations of the Brand Iceberg have already been documented to some extent, he relied on a workshop with direct support from Icon Added Value in order to adapt the indicator set to his study setting.

³⁵¹ These components are represented, for instance, in the following models: Brand Equity Evaluator, Brand Equity Engine, BrandAsset Valuator, Brand Potential Index, Brand Iceberg, Equity* Builder, MARKET-Q, and Real Estate Brand Potential Index.

products or services themselves.³⁵² Table briefly summarizes several studies that use a direct measurement of brand equity in business-to-customer setting. No studies applying a direct approach to capturing the construct in a business-to-business context were identified.

Table 3: Direct Approaches to Capturing Brand Equity

Authors	Brand Equity Measurement Approach	Field of Study	Context
Srinivasan (1979)	Brand-Specific Effect on Consumer Preference	Health Care	B2C
Blackston (1990)	Brand/Price Trade-Off	Beverages	B2C
Kamakura/Russel (1993)	Perceived Quality Brand Intangible Value	Detergents	B2C
Rangaswami/Burke/Oliva (1993)	Difference in Purchase Intention Residual Value	Yoghurt, Mouthwash, Shampoo, Cereals	B2C
Swait et al. (1993)	Equalization Prize	Deodorants, Trainers, Jeans	B2C
Park/Srinivasan (1994)	Attribute-Based Brand Equity Non-Attribute-Based Brand Equity	Toothpaste, Mouthwash	B2C
Leuthesser/Kohli/Harich (1995)	Brand Halo Effect	Detergents	B2C
Lee/Lee/Kamakura (1996)	Difference in Attribute Perception	Soft Drinks, Laundry Detergents	B2C
Myers (2003)	Perceived Utility	Soft Drinks	B2C
Shankar/Azar/Fuller (2008)	Offering Value Relative Brand Importance	Insurance	B2C

Source: Own illustration extending CHRISTODOULIDES/DE CHERNATONY (2010), p. 49.

The majority of contributions apply price- and value-based operationalizations of the construct, based on the assumption that a brand's strength is reflected mainly in its ability to command a price premium or add value to a certain product or service. Concerning their methodology, direct approaches often apply conjoint analyses in order to estimate the relevance and value contribution of the brand compared to other product features. Similarly, other studies try to capture brand equity in terms of a general bias of product attribute evaluations caused by a brand in so-called blind tests. In these experiment-based contributions, respondents are asked to evaluate products either with or without brand attribution.³⁵³

In fact, direct methods have been discussed as being conceptually and methodologically problematic as they do not account for the theoretical dimensions of the construct that may shed light on the underlying sources of brand equity. Consequently, their usefulness for deriving practical recommendations on how to build brand equity is limited. In the same way, it is questionable whether those measures cover all relevant aspects of the brand equity construct.³⁵⁴ Hence, the number of direct approaches in literature is relatively limited in comparison to indirect measurements. In recent years, direct measurement approaches seem to have further lost importance in brand research, except for being included as an additional measurement of brand equity outcomes in order to control the behavioral relevance of an indirect conceptualization of the construct. KELLER (1993) suggests that their field of application is mainly the examination of brand equity in specific situations

³⁵² See CHRISTODOULIDES/DE CHERNATONY (2010), p. 48; KELLER (1993), p. 13.

³⁵³ See ESCH (2008), pp. 648-649; KELLER (2001a), pp. 1076-1079.

³⁵⁴ See KRISHNAN/HARTLINE (2001), p. 328.

where customers make product choices, judge on brand extensions, or evaluate a change in a product's attributes.³⁵⁵

Altogether, direct approaches to measuring brand equity seem inappropriate for the purpose of this work. In particular, they do not allow for examining how brand equity is built in individuals' minds and thus do not provide the possibility to derive recommendations on how to improve a property brand's strength. Moreover, the apparent lack of studies applying direct measurements of brand equity in a business-to-business context indicates that these approaches apparently have not found acceptance in this field of research. In contrast to direct approaches, indirect approaches aim to capture brand equity through its manifestations. For this purpose, they mainly focus on potential sources (e.g., associations, attitudes, perceptions) of the construct through a set of different measures.³⁵⁶ More specifically, they strive to measure all relevant facets of individuals' brand knowledge.³⁵⁷ Table and Table provide a brief overview of studies that have aimed to conceptualize brand equity in a business-to-business context.

As an initial finding of the review, one can state that the vast majority of contributions on brand equity in an industrial setting highlight the multidimensional nature of the construct and consider a set of different dimensions. However, despite a growing variety of conceptualizations, there seems to be no consensus regarding the choice of specific brand equity components and the appropriate way to measure them.³⁵⁸ The approaches use between two and seven dimensions and propose a variety of measurements depending on their specific study setting. Nevertheless, a closer examination of the contributions shows that all contributions share a common core as they can be traced back to at least one or more brand equity components suggested by AAKER (1996, 1991) or KELLER (1993). Even if additional dimensions are added, both authors' models are explicitly or implicitly reflected in the set of dimensions or indicators applied in these studies.³⁵⁹

AAKER (1991) identified five distinct dimensions of brand equity: (1) Brand Awareness, comprising brand recognition and recall; (2) Brand Associations, referring to consumers' set of brand-specific knowledge stored in memory; (3) Perceived Quality, depicting the subjective evaluation of product or service features; (4) Brand Loyalty, describing individuals' long-term preference and attitude toward a brand; and (5) Other Proprietary Assets, such as patents and trademarks.^{360,361} Based mainly on the associative network memory

³⁵⁵ See KELLER (1993), p. 13.

³⁵⁶ See AGARWAL/RAO (1996), p. 238.

³⁵⁷ See KELLER (1993), p. 12.

³⁵⁸ See BIEDENBACH (2012), p. 21; LEEK/CHRISTODOULIDES (2012), p. 107. In fact, a similar disagreement on the construct's dimensionality and measurement has also been found repeatedly in a business-to-customer context. See CHRISTODOULIDES/DE CHERNATONY (2010), p. 44-45; ANSELMISSON/JOHANSSON/PERSSON (2007), p. 402; WASHBURN/PLANK (2002), p. 46; YOO/DONTHU (2001), p. 1.

³⁵⁹ See, for instance, the studies by CHEN/SU (2012) and CHEN/SU/LIN (2011), which include country-of-manufacture and country-of-design as individual brand equity components. However, their indicator set reveals that they are mainly a summary of country-specific brand associations. Similarly, VAN RIEL/DE MORTANGES/STREUKENS (2005) differentiate between perceived product quality and perceived service quality, which both correspond to Aaker's perceived quality dimension. Equivalently, these aspects are captured in the benefits and attributes considered in Keller's brand image.

³⁶⁰ See AAKER (1991), pp. 19-21.

model, KELLER (1993) presented another framework for conceptualizing brand equity with a clear focus on knowledge structures.³⁶² According to the author, brand equity consists of brand awareness and brand image. Similar to Aaker's suggestion, brand awareness refers to brand recall and brand recognition, while brand image covers all relevant associations of the brand in the consumer's mind.³⁶³

Although Aaker combines elements from a managerial and a consumer behavioral view, and Keller relies exclusively on a consumer-based perspective, both approaches principally highlight the same aspects.³⁶⁴ The authors unanimously emphasize the relevance of brand awareness as a prerequisite for strong brands and a cornerstone of establishing brand-related knowledge in individuals' minds. Equivalently, both approaches encompass quality aspects. However, Aaker explicitly considers customers' quality perception as a distinct component of brand equity, whereas Keller's model suggests a more abstract view and encompasses this facet in the brand image dimension in terms of a brand's benefits and attributes. A brand's image or brand-related associations are also included in both conceptualizations, although Keller applies a broader understanding that comprises all perceptions about a brand, stored as associations in individuals' memory.³⁶⁵ The brand equity frameworks disagree in one aspect of brand equity: brand loyalty. Aaker considers loyalty a distinct component, and thus a source of brand equity, whereas Keller suggests that brand loyalty is a consequence of high levels of brand equity. Altogether, Keller's main contribution lies in the explicit reference to brand knowledge as the core of all brand effects and in hypothesizing the interdependence between brand awareness and brand associations. In this regard, the author characterizes brand awareness as the necessary and brand associations as the sufficient condition for brand equity. However, considering particularly the reviewed studies in a business-to-business context, Aaker's approach to conceptualizing brand equity seems to dominate this field of research, which might be partially attributable to its applicability to managerial tasks and its more practicable operationalizability.³⁶⁶ Moreover, the model integrates the learning effects that occur in customers' minds and affect their behaviors and attitudes.³⁶⁷

³⁶¹ The approach has been criticized for not considering potential interdependencies between the construct dimensions and for not providing clear advice on how to operationalize the different brand equity components. (See ESCH (2008), p. 63.) However, in a later publication, AAKER (1996) suggests the Brand Equity Ten as a general framework for developing brand equity measures.

³⁶² See Section **Fehler! Verweisquelle konnte nicht gefunden werden.** for a brief outline of the associative network model.

³⁶³ See KELLER (1993), pp. 3-5.

³⁶⁴ See CHRISTODOULIDES/DE CHERNATONY (2010), p. 47; ANSELMSSON/JOHANSSON/PERSSON (2007), p. 402.

³⁶⁵ See KELLER (1993), p. 3.

³⁶⁶ See ANSELMSSON/JOHANSSON/PERSSON (2007), p. 402. In fact, Aaker's model also seems to be the conceptual basis for the vast majority of studies in business-to-customer settings (e.g., BUIL/DE CHERNATONY/MARTINEZ (2013); PAPPU/QUESTER/COOKSEY (2005); WASHBURN/PLANK (2002); YOO/DONTHU (2001); COBB-WALGREN/RUBLE/DONTHU (1995)).

³⁶⁷ See BIEDENBACH (2012), p. 22.

Table 4: Indirect Approaches to Capturing Brand Equity in a B2B Context (Part 1)

Authors	Brand Equity Dimensions	Field of Study
Aaker (1991)	Brand Awareness Brand Associations Perceived Quality Brand Loyalty Other Proprietary Assets	Conceptual Study
Keller (1993)	Brand Awareness Brand Image	Conceptual Study
Gordon/Calantone/di Benedetto (1993)	Brand Awareness Brand Associations Perceived Quality Brand Loyalty Other Proprietary Assets	Electrical Products and Components
Michell/King/Reast (2001)	Brand Awareness Brand Associations Perceived Quality Brand Loyalty Tangible and other Proprietary Assets	Manufacturers of Industrial Products
Baldauf/Cravens/Binder (2003)	Brand Awareness Perceived Quality Brand Loyalty	Tile Resellers
Van Riel/de Mortange/Streukens (2005)	Perceived Service Quality Perceived Product Quality Loyalty Intentions	Chemicals
Roberts/Merrilees (2007)	Service Contract Renewal Trust in Center Management	Shopping Centers
Jensen/Klastrup (2008)	Product Quality Service Quality Price Differentiation Promise Trust & Credibility	Pumps
Kuhn/Alpert/Pope (2008)	Brand Awareness Brand Image	Waste Management Systems
Davis/Golicic/Marquardt (2009)	Brand Awareness Brand Image	Logistics Services
Biedenbach/Marell (2010)	Brand Awareness Brand Associations Perceived Quality Brand Loyalty	Professional Services
Persson (2010)	Brand Familiarity Product Solution Service Distribution Relationship Company	Packaging
Chen/Su/Lin (2011)	Brand Awareness Perceived Product Quality Perceived Service Quality Brand Loyalty Country-of-Origin	Fasteners

Source: Own illustration extending KIM/HYUN (2011), p. 426.

Table 5: Indirect Approaches to Capturing Brand Equity in a B2B Context (Part 2)

Authors	Brand Equity Dimensions	Field of Study
Biedenbach/Marell (2010)	Brand Awareness Brand Associations Perceived Quality Brand Loyalty	Professional Services
Persson (2010)	Brand Familiarity Product Solution Service Distribution Relationship Company	Packaging
Chen/Su/Lin (2011)	Brand Awareness Perceived Product Quality Perceived Service Quality Brand Loyalty Country-of-Origin	Fasteners
Juntunen/Juntunen/Juga (2011)	Brand Awareness Brand Image	Logistics
Biedenbach/Bengtsson/Wincent (2011)	Brand Associations Perceived Quality Brand Loyalty	Professional Services
Kim/Hyun (2011)	Brand Awareness with Associations Perceived Quality Brand Loyalty	Software
Biedenbach (2012)	Brand Awareness Brand Associations Perceived Quality Brand Loyalty	Professional Services
Bondesson (2012)	Service Relationship Product Solution Company Reputation Brand Community Brand Familiarity Brand Loyalty Price Premium	Packaging
Chen/Su (2012)	Brand Awareness Perceived Product Quality Perceived Service Quality Brand Loyalty Country-of-Manufacture Country-of-Design	Fasteners
Kalafatis et al. (2012)	Brand Awareness Trust Economic Benefits Functional Benefits	Software

Source: Own illustration extending KIM/HYUN (2011), p. 426.

A closer review of the contributions that apply Aaker's framework shows that only two studies (MICHELL/KING/REAST (2001); GORDON/CALANTONE/DI BENEDETTO (1993)) refer to the full set of five dimensions. Other authors have repeatedly made adjustments in order to reflect the characteristics of their studies. Apart from individual adaptations due to specifics of the study objectives and the product category, two recurring occasions for changes in Aaker's original model can be identified. For one thing, the fifth dimension (other proprietary assets) has been frequently neglected in favor of a clear customer-based perspec-

tive of the brand equity construct.³⁶⁸ For another, authors have suggested different adjustments regarding the relevance of specific dimensions to reflect the particularities of the business-to-business context, such as a limited number of market participants, the importance of long-term relationships, the need to justify decisions within a buying center, and the partial assumption of more rational decision criteria.³⁶⁹

Brand awareness is included in most of the approaches to conceptualizing brand equity. In particular, DAVIS/GOLICIC/MARQUARDT (2009) argue that across many business-to-business industries, a brand with high levels of awareness has an increased chance of being considered in a purchase decision and thus is more likely to be selected compared to unknown brands.³⁷⁰ This view is also supported by VAN RIEL/DE MORTANGES/STREUKENS (2005).³⁷¹ However, the publications show no consensus in this respect. For instance, HOMBURG/KLARMANN/SCHMITT (2010) found that brand awareness may vary depending on market, situation, and buying center characteristics.³⁷² Similarly, BIEDENBACH (2012) states that brand awareness might be of lesser importance for well-established companies, since business-to-business markets exhibit a comparably small number of buyers that might easily be aware of all relevant brands.³⁷³ In a study on brand equity in a professional services context, BIEDENBACH/MARELL (2010) also did not find support for brand awareness as a relevant component of brand equity.³⁷⁴ In this regard, BONDESSON (2012) and PERSSON (2010) both point to the fact that mere brand awareness in terms of recognition or recall might not be enough to influence individuals' decision making in a business-to-business context and suggest including brand familiarity as a reflection of customers' level of acquaintance with a brand.³⁷⁵

Several of the studies reviewed explicitly considered brand associations as a brand equity component and emphasized its importance in an industrial context.³⁷⁶ Most publications that did not explicitly account for brand associations still included measurements that are reflections of Aaker's original dimension.³⁷⁷ For instance, VAN RIEL/DE MORTANGES/STREUKENS (2005) explicitly excluded brand associations and argued that brands seldom evoke non-product related associations in business-to-business settings. However, a closer look at the indicator set of the suggested dimensions demonstrates that non-product related associations such as reputation and corporate associations are implicitly captured by the proposed product brand equity and corporate brand equity constructs.³⁷⁸ The study by Baldauf/Cravens/Binder (2003) did not include brand associations and in-

³⁶⁸ See JUNTUNEN/JUNTUNEN/JUGA (2011), p. 303.

³⁶⁹ For a brief summary of relevant characteristics of business-to-business environments, see the discussion of office properties as industrial goods in Section **Fehler! Verweisquelle konnte nicht gefunden werden..** For a more detailed overview, see, for instance, KELLER (2009), p. 14.

³⁷⁰ See DAVIS/GOLICIC/MARQUARDT (2009), p. 204.

³⁷¹ See VAN RIEL/DE MORTANGES/STREUKENS (2005), p. 842.

³⁷² See HOMBURG/KLARMANN/SCHMITT (2010), pp. 207-208.

³⁷³ See BIEDENBACH (2012), p. 24.

³⁷⁴ See BIEDENBACH/MARELL (2010), p. 453.

³⁷⁵ See BONDESSON (2012), pp. 33-34; PERSSON (2010), p. 1270.

³⁷⁶ See BIEDENBACH (2012), pp. 24-25; BIEDENBACH/MARELL (2010), pp. 448-449; MICHELL/KING/REAST (2001), pp. 416-418; GORDON/CALANTONE/DI BENEDETTO (1993), pp. 8-10.

³⁷⁷ See CHEN/SU (2012), p. 63; CHEN/SU/LIN (2011), p. 1237; JENSEN/KLAstrup (2008), p. 125.

³⁷⁸ See VAN RIEL/DE MORTANGES/STREUKENS (2005), p. 842.

stead strongly focused on different aspects of perceived quality. However, the authors did not comment on the reasons for their decision to exclude the construct.³⁷⁹

Aaker's perceived quality dimension is explicitly or implicitly considered in all reviewed approaches to conceptualizing brand equity in a business-to-business context, indicating the high level of acceptance of the component. In particular, GORDON/CALANTONE/DI BENEDETTO (1993) point to the fact that a professional buyer's negative quality perception might even lead to a switch of the supplier in all product and service categories that are relevant for that customer.³⁸⁰

Equivalently, all contributions have encompassed brand loyalty, either directly as a separate dimension or indirectly through loyalty-related indicators, such as customers' willingness to recommend a brand or their attachment toward it. According to GORDON/CALANTONE/DI BENEDETTO (1993), the crucial importance of brand loyalty in a business-to-business context results from the limited number of market participants. Thus, gaining or losing even a few customers can have a tremendous negative effect on a company's profitability.³⁸¹

Besides the frequent adaption of Aaker's brand equity dimensions, an emphasis on relationship-related aspects can be noted in several contributions as a way of accounting for the importance of long-term relationships in industrial settings. For example, BONDESSON (2012) and PERSSON (2010) include specific relationship facets such as trustworthiness and cooperation.³⁸² Similarly, JENSEN/KLASTRUP (2008) underline the importance of the supplier-customer relationship and identify trust and credibility as major influencing factors that dominate even price perceptions and service quality perceptions.³⁸³ With a particular relevance for this study, ROBERTS/MERRILEES (2007) also draw attention to the role of trust as a constitutive characteristic of a valued relationship between shopping center tenants and the center management and as a major determinant of occupiers' willingness to renew their contract.³⁸⁴

Regarding the set of practical and academic criteria, one can state that research-based approaches in general, and Aaker's brand equity model in particular, exhibit several advantages that are of major importance for this work. In contrast to the reviewed practice-based approaches, Aaker's framework stands out due to its theoretical foundation in consumer behavior and its empirical validation in an ever growing number of studies across different study settings. Moreover, the original model and its adaptations are well-documented and transparent regarding their conceptualizations and measurements. In addition, most authors comment on the limitations of their suggested models and point to appropriate fields of application. Considering practical requirements, Aaker's original model is characterized by a manageable number of brand equity dimensions that generally allow for deriving comparably concrete recommendations on how to improve a brand's strength. However, respective contributions from the research literature are often based

³⁷⁹ See BALDAUF/CRAVENS/BINDER (2003), pp. 227-228.

³⁸⁰ See GORDON/CALANTONE/DI BENEDETTO (1993), p. 5.

³⁸¹ See GORDON/CALANTONE/DI BENEDETTO (1993), pp. 5-6, 14-15.

³⁸² See BONDESSON (2012), pp. 33-34; PERSSON (2010), p. 1270.

³⁸³ See JENSEN/KLASTRUP (2008), pp. 126-127.

³⁸⁴ See ROBERTS/MERRILEES (2007), p. 412.

on complex, extensive, and industry-specific sets of indicators for measuring the brand equity construct. Moreover, they usually rely on complex statistical methods that might limit their comprehensibility and accessibility from a practitioner's perspective.

However, altogether, Aaker's model seems to be a promising framework for the development of a brand equity model in an office property context. In particular, its advantages regarding academic requirements and its obvious dominance in the field of industrial brand equity research suggest the model as an appropriate basis for the second study in this work.

The review of adaptations of Aaker's original model offered several valuable points of reference for this work. For one thing, the applicability of the fifth dimension (other proprietary assets) is generally questionable when a clear customer-based brand equity perspective is applied. Thus, it seems appropriate to exclude this component from the conceptual domain of brand equity for the purpose of this work. For another, the business-to-business context might require some adaptations of Aaker's framework. In particular, the individual relevance of the different dimensions may vary between study settings and should be clarified for the office property context. In this regard, special attention should be paid to the role of brand awareness, and the potential relevance of brand familiarity should be discussed. Moreover, the particular importance of trust as a cornerstone of valued business relationships should be examined in the light of the characteristics of the office property setting and might be considered in the conceptualization of the brand equity construct.

The relevance of the different brand equity components and potential adjustments in a business-to-business environment were only briefly discussed on a general level in this section in order to derive the fundamental reference points for the second study in this work. Their actual applicability in an office property context is examined in more detail in Section **Fehler! Verweisquelle konnte nicht gefunden werden..**

2.4.3 Hierarchy of Effects as a Framework for Building Customer-Based Brand Equity

Following a customer-based brand equity perspective, the dimensions of the construct can be seen as core components of individuals' brand knowledge that should be addressed by marketers in order to build strong brands in customers' minds, which ultimately have an influence on their preferences and purchasing behavior. In this regard, AAKER's (1996, 1991) original model did not explicitly account for the potential relationships between the dimensions of brand equity but rather focused on describing their conceptual domain and suggesting different perspectives for the development of measurement approaches. However, later advances of the model obviously suggest a causal order between the brand equity elements.

In order to develop a sequence of the brand equity components, authors have frequently relied on hierarchy-of-effects models as a framework for their hypotheses. Hierarchy-of-effects approaches, which originate from the field of advertising effectiveness research in a business-to-customer context, assume a connected series of responses to communica-

tion, where customers' attitudes develop in a sequence of consecutive steps.³⁸⁵ In this regard, hierarchy-of-effects models differ primarily in their level of detail and thus in the number of stages.³⁸⁶ Their common core, however, is the assumption that according to cognitive learning theory, cognitive advertising effects precede affective effects, which are followed by conative effects. Together, cognitive, affective, and conative elements form an individual's overall attitude.³⁸⁷

The AIDA model, developed by LEWIS in 1898 as a practice-based recommendation for the structure of sales conversations, is one of the most well-known hierarchy-of-effects models.³⁸⁸ The model suggests that advertising must catch customers' attention, raise their interest, convince them that they desire the product or service, and lead them toward purchasing. Descending from Lewis' basic approach, numerous hierarchy-of-effects models have been developed, of which the model proposed by LAVIDGE/STEINER (1961) has been repeatedly applied in a brand equity context.³⁸⁹ The model consists of six stages that represent the sequence of an informed customer's responses to communication efforts from viewing a product advertisement to product purchase: (1) *awareness*, referring to a customer's initial acquaintance with a product or service; (2) *knowledge*, denoting product-related knowledge resulting from direct and indirect experiences; (3) *liking*, related to a favorable evaluation of a product; (4) *preference*, representing a preferential judgment compared to rival products in this category; (5) *conviction*, referring to a customer's wish to purchase the product and the reassurance that acquiring the product is a safe choice; and (6) *purchase*, describing the actual act of buying the product.³⁹⁰ Considering the sequence of the stages, the authors remark that the steps are not necessarily equidistant and that customers may move up several steps simultaneously.³⁹¹ The authors were the first to associate these steps with the cognitive, affective, and conative components proposed by attitude theory.³⁹² In this regard, Lavidge/Steiner suggested that the first two stages relate to the cognitive or rational dimension, the third and fourth to the affective or emotional dimension, and the fifth and sixth to the conative or motivational dimension.³⁹³

However, hierarchy-of-effects models, such as the AIDA model or Lavidge/Steiner's model, have not been free of criticism. In particular, they have been criticized for overly simplistic assumptions. For instance, they do not consider contextual and potentially disrup-

³⁸⁵ See ORMENO (2007), pp. 63-64.

³⁸⁶ See HUBER/MEYER/NACHTIGALL (2009), pp. 12.

³⁸⁷ See KOTLER/BLIEMEL (2001), p. 894. In fact, mainly the change from a stimulus-response paradigm toward a stimulus-organism-response paradigm, which emphasizes the importance of individuals' attitudes as major factors influencing the effectiveness of communication activities, has driven the development of hierarchy-of-effects models. However, they are still incapable of explaining exactly how attitudes are developed in individuals' minds and provide only speculative answers based on observable stimuli and responses. (See BONGARD (2002), pp. 213-214.)

³⁸⁸ See HUBER/MEYER/NACHTIGALL (2009), pp. 12; KROEBER-RIEL/WEINBERG (2003), p. 612; KOTLER/BLIEMEL (2001), pp. 891-894.

³⁸⁹ For a comprehensive overview and critical discussion of hierarchy-of-effects models, see, for instance, BONGARD (2002), pp. 211-292.

³⁹⁰ See HUBER/MEYER/NACHTIGALL (2009), pp. 13; BONGARD (2002), pp. 219-220; LAVIDGE/STEINER (1961), p. 59. It should be noted that the authors originally suggested seven steps, including customers' *unawareness* as an initial stage.

³⁹¹ See LAVIDGE/STEINER (1961), p. 60.

³⁹² See BONGARD (2002), p. 220.

³⁹³ See LAVIDGE/STEINER (1961), p. 60.

tive factors, such as individuals' involvement, interferences with positive attitudes toward other products of the same category, financial restrictions, or individual values and expectations of an individual's peer group.³⁹⁴ In a brand context, WEILBACHER (2001) emphasizes that "For most brands, the consumer mind is not a blank sheet awaiting information and instruction from advertising."³⁹⁵ Consequently, the author states that not only marketers' brand building efforts form the context of brand selections and purchase decisions but rather the collective residue of all prior experiences of an individual. In a response to Weilbacher's criticism, BARRY (2002) generally acknowledges the main drawbacks of hierarchy-of-effects models but strongly emphasizes their overall value as an intuitive and accessible training, planning, and conceptual tool that helps to predict behavior and provides information on where advertising and brand building strategies should focus.³⁹⁶

In fact, their accessibility might be one of the main reasons hierarchy-of-effects models have been repeatedly applied as a framework for studying the causal order among the dimensions of brand equity from a customer's view. In a business-to-customer context, for instance, YOO/DONTHU (2001) directly referred to Lavidge/Steiner's model in order to explain a potential causal relationship between the different components of the construct.³⁹⁷ Similarly, CHIOU/DROGE/HANVANICH (2002) relied on a cognitive-affective-conative framework to investigate the sequence of steps to building brand loyalty.³⁹⁸ Building upon the work of Chiou/Droge/Hanvanich and Lavidge/Steiner's model, GIL/ANDRÉS/SALINAS (2007) derived hypotheses on how brand equity components might interrelate in a convenience goods setting.³⁹⁹ Likewise, in their studies on antecedents and consequences of brand equity in sportswear, consumer electronics, and automotive markets, BUIL/DECHERNATONY/MARTÍNEZ (2013) and BUIL/MARTÍNEZ/DE CHERNATONY (2013) referred to the traditional hierarchy-of-effects model in order to develop a framework regarding the relationships among brand equity dimensions.⁴⁰⁰ Finally, it should be noted that the basic sequence of cognitive, affective, and conative stages has also been incorporated into brand building theories such as the customer-based brand equity pyramid proposed by KELLER (2001b).⁴⁰¹ In particular, Lavidge/Steiner's model is reflected in the brand equity building steps (identity, meaning, response, relationship) and the corresponding six building blocks (salience, performance, imagery, judgment, feelings, resonance).⁴⁰²

³⁹⁴ See REINECKE/JANZ (2007), pp. 227-229; KROEBER-RIEL/ESCH (2004), pp. 158-159; ZEITHAML/BERRY/PARASURAMAN (1996), p. 33.

³⁹⁵ See WEILBACHER (2001), p. 22.

³⁹⁶ See BARRY (2002), p. 46.

³⁹⁷ See YOO/DONTHU (2001), p. 12.

³⁹⁸ See CHIOU/DROGE/HANVANICH (2002), p. 114.

³⁹⁹ See GIL/ANDRÉS/SALINAS (2007), pp. 190-191.

⁴⁰⁰ See BUIL/DECHERNATONY/MARTÍNEZ (2013), p. 118; BUIL/MARTÍNEZ/DE CHERNATONY (2013), p. 63.

⁴⁰¹ See KELLER (2001b), p. 17.

⁴⁰² For a business-to-business context, KUHN/ALPERT/POPE (2008) proposed a modified version of Keller's brand equity pyramid in order to account for particularities of the industrial setting. The authors suggested replacing *imagery* with *supplier reputation*, since business customers' associations focused mainly on product performance features. Moreover, they concluded that emotions are less important in a business-to-business context and proposed replacing the *feelings* building block with *sales force relationship*. Finally, *salience* should focus on the manufacturer brand, and *resonance* should refer to customers' relationship with representatives of the company behind the brand. However, other publications, such as LEEK/CHRISTODOULIDES (2012) and

Compared to brand equity research in a business-to-customer setting, few contributions have considered direct effects between brand equity dimensions in a business-to-business environment. In an early study, GORDON/CALANTONE/DI BENEDETTO (1993) suggested five evolutionary stages of brand equity, relying mainly on Aaker's brand equity dimensions: (1) brand birth, (2) creation of brand awareness and associations, (3) establishing quality and value perceptions, (4) emergence of brand loyalty, and (5) launching of brand extensions. Nonetheless, one must state that despite their valuable explanation of a hierarchy of effects among brand equity elements, the authors provide only exploratory evidence to support this model.⁴⁰³ KIM/HYUN (2011) consider several direct effects between the brand equity dimensions in a model examining the impact of marketing-mix efforts and corporate image on brand equity in the IT software sector.⁴⁰⁴ It should be noted, however, that the model deviates from Aaker's original suggestion as it does not distinguish between awareness and associations but rather proposes a combined construct. In closer proximity to Aaker, BIEDENBACH (2012) and BIEDENBACH/MARRELL (2010) refer to GORDON/CALANTONE/DI BENEDETTO'S (1993) model and suggest a causal chain between the four brand equity dimensions. The authors point out that brand awareness is a necessary condition for establishing a brand node in memory. On this basis, brand-related experiences result in brand associations, which may lead to positive perceptions of a company's performance and quality level. In the last step, those favorable judgments may translate into brand loyalty.⁴⁰⁵ In a professional services context, the authors found strong empirical support for their hypotheses, although BIEDENBACH/MARELL (2010) were not able to confirm a positive effect of brand awareness on brand associations. As a last case in point, it should be noted that the practice-based MARKET-Q model also assumes a basic hierarchy of effects between its brand equity dimensions but without directly referencing Aaker's model. Nonetheless, considering the facets of the different constructs, the sequence of influencing factors (product and process quality, relationship quality, and brand quality) and effects (price, volume, and support premium) corresponds to the basic cognitive-affective-conative framework.⁴⁰⁶

The above considerations provide a main point of reference for this work. Existing publications in business-to-business and business-to-customer settings strongly suggest that brand equity dimensions are interrelated. More specifically, brand equity components may follow a causal order that represents an individual's learning process in building brand-related knowledge structures. In this regard, hierarchy-of-effects models seem to be a promising basic framework for determining a general sequence of brand equity dimensions and deriving more specific hypotheses. In particular, Lavidge/Steiner's model and the underlying cognitive-affective-conative framework have been repeatedly applied in earlier studies and might also prove valuable for examining how brand equity is built in an office property context. Incorporating hierarchy-of-effects models as a framework for conceptualizing brand equity is also explicitly supported by BIEDENBACH (2012a), who states

JENSEN/KLASTRUP (2008), clearly emphasize the relevance of emotions and imagery in a business-to-business context, thus partially questioning the relevance of Kuhn/Alpert/Pope's adjustments.

⁴⁰³ See GORDON/CALANTONE/DI BENEDETTO (1993), p. 5.

⁴⁰⁴ See KIM/HYUN (2011), p. 429.

⁴⁰⁵ See BIEDENBACH (2012), pp. 28-29; BIEDENBACH/MARRELL (2010), p. 449.

⁴⁰⁶ See BAUMGARTH/DOUVEN (2010), pp. 647-652.

that "(...) knowledge about the interrelationships present between the dimensions of brand equity can be of high value for companies aiming to build strong brands, because actions aimed to enhance one of the dimensions might have potential consequences for the other dimensions."⁴⁰⁷

2.5 Chapter Summary

The second chapter of this work focused on the theoretical framework and conceptual fundamentals of the two studies that were conducted. For this purpose, office properties and brands in a business-to-business context were briefly specified in a first step. Afterward, risk theory and relevant findings from the field of cognitive psychology were summarized in order to emphasize the basic fundament for understanding the effectiveness of brands and their potential functions from a customer perspective. On this basis, the process of establishing a brand in individuals' minds was characterized as a learning process that is based on indirect and direct brand-related experiences and successively leads to a consolidation of the corresponding knowledge structures. Moreover, brands were identified as a means to reduce perceptions of personal and organizational risk in decision processes, which provided initial support for the relevance of brands in an office property context.

In a next step, particularities of office properties as industrial goods, office property markets, and office leasing decisions were highlighted, and the current status quo of real estate research on property brands was presented. Altogether, office properties were described as highly complex and non-substitutable support factors that are acquired in extensive multistage organizational renting decisions associated with conflicting interests and ultimately resulting in a long-term legal, economic, and social relationship. On this basis, the potential applicability of business-to-business brand functions was discussed, leading to the conclusion that tenants may particularly benefit from a potential reduction of perceived risk and the representative character of brands as a means for identification and demonstrating values. Moreover, brands may be beneficial for tenants by improving the communication efficiency of brand-related information and support their orientation in intransparent real estate markets. However, extensive market screening processes and the involvement of real estate agents or consultants may limit this effect. On balance, the considerations support the applicability of brand functions in an office property context and, thus, their overall relevance.

Finally, the concept of customer-based brand equity as a guiding principle for brand building was discussed focusing on practice- and research-based approaches to conceptualizing the construct in a business-to-business setting. On this basis, AAKER's (1996, 1991) brand equity dimensions were identified as an appropriate point of reference for developing a model of brand equity for office property brands. A review of earlier adaptations of the author's model to an industrial setting highlighted that several adjustments might be necessary to reflect the particularities of the context. In particular, the role of brand awareness, brand familiarity, and trust were emphasized in this regard and require further consideration regarding the particularities of office properties. In a last step, hierarchy-of-

⁴⁰⁷ See BIEDENBACH (2012), p. 28.

effects models were introduced as an appropriate framework to examine the interrelations between the elements of brand equity.

3 Study I: Performance Effects of Property Brands

The previous sections highlighted that brands may have beneficial functions for tenants, therefore suggesting their overall relevance in an office property context. On this basis, this chapter covers the objectives, methodology, and findings of an empirical study exploring the effectiveness of property brands in terms of their relationship with a building's economic performance. After outlining the study objectives and describing the dataset, multi-level modeling is discussed as an appropriate methodology to meeting the particularities of the hierarchical data structure. Finally, the results of the study are presented and critically reviewed. In order to provide a comprehensive and detailed picture, the study outline follows the reporting guidelines for hierarchical modeling suggested by FERRON et al. (2004).⁴⁰⁸

3.1 Study Objectives

As discussed in Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**, property owners hope that branding activities have a positive effect on the overall performance of office properties, since investments in property brands are only justified if they result in an enhanced economic outcome. In this regard, FISCHER/VÖLCKNER/SATTLER (2010) state that the economic potential of brand investments in a specific sector should be assessed carefully, since it may vary strongly across industries.⁴⁰⁹ Indeed, the considerations in previous sections suggest that tenants may benefit from office property brands through a reduction of perceived risk, increased information efficiency, and means of representation. Similarly, real estate practitioners' anecdotal experiences and real estate-related contributions imply that brands might be positively related to properties' overall success in the market.⁴¹⁰ In particular, MUSSLER's (2010) 'Brand Value Chain' proposes that brands may influence the behavior of respective target groups, leading to an improvement of relevant performance indicators (e.g., market value, rental price premium).⁴¹¹ However, in fact, the actual economic effects of branding a property have not been empirically analyzed in prior publications. For this reason, this study focuses on exploring the relationship between properties' brand status and their economic performance in order to further substantiate the overall relevance of brands in an office property context.

Looking at the property and real estate market characteristics outlined in Sections **Fehler! Verweisquelle konnte nicht gefunden werden.** and **Fehler! Verweisquelle konnte nicht gefunden werden.**, this study also considers two particularities of properties that should be taken into account during the investigation. On the one hand, buildings' fixation to a certain location entails interdependencies between the property and the specifics of the location, which might also lead to differences in the relationship between a property's brand status and its performance.⁴¹² Moreover, the geographic segmentation of German real estate markets might contribute to variances in property brands' overall effectiveness.

⁴⁰⁸ See FERRON et al. (2004), pp. 31-32.

⁴⁰⁹ See FISCHER/VÖLCKNER/SATTLER (2010), p. 823.

⁴¹⁰ See KIRCHER (2010), pp. 43-44; ROULAC (2007), p. 433; HÄGG/SCHULTZ (2006), p. 5; VIITANEN (2004), p. 3.

⁴¹¹ See MUSSLER (2010), pp. 112-114.

⁴¹² See BONE-WINKEL/SCHULTE/FOCKE (2008), pp. 17-18.

Thus, it cannot necessarily be assumed that potential differences between branded and non-branded properties are the same across distinct locations. On the other hand, properties commonly depict a high level of heterogeneity with regard to building attributes such as age, quality, visual appearance, and rental price amongst others. These individual traits might also yield a direct impact on properties' performance or might develop an influence on the relationship between a building's brand status and its performance. Finally, property markets' cyclicity might lead to variances in the relationship between a property's brand status and its performance over time.

As outlined in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, the existing body of knowledge on the effects and functions of property brands is scarce, and there are no prior property-specific considerations or empirical findings that could be a basis for developing a sound hypothesis in this regard. Thus, this study does not have the benefit of building upon a foundation of empirically rich literature. In particular, there are no appropriate references to conclude how the economic effects of property brands might vary depending on property specifics. For this reason, this study is clearly more explorative in nature and follows a set of objectives that tap into the direction of property brands' general economic effectiveness and potential influencing factors derived from acknowledged particularities of properties and real estate markets.

Against this background, the objective of this study is threefold: (1) to examine the relationship between properties' brand status and their economic performance while controlling potential covariates, (2) to uncover potential variances in this relationship depending on the macro location, and (3) to investigate potential interactions between a property's brand status and relevant covariates.

3.2 Data Basis

This chapter covers the dataset that was used for the study and its preparation for the analysis. In an initial step, the data supplier is introduced before the variables, their scaling, and their hierarchical structure are outlined. From there, the preparation of the dataset such as centering of variables, transformations, and dealing with outliers is described. In a last step, a descriptive overview of the final dataset is provided.

3.2.1 Data Source

As outlined in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, German real estate markets are characterized by a high level of intransparency. Several initiatives have focused on improving this situation; however, there is still a lack of comprehensive databases that cover detailed information at the property level.⁴¹³ Correspondingly, the number of data sources for this study was highly limited.

With this serving as a background, the IPD Investment Property Databank was selected as data resource for the investigation. The private institution is the publisher of the IPD Germany Annual Property Index, which tracks the performance of approximately 2,200 property investments with a total capital value of 49.5 billion Euros as of December, 2013.

⁴¹³ See BONE-WINKEL/SCHULTE/FOCKE (2008), p. 22-23.

The market coverage is estimated to be around 20-30%. It is widely considered one of the most comprehensive and reliable databanks for the German property market and is commonly used for benchmarking processes and investment decisions. Investors provide their property data, which covers no less than market values, contract rent, usable area, building age, and property brand names. The database is limited to existing properties under management and does not contain running project developments or transactions.⁴¹⁴

Out of the complete IPD database, historical information on all German office properties (properties with a predominant part of office use) ranging from 2006 to 2012 was provided in a specialized report.⁴¹⁵ The dataset was subsequently supplemented by information from the German *Zensus 2011*, adding the number of inhabitants of the cities where the properties are located.⁴¹⁶

In accordance with the data security standards upheld by the IPD Investment Property Databank, the dataset can only be used after a complete anonymization. Therefore, the detailed address of the properties was hidden, leaving only the city name, postcode area, property number, and the year of measurement for identification purposes. Moreover, properties' market value was only available on a per-square-meter basis. Their total market value was not accessible so as to prevent someone from identifying the property. In addition, precise information on the usable area of the buildings was also not provided, since the properties were assigned to different size groups.

3.2.2 Variables and Scaling

When investigating the relationship between properties' branding and their economic performance, appropriate measures of both the dependent variable and the primary independent variable and its covariates, must be identified. On the other hand, the limitations of the data source must be taken into account so that not all potentially relevant factors can be included in the study.

'Brand Status' (independent variable): In the course of this study, brand status is a binary variable distinguishing between branded and non-branded office buildings (0 = non-branded, 1 = branded). Office properties are listed in the IPD database as being branded when they have a self-contained name that goes beyond the mere address of the building. However, a precise decision guideline is not available. As such, whether or not a property is branded strongly relies on the assessment of the database participants themselves. A review of the classifications and identification of property-specific branding activities was unfeasible due to the anonymization of the dataset. Nevertheless, for all properties that are listed as being branded, it can be assumed that a minimum of concerted branding activities was carried out in order to establish an individual name in the market.

⁴¹⁴ See IPD Investment Property Databank (2013), p. 1.

⁴¹⁵ Period of data access: June/July 2013. The specialized report was assembled and provided by the IPD Investment Property Databank.

⁴¹⁶ The *Zensus 2011* was carried out by the German national and regional statistical offices in close cooperation with the municipal survey offices. The survey covered app. 1/3rd of the German population, collecting information on living, housing, and working conditions. See STATISTISCHE ÄMTER DES BUNDES UND DER LÄNDER (2013).

'Value' (*dependent variable*): The performance of office buildings is ultimately reflected in their market value, which is the price for which a property would trade in a competitive setting.⁴¹⁷ This value usually consists of the land plot and land rights value and the value of buildings and structures erected on the property. This figure is at the focal point of property transaction processes and investment decisions and is a key performance indicator in real estate asset management.⁴¹⁸ The monetary value of a property is usually determined by independent certified valuers according to standardized valuation methods, taking a range of relevant value drivers into account. From a valuer's perspective, the market value is the consolidation of all particularities of a property and its location and thus, also implicitly accounts for the property's brand status. Regarding the overall degree of accuracy, it must be stated that different valuers might determine a different value for the same property. In general, deviations of +/- 10% are accepted in real estate practice.⁴¹⁹ Altogether, properties' market value seems an appropriate representation of their economic performance and is chosen to serve as the dependent variable in this study. The variable 'Value' is captured in Euro-per-square-meter on a metric scale.

Regarding the potential covariates of properties' brand status, other relevant aspects that are typically considered in the course of a property valuation should be controlled for as well, since they may be related to the property value itself and might also have an impact on the relationship between 'Brand Status' and Value. Consequently, valuation approaches that are regularly used in the appraisal of office properties in Germany are an appropriate basis for the selection of relevant variables.

For spatial reasons and the overall focus of this study, real estate valuation approaches are not discussed in greater detail at this point. Two valuation approaches are of interest in the course of this study: The German "*Ertragswertverfahren*", which is typically applied in the valuation of income-generating investment properties, and the "*Vergleichswertverfahren*", which is sometimes used as a second validation of the income-based method. As a basis for the discussion of covariates, Figure provides a brief overview of factors that are considered in the two approaches.

An in-depth discussion of German and international valuation methods is found in LEOPOLDSBERGER/THOMAS/NAUBEREIT (2008), pp. 460-522.⁴²⁰ A detailed outline and legal basis for standardized German valuation approaches is provided in the *Immobilienwertermittlungsverordnung – ImmoWertV* (2010) and the *Wertermittlungsrichtlinien – WertR* (2006), including its amendments *Sachwertrichtlinie – SW-RL* (2012) and *Ver-*

⁴¹⁷ The precise legal definition of properties' market value is found in the German Federal Building Code: "Der Verkehrswert wird durch den Preis bestimmt, der in dem Zeitpunkt, auf den sich die Ermittlung bezieht, im gewöhnlichen Geschäftsverkehr nach den rechtlichen Gegebenheiten und tatsächlichen Eigenschaften, der sonstigen Beschaffenheit und der Lage des Grundstücks oder des sonstigen Gegenstands der Wertermittlung ohne Rücksicht auf ungewöhnliche oder persönliche Verhältnisse zu erzielen wäre." See BAUGESETZBUCH – BAUGB (2004), §194.

⁴¹⁸ See ERNST & YOUNG REAL ESTATE (2012), p. 66; GREINER/THOMAS (2011), p. 68; LEOPOLDSBERGER/THOMAS/NAUBEREIT (2008), p. 455.

⁴¹⁹ See LEOPOLDSBERGER/THOMAS/NAUBEREIT (2008), p. 461.

⁴²⁰ See LEOPOLDSBERGER/THOMAS/NAUBEREIT (2008), pp. 460-522. The subsequent considerations on factors influencing properties' value are based on these sources.

gleichswertrichtlinie VW-RL (2014).⁴²¹ KLEIBER/FISCHER/WERLING (2013), which offer a comprehensive comment on current legislation and guidelines and their application in real estate practice.⁴²² The subsequent considerations on factors influencing properties' value are based on these sources.

Figure 13: Overview of Standardized German Approaches Applied in the Course of Office Property Valuations

	Income Approach (Ertragswertverfahren)	Comparison Approach (Vergleichswertverfahren)
Short Description	Appraisal based on the land plot value and the net present value of the future income streams generated by the subject property	Appraisal based on a comparison of the subject property with a sufficient number of comparable property transactions
Applicability	Typically applied for properties that were purchased for investment reasons	Typically used for single and smaller multi-family homes; sometimes used as an additional validation for the income approach in commercial property valuations
Factors Influencing the Property Value	Building value is determined by: <ul style="list-style-type: none"> - Net rental income based on <ul style="list-style-type: none"> - Contractual rent - Usable area - Operating expenses - Multiplier that reflects <ul style="list-style-type: none"> - Property yield (accounts for type of use, building quality, condition of the real estate and capital markets considering the specific location) - Remaining useful economic life - Other value-affecting circumstances such as <ul style="list-style-type: none"> - Other sources of income (advertisements) - Contractual particularities - Deviations from the overall building condition - Land plot value based on comparison approach 	Comparables are selected based on: <ul style="list-style-type: none"> - Location (macro/micro) - Type of use - Land plot characteristics - Net/Gross rental income - Usable area Results are adapted based on: <ul style="list-style-type: none"> - Condition of the real estate market - Temporal proximity of the transactions

Source: Own illustration.

Considering the overview of the two standardized valuation approaches, there is obviously a wide spectrum of subjective impressions and objective data that finds its way into a property valuation. Both methods mainly build upon locational factors of the property, its rental income, its size in terms of its usable area, and its overall condition regarding maintenance and usability. However, the selection of potential covariates of a property's 'Brand Status' that can be taken into account in this study is limited by data availability. Based on this, the following discussion focuses on property characteristics that, on the one hand, are reflected in the valuation methods and, on the other hand, are covered by the data source.

'City Size' (independent variable): Location as a unique and individual characteristic of every property is a major determinant of an office building's market value and as such, is reflected in all valuation approaches. It can be assumed that even completely equal properties depict variances in their market value if they are located at different places. On a micro level, location mainly depends on the neighborhood structure and accessibility of a subject property and the infrastructure available in its nearby surroundings. On a macro

⁴²¹ See Immobilienwertermittlungsverordnung – ImmoWertV (2010), Wertermittlungsrichtlinien – WertR (2006), including its amendments Sachwertrichtlinie – SW-RL (2012) and Vergleichswertrichtlinie VW-RL (2014), for the legislative background of German property valuation approaches.

⁴²² See the full work of KLEIBER/FISCHER/WERLING (2013).

level, the size and socioeconomic structure of the macro location are considered in property valuations, since these factors determine the size and structure of the corresponding real estate market. Metropolitan areas with a large number of inhabitants such as Berlin, Hamburg, or Munich usually display different market dynamics and volumes than smaller cities or villages in rural areas.⁴²³ Unfortunately, the dataset obtained from the IPD does not cover a detailed assessment of properties' locational factors and only captures the postcode area and city in which a specific building is located. For this reason, the size of cities is selected as a basic constitutive characteristic of properties' macro location and is included in this study as a potential covariate of 'Brand Status'.

The ordinal variable 'City Size' refers to the number of inhabitants of the city in which a property is located. On the basis of the population data obtained from the German *Zensus 2011*, the cities in the dataset were assigned to four categories: 1 (<250,000 inhabitants), 2 (250,000 to <500,000 inhabitants), 3 (500,000 to <1,000,000 inhabitants), and 4 ($\geq 1,000,000$ inhabitants).⁴²⁴

Rent (independent variable): When considering factors that are associated with a property's value, the contractual situation of the tenancies and, in particular, the rental income are normally at the focus of interest. From an investment perspective, a certain rental price promises corresponding, future cash flows that are, in turn, reflected in a respective property value.⁴²⁵ In this study, the continuous variable 'Rent' reflects the net rental price reported by the database participants as stated in the lease contract in Euro-per-square-meter. Consequently, incentives such as rent-free months or tenant-specific refurbishments and modifications are not taken into account.

Building Age (independent variable): Both valuation approaches account for properties' overall quality and maintenance condition as a reflection of their marketability regarding tenants' requirements. Properties may exhibit substantial variations in their performance if they differ in their technical and functional quality or their architectural appearance. An older building that does not meet today's requirements might see discounts in the course of a valuation.⁴²⁶ Unfortunately, the IPD database does not contain direct information on properties' building standard and maintenance condition. However, the dataset captures the buildings' economic year of construction, which is the year of their development or last comprehensive modernization, and thus, can be considered as an indicator of the respective building's overall condition and appearance.

On that score, 'Building Age' is included as a covariate of 'Brand Status' in this study. This continuous variable measures the time span since the development, last refurbishment, or revitalization of the property in years. It should be stated that this variable is potentially prone to inaccuracies, namely possibly, database participants have not kept precise records of all modernizations, and successive long-term measures might not be captured cor-

⁴²³ See BEIDATSCH (2008), pp. 7-11; VÄTH/HOBERG (2005), pp. 363-367.

⁴²⁴ A split of the third category into two equally large classes seemed impractical, since there were no German cities with a population between 750,000 and 1,000,000 inhabitants at the time of the study.

⁴²⁵ See SCHULTE/ROPETER-AHLERS (2005), p. 395; VÄTH/HOBERG (2005), pp. 386-387.

⁴²⁶ See ERTLE-STRAUB (2002), pp. 61-66; OEPEN (2000), pp. 351-353; BRADE (1998), pp. 224-231; ABEL (1994), p. 28.

rectly. After all, there is no strict guideline to determine whether or not a certain measure leads to a notable change in a property's economic year of construction.

'Usable Area' (independent variable): Properties' usable area is taken into account in both valuation approaches as a measure of size in square meters and refers to the floor space that can be fully used and rented out. Common areas such as entrances, stairways, lifts, and hallways, as well as functional areas such as boiler rooms, machine rooms, and technical rooms, are excluded. In German real estate practice, floor space measurements usually follow the "*Richtlinie zur Berechnung der Mietfläche im gewerblichen Raum (MF/G)*" guideline, which was developed by the GESELLSCHAFT FÜR IMMOBILIENWIRTSCHAFTLICHE FORSCHUNG E.V. and is based upon the German DIN 277 standard.⁴²⁷ Obviously, the size of a property is related to its total value, since it determines the space that can be used by tenants. Moreover, the usable area may have an influence on the market value per square meter, since a property's spatial concept, which is potential users focus on, strongly depends on the available usable area. In the same way, larger properties might be managed differently than smaller properties, leading to value differentials.⁴²⁸

Consequently, 'Usable Area' is taken into account in this study as an additional independent variable. The IPD Investment Property Databank assigns all properties to different size classes so as to prevent individual identifications in accordance with their security standards. Thus, properties' usable area is measured on a scale of 1 (<5,000 m²), 2 (5,000 to <10,000 m²), 3 (10,000 to <15,000 m²), and 4 (≥15,000 m²).

Year (independent variable): Finally, the valuation date must be considered. According to the German legal definition, a property's value refers to a certain point in time. Thus, property valuations are always a snapshot of a building in its market environment at a specific date.⁴²⁹ Moreover, the cyclicity of office space markets might lead to variances in the effectiveness of brands over time suggesting to control for the year of observation. In this study, the variable 'Year' takes into account the longitudinal character of the IPD dataset and defines the year of observation from which the data is obtained. The database covers the years 2006 to 2012, and the scale of the variable was chosen to be 0 (first year of observation, 2006) to 6 (last year of observation, 2012).

3.2.3 Data Structure

Looking at the structure of the dataset, a nested hierarchy can be identified: Individual measurement variable occasions from 2006 to 2012 belong to specific properties. Each property is in turn located in a certain postcode area that can be assigned to a specific city. Obviously, the different elements of the sample (measurement occasions, properties, postcode areas, cities) are located at different levels that follow a linear nested hierarchical structure. For this reason, it must be assumed that measurements from within one element are more similar to each other than measurements from two different elements at the same level due to common influencing factors, for example, measurements of 'Value'

⁴²⁷ See GESELLSCHAFT FÜR IMMOBILIENWIRTSCHAFTLICHE FORSCHUNG E.V. (2012), pp. 6-8; DIN Deutsches Institut für Normung e.V. (2005), DIN 277-2, pp. 2-7.

⁴²⁸ See VÄTH/HOBERG (2005), pp. 376-381; PSEPHOS (2004), pp. 8-13; Dent/White (1998), pp. 268-270.

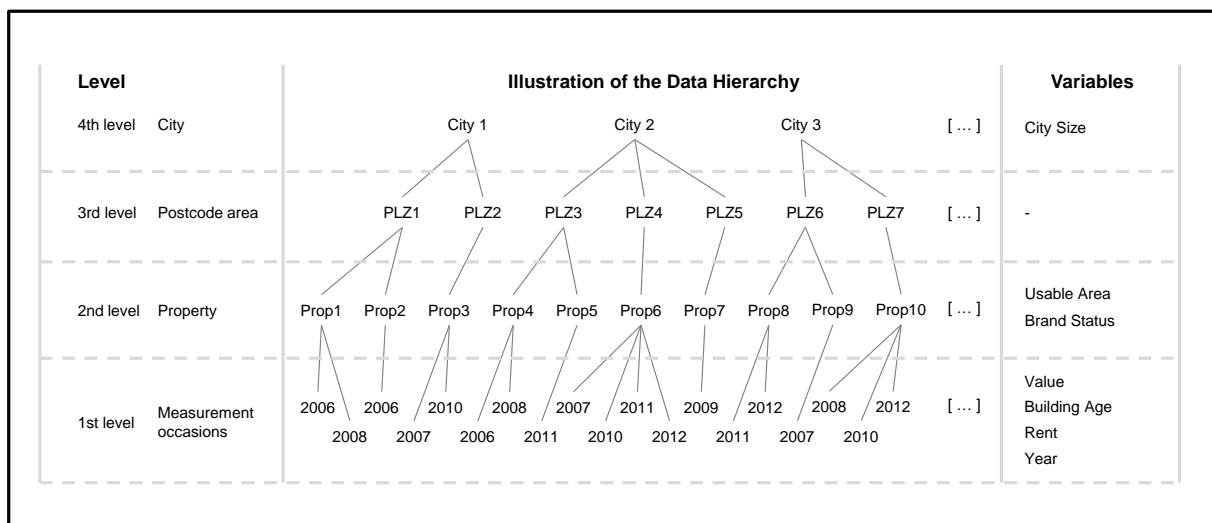
⁴²⁹ See LEOPOLDSBERGER/SAFFRAN (2005), p. 431-432; BAUGESETZBUCH – BauGB (2004), §194.

from two different years tend to be more similar when they refer to the same property than measurements of 'Value' from two distinct buildings, since they are based on the same characteristics and value drivers. In accordance with this hierarchical structure, the study variables can be clearly assigned to different levels. Figure presents an overview of the data and variable structure.

At the lowest level (measurement occasion level) are the dependent variables 'Value' and independent variables 'Year of Observation', 'Building Age', and 'Rent' are measured. The property level comprises the independent variables 'Brand Status' and 'Usable Area'. Both variables might vary across properties, but are stable across measurement occasions.

No variables are obtained at the third level (postcode level). The dataset does not contain information on micro location characteristics such as infrastructure, accessibility, and neighborhood structure. However, it might be possible that this level is relevant for the data analysis, since part of the variance of the outcome variable might be attributable to these unobserved influencing factors. Due to this lack of variable measurements, no conclusions on specific contributions to variance explanation can be made on this level. Nevertheless, the postcode level should be incorporated in the data structure in order to account for similarities between properties in the same postcode area.

Figure 14: Hierarchical Structure of the Data Set



Source: Own illustration.

At the city level, the variable 'City Size' is measured. The variable is stable for all postcode areas, properties, and measurement occasions within a certain city, but varies across cities.

With that in mind, empirical observations are evidently not independent from each other. Thus, a basic requirement for the application of a range of common statistical methods is not fulfilled. A violation of the assumption of independence leads to biases in the estimation results and incorrect calculations of confidence intervals and significance levels.⁴³⁰ SIXT (2010) notes that insignificant differences in the population study might be erroneously significant in the sample. As a consequence, phenomena may be transferred to the

⁴³⁰ See KRAUS (2008), p. 208.

population even if they are insignificant.⁴³¹ Similarly, DITTON (1998) states that when hierarchical data structures are neglected, the coefficients of a simple regression model are a mixture of effects within and between nested groups, which does not allow for a precise interpretation.⁴³²

The potential drawbacks of not taking into account the structure of the dataset strongly emphasize the need for an appropriate methodology. For this reason, multilevel modeling is chosen for the analysis in this study in order to account for the longitudinal and locational character of the real estate data. The methodology is explained in more detail in Chapter Fehler! Verweisquelle konnte nicht gefunden werden..

3.2.4 Preparation of the Final Data Set

For the purpose of this study, the dataset provided by the IPD Investment Property Data-bank was limited to observations from cities with 100,000 inhabitants or more that contain at least one branded and one non-branded property. In doing so, the study focuses on regional markets that have at least a minimum relevance for real estate practitioners due to their market volume.

The dataset comprised of 4,319 individual observations on measurement occasion levels from 1,163 properties located in 276 postcode areas in 20 cities. All cases were complete on all variables and did not contain missing values. For some properties, observations were not available for every year of the study horizon. However, since multilevel modeling does not require a balanced dataset, an uneven number of measurements for the properties does not affect the analysis.⁴³³

According to HOX (2010), all covariates of 'Brand Status' were centered on their grand mean before calculating interaction effects and conducting the multilevel analysis.⁴³⁴ The binary variable 'Brand Status' has a meaningful parameter value 0 (identifying a non-branded property) and remains uncentered. In this way, estimates of the intercept and coefficients refer to a non-branded property that has an average parameter value in all covariates. Moreover, covariances between variance components of the intercept and slopes are reduced.⁴³⁵

In a first model estimation, the dependent variable caused serious convergence problems. Following the recommendation of TABACHNICK/FIDELL (2007), 'Value' was log-transformed into 'Logvalue' on the basis of the natural logarithm. With this step, model convergence

⁴³¹ See SIXT (2010), p. 183.

⁴³² See DITTON (1998), p. 29. A more detailed discussion of potential fallacies associated with an erroneous analysis strategy in cases with hierarchical data can also be found in LANGER (2009), pp. 21-23.

⁴³³ See HOX (2010), S. 79.

⁴³⁴ The centering-within-context approach was not applied in this study, since the effect of a variable is the main focus of interest and not the differences between groups. In addition, the centering-within-context leads to changes in the coefficients, resulting in an unnecessary complication of the interpretation. See HOFMANN/GAVIN (1998), pp. 623-641 and KREFT/DE LEEUW/AIKEN (1995), pp. 1-21 for a discussion of the different centering strategies and their effects in multilevel modeling.

⁴³⁵ See URBAN/MAYERL (2011), pp. 237-240; HOX (2010), 61-63.

was achieved, and the deviation from normal distribution was reduced.⁴³⁶ However, the interpretation of the results must account for this transformation. In order to facilitate the interpretation, the subsequent analysis covers both the log-transformed parameter values and the back-transformed results.⁴³⁷

Univariate outliers for the variables were identified for each city separately based on the interquartile range. A one-and-a-half time interquartile range was set as a cut-off value for potential outliers while a triple interquartile range was considered as a criterion for extreme values.⁴³⁸ All outliers and extreme values were checked against corresponding office property market reports from their respective cities and discussed with an independent valuation expert from EY Real Estate, a company offering real estate consultancy and valuation services.⁴³⁹ Altogether, 22 univariate outliers were identified that could be mainly attributed to incorrect data entry. Regarding 'Value' and 'Rent' outliers, some parameter values seemed unrealistic considering the market situation, common sales prices, and rental levels.

Multivariate outliers were examined at the city level. For this purpose, a simple regression containing all predictors and the outcome variables was carried out. Cook's distance was applied as a measure that combines residuals and leverage in order to determine observations with a high level of influence on the estimated coefficients. Observations with a Cook's distance higher than $4/(n-k-1)$ (where k is the number of independent variables, and n is the size of the sample) were considered to be suspect and then reviewed in more detail.⁴⁴⁰ Again, the multivariate outliers were checked for their conformity with common market standards with the help of office market reports and an expert discussion. Moreover, their consistency with all other observations from the same property was assessed in order to uncover unrealistic developments and potential gaps between measurement occasions. This way, 10 multivariate outliers were identified.

Based on HOX (2010) and FERRON et al. (2004), an inspection of the residuals was carried out after an initial model estimation was made in order to complement the examination of

⁴³⁶ See TABACHNICK/FIDELL (2007), p. 87-88.

⁴³⁷ The geometric mean is argued to have an advantage over the arithmetic mean in skewed populations, since this measure is less affected by extreme values and remains approximately equal to the median of the distribution while being smaller than the arithmetic mean. Regarding the interpretation of analysis results, the following should be taken into account: After back-transformation of the arithmetic mean of the log-transformed variable 'Logvalue', the resulting antilog is the geometric and not the arithmetic mean of the original variable 'Market Value' (i.e. $\bar{x}_g = e^{\bar{y}}$). Similarly, in regression analyses, the exponentiated regression coefficients correspond to proportional changes in the expected geometric means of the original outcome variable. The percentage change in the geometric mean of the dependent variable is calculated as $(e^{\beta}-1) \times 100$. See OLIVIER/JOHNSON/MARSHALL (2008), p. 335; SPIZMAN/WEINSTEIN (2008), pp. 43-48; VOß et al. (2004), pp. 123-127. See also UCLA Statistical Consulting Group (2014), for an extended discussion on the interpretation of log-transformed dependent variables in mixed transformed regression analysis.

⁴³⁸ See DAWSON (2011), pp. 2-3.

⁴³⁹ Real estate market reports are usually published by real estate agencies and are freely available online. For the purpose of the outlier assessment, market reports from Jones Lang LaSalle, CB Richard Ellis, and Colliers were reviewed, covering the sample cities and time horizon.

⁴⁴⁰ See HAIR et al. (2010a), p. 11; TABACHNICK/FIDELL (2007), p. 75.

univariate and multivariate outliers.⁴⁴¹ Standardized residuals were determined and examined visually using both quantile-quantile and scatter plots of residuals against fitted values. Residuals with a value of below -3 or above 3 were considered suspect and reviewed closely from a real estate market perspective. By this means, 54 observations were detected that were characterized by parameter values and combinations of parameter values that appeared unusual compared to market conditions.

Referring to TABACHNICK/FIDELL (2007), the variables that distinguish the multivariate outliers from the rest of the dataset were identified. A dummy variable for the outlier status was introduced (0 = no outlier, 1 = outlier), and a regression was applied using all variables as predictors of the outlier status.⁴⁴² For 'Logvalue' (-0.053, $p < 0.000$), 'Year of Observation' (-0.003, $p < 0.01$), and 'Rent' (0.0003, $p < 0.000$), a significant relationship with the dummy variable was estimated. Thus, a lower market value, higher rental level, and an earlier year of observation seem to be associated with a higher probability of being an outlier. From a real estate perspective, a combination of high rental prices and a low market value might hint at situations where the contract rent is clearly above market level or substantial incentives were promised to the tenants. Other reasons might be discrepancies between the rental situation of a property at the time of data delivery and the last valuation, or higher shares of non-office space, leading to a different relationship between the rental level and market value of a property.

Altogether, approximately 2% of the total number of observations were identified as outliers and eliminated from the dataset. The majority was attributable to erroneous data entries, since parameter values seemed highly unrealistic regarding common market standards in German office markets. Other outliers showed an untypical combination of parameter values, indicating that the underlying properties might be characterized by extraordinary circumstances such as specific architectural traits, unique locations or uncommon tenancy, and contractual structures. In these cases, it is doubtful whether the respective observations are representatives of the study population. Consequently, the loss of information from eliminating the outliers from the data seemed negligible.⁴⁴³

Following a suggestion by RAMSEY (1969), a Regression Equation Specification Error Test (RESET) was conducted on the basis of a regression including the full set of independent variables and a 'Market Value' log as the dependent variable. The test was not significant, indicating that the model specification can be expected to be correct.⁴⁴⁴

The independent variables were tested for multicollinearity, examining the variance inflation factor (VIF). Variance inflation factors were below a value of 3 for all predictors. A mean variance inflation factor of 1.56 was calculated. Perhaps most commonly, a value of 10 is recommended as a cut-off criterion, which corresponds to a tolerance of 0.1 (i.e.

⁴⁴¹ See HOX (2010), pp. 26-27; FERRON et al. (2004), p. 13. It must be stated, that this approach can be seen critically, since it might lead to a subsequent retrofitting of the analysis results. TABACHNICK/FIDELL (2007), p. 77 recommend that this method should only be used in exploratory analyses. In order to limit the risk of retrofitting, the procedure was applied only once. A second residual inspection based on a refitted model resulted in a slight improvement of residuals' deviance from normal distribution, but the significances of all coefficients remained unchanged.

⁴⁴² See TABACHNICK/FIDELL (2007), p. 76.

⁴⁴³ See HAIR et al. (2010b), pp. 64-68.

⁴⁴⁴ See RAMSEY (1969), pp. 361-362.

1/0.1=10).⁴⁴⁵ However, requirements of 5, 4 and 3.3 are also found in the literature.⁴⁴⁶ With that said, the variance inflation factors determined for the independent variables of this study seem acceptable and a problematic level of multicollinearity is not expected.

3.2.5 Description of the Final Data Set

From 2006 to 2012, a total of 520 branded and 3,713 non-branded observations were covered in the final dataset, equaling 10.6 million square meter of usable area and a total market value of 27.3 billion Euros. For each year of the study horizon, this corresponds to an average of 74 branded and 530 non-branded observations, a usable area of approx. 1.5 million square meters,⁴⁴⁷ and a market value of approximately 3.9 billion Euros.⁴⁴⁸

From a structural perspective, a hierarchy of nested groups was identified. There are 4,233 observations at the measurement occasion level that belong to 1,118 properties. The properties are located in 273 different postcode areas from 20 cities in Germany. Table summarizes the number of groups on the four levels and the corresponding number of single observations.

Table 6: Overview – Number of Groups and Observations

Level	No. of groups	Observations per group		
		Min.	Max.	Avg.
4th level (cities)	20	17	746	211.7
3rd level (postcode areas)	273	1	128	15.5
2nd level (properties)	1,118	1	7	3.8
1st level (measurement occasions)	4,233 (total observations)			

Source: Own illustration.

Table provides an overview of the dataset variables and Figure contains the corresponding histograms. For reasons of interpretability, parameter values refer to the uncentered and untransformed variables at this point.

Table 7: Overview – IPD Data Set after Elimination Procedure

⁴⁴⁵ See HAIR et al. (2010b), p. 204.

⁴⁴⁶ See HAIR et al. (2014), p. 125; LAWRY/GASKIN (2014), p. 137; GARSON (2012), p. 45; DIAMANTOPOULOS/SIGUAW (2006), p. 270.

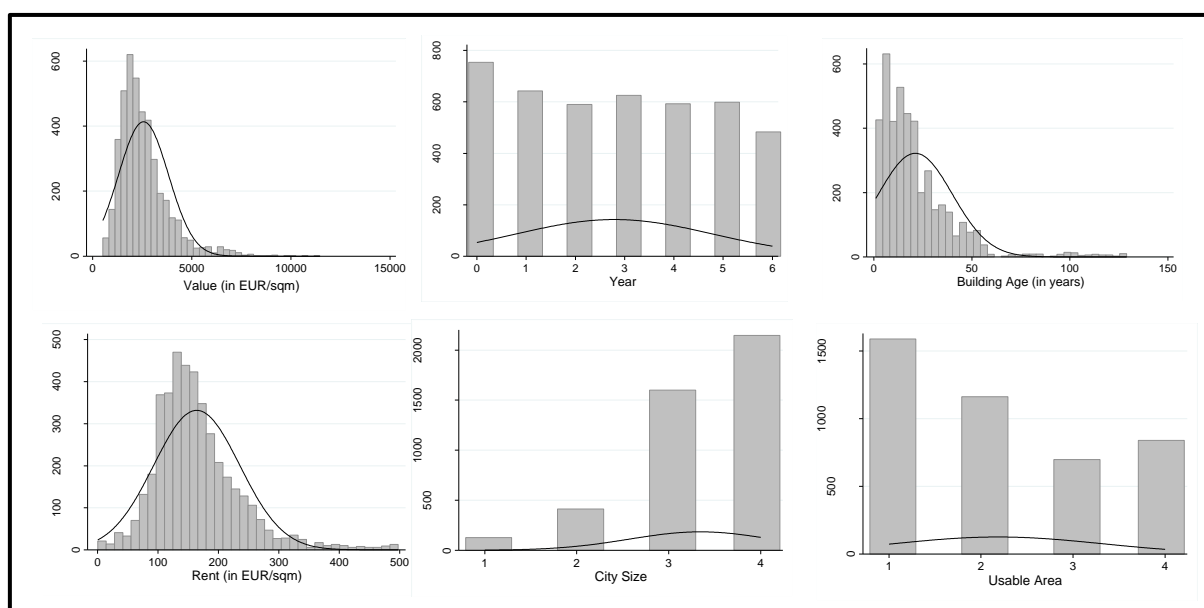
⁴⁴⁷ The total amount of office space in Germany was estimated with 311.2 million square meters. See Deutscher Verband für Wohnungswesen, Städtebau und Raumordnung e.V./Gesellschaft für Immobilienwirtschaftliche Forschung e.V. (2012), p. 27.

⁴⁴⁸ The exact size of the properties was unknown due to data security standards. For this reason, the estimation of the total market value in the dataset was based on the mean category ranges. An average usable area of 30,000 square meters was assumed for the category $\geq 15,000$ square meter.

Variable	Min.	Max.	Mean	Standard deviation
Value	518.00	11,470.00	2,574.512	1,257.720
Year of observation	0	6	2.798	1.998
Building age	1	129	20.990	18.698
Rent	0.5	497.7	164.270	70.770
Brand status	0	1	0.122	0.328
Usable area	1	4	2.186	1.133
City size	1	4	3.346	0.772

Source: Own illustration.

Figure 15: Histograms of Data Set Variables



Source: Own illustration.

Property market values show a broad spectrum between 518 EUR/m² up to 11,470 EUR/m² with a mean of app. 2,575 EUR/m². This span seems realistic from a real estate point of view, since a range of office properties in different cities are covered in the dataset. The frequency distribution of the year of observation shows that the number of observations varies from year to year and decreases across the study horizon. Changes in the overall number of database participants or in their willingness to contribute might be potential reasons for this development. Most likely, the limited number of observations obtained in the last year (2012) can be attributed to delays of participants' data delivery.

Building Age varies between 1 and 129 years with a mean of app. 21 years. The histogram indicates that properties that were built before the year 1990 only represent a minor share (app. 32.5%) of the observations. Obviously, the IPD Investment Property Databank sample consists of relatively modern office buildings in comparison to the German market. According to estimations for the total office market, a share of 70.6% was built before 1990.⁴⁴⁹

⁴⁴⁹ See Deutsche Hypothekenbank (2013), p. 10.

Parameter values for the variable 'Rent' lie between 0.5 EUR/m² and 497.7 EUR/m² with a mean of 164.3 EUR/m². The histogram shows that a majority (59.9%) of the observations is below the mean rent. Across the horizon of the study, average office rents in the German market varied between app. 148.8 EUR/m² and app. 154.8 EUR/m², suggesting that the sample mean is approximately in line with the mean of the total market.⁴⁵⁰ Looking at the mean parameter value of 'Brand Status', one can state that app. 12.2% of the observations refer to branded properties. Regarding the usable area, properties with a usable floor space of less than 10,000 square meters apparently account for 65.6%.

The frequency distribution of the city size variable implies that the sample is mainly based on observations from larger cities. In fact, this generally corresponds with the focus of the German office market that is clearly dominated by the seven largest sub-markets of Berlin, Düsseldorf, Stuttgart, Frankfurt/Main, Hamburg, Munich, and Cologne. However, with a share of 80.9% of the total number of observations, these cities are overrepresented in comparison to the German office market where these cities account for app. 28.5% (88.6 million square meters).⁴⁵¹ A detailed overview of the observations per city is provided in Table .

Altogether, the data sample seems to be an appropriate representation of the office market in larger German cities. However, relatively young properties and buildings with a usable area below 10,000 square meters seem to be overrepresented. Some of the original variables apparently deviate from normal distribution. This does not necessarily endanger the applicability of multilevel analysis, since only residuals are assumed to approximate normality. The overall appropriateness of the dataset regarding the requirements of multilevel modeling is discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden..** Post estimation residual tests are outlined in Section **Fehler! Verweisquelle konnte nicht gefunden werden..**

Table 8: Overview – Number of Observations per City

⁴⁵⁰ See IPD Investment Property Databank (2014), p. 2.

⁴⁵¹ See Deutscher Verband für Wohnungswesen, Städtebau und Raumordnung e.V./Gesellschaft für Immobilienwirtschaftliche Forschung e.V. (2012), p. 27 and Jones Lang LaSalle (2014), p.3.

City	Number of Observations	Percent	Cummulative
Hamburg	746	17.6%	17.6%
Frankfurt/Main	584	13.8%	31.4%
Munich	580	13.7%	45.1%
Düsseldorf	441	10.4%	55.5%
Berlin	402	9.5%	65.0%
Cologne	394	9.3%	74.3%
Stuttgart	276	6.5%	80.9%
Bonn	125	3.0%	83.8%
Wiesbaden	101	2.4%	86.2%
Hannover	95	2.2%	88.4%
Dortmund	87	2.1%	90.5%
Essen	77	1.8%	92.3%
Mannheim	67	1.6%	93.9%
Nuremberg	64	1.5%	95.4%
Karlsruhe	47	1.1%	96.5%
Freiburg	40	0.9%	97.5%
Ludwigshafen	37	0.9%	98.3%
Mainz	32	0.8%	99.1%
Leipzig	21	0.5%	99.6%
Offenbach	17	0.4%	100.0%
Total	4,233	100.0%	

Source: Own illustration.

3.3 Methodology

Multilevel modeling was chosen for the analysis in order to account for the hierarchical structure of the dataset. In an initial step, this section explains the fundamentals of multi-level analysis and discusses assumptions and requirements of the method. Afterwards, the section outlines the model estimation approach and explains ways to determine the significance of effects, the overall model fit, and the variance explained by the model. Finally, the model development and analysis strategy for this study is presented.

3.3.1 Fundamentals of Multilevel Analysis

Multilevel models have widely gained acceptance over the past 20 years in many fields, including medicine, biology, and social sciences as an important methodology for dealing appropriately with nested or clustered data.⁴⁵² The underlying idea is that datasets can have hierarchical structures where elements can be attributed to distinct levels that are linearly nested within each other.⁴⁵³ Typical examples are pupils within classes within

⁴⁵² See SIXT (2010), p. 183; DRAPER (2008), p. 77; WIESEKE (2004), pp. 232-234.

⁴⁵³ Elements from lower levels can also be assigned to more than one of the context levels that are not nested within each other. Children might, for instance, belong to different schools and neighborhoods at the same time. However, this variation of multilevel models is not relevant for this study. For a more detailed discussion of cross-classified multilevel models, see HOX (2010), pp. 171-187.

schools, individuals within households within regions, cows within farms, measurement occasions within individuals, individuals within couples within cultures, and employees within companies.⁴⁵⁴ In real estate research, multilevel modeling has been scarcely applied so far, even if real estate markets are clearly characterized by a spatial structure.⁴⁵⁵

As a consequence of this structure, observations within one context cannot be expected to be independent, since they are subject to joint influencing factors. Thus, in this study, measurement occasions within one property are jointly affected by the building's appearance, structural flexibility, and architecture while properties within one postcode area may underlie a common infrastructural and socio-economic development.

Traditional approaches towards handling hierarchical data structures are prone to biases and fallacies. Data aggregation builds upon calculating means for lower level elements in order to derive higher level parameter values. Consequently, a substantial loss of information can be expected, since variances of lower level variables are neglected in this case. When data disaggregation is applied, observations from higher levels are assigned to their lower level elements. In this manner, cases are multiplied, leading to respective biases in standard errors and statistical conclusions.⁴⁵⁶

Multilevel analysis, which builds upon classic ordinary-least-square-regression, avoids these disadvantages. In multiple linear regression, all observations have the same intercepts and slopes. In multilevel analysis, two aspects are added to this model: (1) All observations are assigned to a specific group. Consequently, in this study, for instance, each measurement of market value is assigned to a certain property, which is assigned to a specific postcode area that is related to a single city. (2) The model allows for intercept and slope to vary, depending on the context. For this study, the relationship between brand status and market value, for example, might differ between properties, postcode areas, and cities.^{457/458}

For this, the method accounts for variances on two or more levels and allows relationships between individual or context level variables and a dependent variable on the lowest level to be investigated. Moreover, interaction effects between variables on different levels can be examined, and the total variance explained can be attributed to different levels.⁴⁵⁹ That being said, multilevel analysis has three major advantages for the study of brand status and its relationship with property market values: (1) The longitudinal and regional character of the real estate data can be modeled appropriately. As a result, the relationship between 'Brand Status' and the dependent variable can be examined without the shortcomings and potential fallacies arising from traditional single level regression is based on a pooled dataset. (2) The relationship between the covariates and properties' market value

⁴⁵⁴ See GUNKEL (2010), pp. 100-101; HOX (2010), p. 1-2, 32, 79; IVEMEYER (2010), pp. 61-63; GLOGER (2007), p. 226; DITTON (1998), p. 3.

⁴⁵⁵ See HAASE (2011), pp. 120-122.

⁴⁵⁶ See SNIJDERS/BOSKER (2012), pp. 14-17; HOX (2010), pp. 2-4; KRAUS (2008), p. 209; VAN DICK ET al. (2005), p. 28.

⁴⁵⁷ Coefficients that are not modeled to vary between contexts are referred to as fixed effects. Random effects are allowed to differ from context to context.

⁴⁵⁸ A more detailed discussion on model development is provided in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**

⁴⁵⁹ See SNIJDERS/BOSKER (2012), pp. 1-2; SIXT (2010), p. 184; LANGER (2009), pp. 20-23.

as well as potential interaction effects with 'Brand Status' can be taken into account according to the hierarchical structure. (3) Differences in coefficients between properties, postcode areas, and cities can be uncovered.

3.3.2 Model Assumptions and Data Set Requirements

In general, multilevel modeling relies on the basic assumptions of general linear models such as normality, homoscedasticity, and linearity.⁴⁶⁰ Furthermore, applying multilevel analysis is only necessary when there are substantial differences between groups. Beyond these assumptions, the dataset should fulfill certain requirements regarding the sampling.

Normal distribution, homoscedasticity and linearity: Residual error terms on the lowest level are assumed to be normally distributed with a mean value of zero and variance σ^2 . Similarly, residual error terms for random effects on higher levels are assumed to approximate multivariate normal distribution. Residual variances on all levels are assumed to be constant across different parameter values of the explanatory variables.⁴⁶¹ For this study, no substantial violations of these requirements were identified. The corresponding results of a post estimation analysis of residuals are provided in Section **Fehler! Verweisquelle konnte nicht gefunden werden..**

Hierarchical linear modeling assumes linear relationships between predictors and the outcome variable. A visual inspection of bivariate scatter plots and locally weighted scatter plot smoothing curves for all independent variables and 'Logvalue' came to the conclusion that linear relationships can be assumed.⁴⁶² Appendix 1 displays the corresponding scatter plots.

Independence of errors: The assumption of independence is not retained, since multilevel analysis explicitly models group effects at different levels. In fact, multilevel modeling is only advised when the assumption of independence of errors is violated, resulting in significant differences between groups. Whether or not multilevel modeling should be applied is tested on the basis of the Intraclass Correlation Coefficient (ICC) that measures the ratio of variance on context level and the total variance within those contexts. In this way, the ICC indicates the share of variance that is explained by the grouping structure and is an indicator of the degree of heterogeneity between contexts. Thus, it can also be interpreted as the maximum proportion of variance that can be explained by adding predictors on a specific level.⁴⁶³ Formula shows the corresponding equation.

⁴⁶⁰ For reasons of space and the focus of the study, this section only emphasizes particularities of multilevel modeling in more depth at this point. See, for instance, TABACHNICK/FIDELL (2007), pp. 78-85 for a more detailed discussion of assumptions in general linear models.

⁴⁶¹ In fact, KORENDIJK et al. (2008) found that, in a two-level model with unequal variances, only the second level standard error of the second level variance is underestimated. There were no substantial biases of fixed effects, first level variances, and their standard errors. Nevertheless, heteroscedasticity can also be explicitly integrated in multilevel models. See SNIJDERS/BOSKER (2012), pp. 119-129, 161 for a detailed discussion of ways to model heteroscedasticity.

⁴⁶² For a detailed explanation of locally weighted scatter plot smoothing, see CLEVELAND (1979), pp. 829-836.

⁴⁶³ See BRAUN et al. (2010), pp. 23-24; HOX (2010), p. 15; TABACHNICK/FIDELL (2007), p. 788.

Intraclass correlation coefficients near zero suggest that applying multilevel modeling is not necessary, since there is no substantial variance between contexts. For this study, significant differences between contexts were found on all levels, indicating that a multi-level modeling approach is reasonable. A discussion of the results is provided in Section Fehler! Verweisquelle konnte nicht gefunden werden..

Formula 1: Population Intraclass Correlation Coefficient

$$\rho = \frac{\sigma_{u_0}^2}{\sigma_{u_0}^2 + \sigma_e^2}$$

ρ = intraclass correlation coefficient

$\sigma_{u_0}^2$ = variance of higher-level error σ_{u_0}

σ_e^2 = variance of lowest-level error σ_e

Source: Hox (2010), p. 15.

Random sample: On all levels, observations should be based on a random sample. Obviously, this assumption is not met in many cases. Especially in studies where regional or social structures are taken into account, then random sampling is often impracticable. BRAUN et al. (2010, S. 20) point out that this aspect is commonly neglected in research, and context and single observations are usually treated as being drawn randomly. However, inferences should not be made beyond the sample groups in these cases.⁴⁶⁴ In this work, the assumption is violated as well due to data availability restrictions and the prevalent concentration of real estate markets on specific regions. A random selection of property sub-markets would not have been acceptable from a real estate perspective, since it might lead to a neglecting of Germany's largest office markets. In accordance with standard practices, the sample is subsequently treated as being random, but special attention is paid to the corresponding limitations of the study results.⁴⁶⁵

Sample size: The number of observations at the different levels in a data hierarchy, which are needed in order to obtain valid standard error estimations, is something that is continuously being discussed. Especially suggestions concerning the number of groups on higher levels strongly vary. MAAS/HOX (2005) state that estimations of standard errors are too small in cases where the number of higher level contexts is below 50. However, the authors suggest that, even with 30 observations at the context level, acceptable results might be achieved, although these might be less precise. According to SNIJDERS (2003), less than 20 cases substantially limit the power of analysis results, and "sample sizes less than 10 should be regarded with suspicion"⁴⁶⁶.

Based on a Monte Carlo simulation, STEGMUELLER (2013) similarly states that in complex multilevel models with higher level predictors and interaction effects, a group sample be-

⁴⁶⁴ See BRAUN et al. (2010), pp. 20-21; HINZ (2005), p. 269. See also LUCAS (2014), pp. 1619-1649 for a detailed discussion of this matter, and GHITZA/GELMAN (2013), pp. 763-764 for an application of poststratification as a potential approach to generalize results from multilevel analysis.

⁴⁶⁵ See HOX (2010), p. 1.

⁴⁶⁶ SNIJDERS (2003), p. 676.

low 20 results in confidence intervals that are almost 5% too short.⁴⁶⁷ For studies focusing on random effects, SNIDERS/BOSKER (2012) suggests a sample size of 30 or higher.⁴⁶⁸ However, depending on the field of study, the sample size available might be limited. Especially in studies with a geographic component, research publications apply to multilevel modeling of data structures with a relatively small number of groups at the highest level. BRAUN et al. (2010) list several studies with a sample size between 16 and 35 at the context level. In their own study, the authors build upon 27 cases (Members of the European Union).⁴⁶⁹

Sample size requirements are less restrictive on the lower levels. GELMAN/HILL (2007) state that, if a certain degree of inaccuracy is accepted, "even two observations per group is enough to fit a multilevel model."⁴⁷⁰ Equally, DITTON (1998) suggests a group size of at least two observations, and MOSSHOLDER/BENETT/MARTIN (1998) recommend a minimum number of three observations per group.⁴⁷¹ In repeated measure analysis, any lacking measurements can be tolerated so that for longitudinal studies, "(...) group sizes may be as small as one, as long as other groups are larger (...)." ⁴⁷²

Until now, no uniform convention on sample size has been developed, and there is "(...) no strong evidence to guide researchers in their multilevel design decisions."⁴⁷³ However, there is general agreement that (1) the number of observations on higher levels is more important than on lower levels, (2) the sample size that matters most refers to the level on which the effect of interest is measured, and (3) the average cluster size is of minor importance for the power of multilevel analyses.⁴⁷⁴

In this study, the general sample size requirements are fulfilled. An amount of 1,118 observations are available at the property level, where the effect of brand status is measured. However, it should be noted that, at city level, only 20 cases were considered in the dataset. Even if there is only one independent variable assigned to this level, results concerning random effects and cross-level interactions should be interpreted carefully, since estimated standard errors might be too small, leading to potential biases.

3.3.3 Model Estimation and Covariance Structure

In hierarchical data structures, the requirement for the independence of observations and thus, for the independence of errors that is assumed to be ordinary-least-squares estimations, is not fulfilled. Therefore, the maximum-likelihood-method is commonly applied to estimate multilevel models.⁴⁷⁵ For this, two different approaches are in use: (1) the full-

⁴⁶⁷ See STEGMUELLER (2013), p. 758.

⁴⁶⁸ See SNIJDERS/BOSKER (2012), p. 191.

⁴⁶⁹ See BRAUN et al. (2010), p. 21.

⁴⁷⁰ GELMAN/HILL (2007), p. 276.

⁴⁷¹ See DITTON (1998), p. 76; MOSSHOLDER/BENETT/MARTIN (1998), pp. 131-133.

⁴⁷² TABACHNICK/FIDELL (2007), p. 788.

⁴⁷³ MAAS/HOX (2005), p. 87.

⁴⁷⁴ For a detailed discussion of sample sizes in multilevel models, see, for instance, SNIJDERS/BOSKER (2012), pp. 176-193, MAAS/HOX (2005), pp. 86-92, and SNIJDERS (2005), pp. 1570-1573.

⁴⁷⁵ Generalized least squares, general estimation equations, the Bayesian estimation, and bootstrapping are also discussed for the estimation of multilevel models. However, these methods are not as widespread in multilevel studies and are not fully supported by the Stata software

information-maximum-likelihood (FIML) approach, whose likelihood function contains fixed regression parameters and the variances of the error terms, and (2) the restricted-maximum-likelihood (REML) approach, which only focuses on the variance components while neglecting the regression coefficients.⁴⁷⁶

In general, both methods should lead to identical estimators for the fixed effects. However, the REML approach accounts for the degrees of freedom from the mixed effects and, thus, results in estimates that are less biased. BRYK/RAUDENBUSH (1992) state that REML should theoretically produce more precise estimates when the number of groups on higher levels is low. On the other hand, an approximation of results from both methods can be expected with a growing number of observations.⁴⁷⁷ LANGER (2009), however, points out that, in research practice, these differences are almost negligible.⁴⁷⁸

For this study, the FIML approach has a vital advantage: The fact that the method accounts for fixed and random effects alike allow for comparing models with different fixed effect specifications with the help of likelihood-ratio tests. Consequently, FIML estimation is preferred for the purpose of this study.⁴⁷⁹

In addition to determining the model estimation method, an appropriate covariance structure should be specified in order to prevent biases. If the covariance structure is too simple, parameters might appear significant when, in reality, they are not (type I error). Accordingly, specifying a covariance structure that is too complex bears the risk of unjustifiably finding parameters to be non-significant (type II error).

The Stata 12.0 software package offers four possibilities to set the covariance structure: (1) Independent, with one unique variance parameter per random effect and all covariances set to zero so that random intercepts and slopes are uncorrelated. (2) Exchangeable, with one common variance for all random effects and one common pairwise covariance. (3) Identity, with equal variances for all random effects and all covariances set to zero. (4) Unstructured, allowing for all variances and covariances to be distinct.⁴⁸⁰

Because there was no real reason to believe that the random effects in this study are uncorrelated, the model was fit with the most flexible structure (unstructured).⁴⁸¹

3.3.4 Significance, Model Fit, and Explained Variance

The significance of model parameters was tested in two ways, namely at the parameter level, where simple Wald Tests were applied, and at the model level, where the change in

version (12.0) used in this work. For a more detailed discussion, see, for instance, Hox (2010), pp. 40-45 and FERRON et al. (2004), p. 18.

⁴⁷⁶ See LANGER (2009), pp. 102-104.

⁴⁷⁷ See BRYK/RAUDENBUSH (1992), p. 46.

⁴⁷⁸ See LANGER (2009), p. 103.

⁴⁷⁹ See SNIJDERS/BOSKER (2012), pp. 60-61 for a more in-depth discussion of both approaches to model estimation.

⁴⁸⁰ See STATA CORP LP (2013), pp. 297-298.

⁴⁸¹ At this point, it should be noted that no significant covariances of random effects were found with the help of Wald Tests in the later model development process. On the basis of likelihood-ratio tests, the models in each development step were also compared with identical models that apply the most simple covariance structure (independent), and the more complex structure option did not reach a significantly better model fit.

the overall model fit after adding a new parameter was examined on the basis of likelihood-ratio tests.

For the Wald Test, fixed and random effects as well as their standard errors were obtained from the FIML estimation. Their ratio $Z = (\text{estimate})/(\text{standard error of estimate})$ refers to the standard normal distribution. When testing the null hypothesis, which states that the variance of a random effect is zero, a one-sided test was conducted, since variances are non-negative by definition. For fixed effects, which can be both positive and negative, two-sided tests were used.⁴⁸² At this point, it should also be noted again that the sample size of this study might, at the city level, limit the overall precision of standard error estimations as discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden..**

The likelihood-ratio test is based on a comparison of two nested models, one with and one without a specific parameter under investigation based on their deviance⁴⁸³ as an indicator of how well the models fit the data.⁴⁸⁴ The difference between both models' deviances follows a chi-square distribution. The degrees of freedom are equal to the difference in the number of fixed parameters and variance components between the more complex and the simpler model.⁴⁸⁵ Commonly, the likelihood-ratio test is preferred over the Wald Test due to the stronger sample size dependency of the last mentioned and its lower accuracy when testing variances in the random part of a model.⁴⁸⁶ In this way, applying likelihood-ratio tests might also account for the limited sample size of this study at the city level.

The determination coefficient R^2 can be applied in order to examine the proportion of variance that is explained by a model and determines not only a relative, but also an absolute indicator, of a model's goodness of fit. In this regard, it must be taken into account that, in multilevel models, (1) unexplained variance components exist on all levels and (2) the concept of the explained proportion of variance has no clear definition in models with random regression coefficients.^{487/488}

Literature in the field of multilevel analysis mainly discusses two different perspectives on the proportion of explained variance: approaches referring to the total goodness of the fit of a model and approaches that focus on the explained variance on the different levels of a multilevel model.

The first one mentioned is based on a comparison of the likelihood between two models. A simple regression model without predictors and random intercepts or slopes, or a model

⁴⁸² See SNIJDERS/BOSKER (2012), pp. 94-99; HOX (2010), pp. 45-46; WALD (1943), pp. 427-429.

⁴⁸³ The deviance is defined as $-2 \times \ln(\text{likelihood})$.

⁴⁸⁴ See SNIJDERS/BOSKER (2012), pp. 97-98; HOX (2010), pp. 47-50; SIXT (2009), p. 193.

⁴⁸⁵ See LANGER (2009), p. 116.

⁴⁸⁶ See HOX (2009), p. 8. However, Hox (2010), p. 47 mentions that the Wald Test has an advantage over the likelihood-ratio test if the likelihood is determined with low precision. This might be the case when applying approaches to modeling non-normal data.

⁴⁸⁷ See LINTORF (2012), pp. 142-143, SNIJDERS/BOSKER (2012), pp. 109-110. A comprehensive discussion of the concept of explained variance in a multilevel context is also found in NAKAGAWA/SCHIELZETH (2013), pp. 133-134.

⁴⁸⁸ Some authors generally reject the concept of R^2 in multilevel analysis. KREFT/DE LEEUW (1998), p. 188, for instance, emphasize that the definition of R^2 in multilevel modeling is highly problematic. Especially since variance components on the different levels are partially confounded, the explanatory power of R^2 is substantially limited.

that only contains a random intercept are usually chosen as comparables. LANGER (2009) states that the calculated R^2 is smaller when the subject model is compared to a random intercept model, because the explanatory power of the random intercept is not taken into account.⁴⁸⁹ On the other hand, if a simple regression model is selected as a comparable, the R^2 also accounts for the proportion of variance that can be attributed to the random intercept but neglects the fact that this share, strictly speaking, is not explained by predictors.⁴⁹⁰ The McFadden Pseudo- R^2 and the Maddala Maximum-Likelihood-Ratio- R^2 (ML- R^2) are amongst the most discussed approaches.

MCFADDEN (1979) suggests the calculation of a Pseudo- R^2 that refers to the proportional reduction in error variance. For this reason, the log-likelihood of the model under investigation is divided by the log-likelihood of the comparable model. The author notes that “its values tend to be considerably lower than those of the R^2 index and should not be judged by the standards for a ‘good fit’ in ordinary regression analysis.”⁴⁹¹ In fact, values of 0.2 to 0.4 are considered an excellent model fit. This aspect is a main point of criticism, since the McFadden Pseudo- R^2 tends to produce unrealistically low values for the explained variance.⁴⁹²

The Maximum-Likelihood-Ratio- R^2 that was developed by MADDALA (1986) builds upon the likelihood of the models while also accounting for the sample size.⁴⁹³ Formula shows the corresponding calculation of the Maddala ML- R^2 according to the transformation suggested by LONG/FREESE (2003).⁴⁹⁴

Formula 2: Maddala Maximum-Likelihood-Ratio- R^2

$$\text{Maddala ML-}R^2 = 1 - \left[\frac{L(M_0)}{L(M_A)} \right]^{\frac{2}{n_{ij}}}$$

$$= 1 - \exp \left[\frac{-(-2 * \log L(M_0)) - (-2 * \log L(M_A))}{n_{ij}} \right]$$

$L(M_0)$ = likelihood of the null model
 $L(M_A)$ = likelihood of the more complex model
 $\log L(M_0)$ = log-likelihood of the null model
 $\log L(M_A)$ = log-likelihood of the more complex model
 n_{ij} = sample size

Source: MADDALA (1986), p. 39 cited in LANGER (2009), p. 120.

LANGER (2009) emphasizes that, in comparison to the McFadden Pseudo- R^2 , the Maddala ML- R^2 tends to overestimate the variance that is explained by a model. In fact, the calculation of ML- R^2 can result in values that even exceed the maximum variance that can be explained as determined by the ICC. However, in accordance with FRINGS (2010), LANGER (2009), HANS (2006), and PÖTSCHKE (2006), the Maddala ML- R^2 is preferred over the McFadden Pseudo- R^2 in this study, since it generally provides a more realistic picture of

⁴⁸⁹ See LANGER (2009), pp. 116-121.

⁴⁹⁰ See HANS (2006), p. 22.

⁴⁹¹ MCFADDEN (1979), p. 307.

⁴⁹² See LANGER (2010), pp. 756-757; LANGER (2009), p. 121.

⁴⁹³ See MADDALA (1986), p. 39.

⁴⁹⁴ See LONG/FREESE (2003), p. 92 cited in LANGER (2009), p. 121.

the variance explained.⁴⁹⁵ A random-intercept- only model and a simple model without predictors, random intercept, or slopes are chosen as reference models.

Regarding the explained variance on different levels, the two approaches developed by Bryk/Raudenbush and Snijders/Bosker are regularly discussed in multilevel analysis literature.

BRYK/RAUDENBUSH (1992) suggest a method relying on the proportional reduction in error variance. The model under investigation is compared to a reference model level by level, and the reduction in the level-specific variances is determined.⁴⁹⁶ Commonly, a random intercept only model that does not contain predictors and only attributes the total variance to the different levels, is chosen as a comparable. Formula depicts the corresponding calculation of R^2 on the first level of a multilevel model.

Formula 3: Bryk/Raudenbush- R^2 at the lowest level

$$\text{Bryk/Raudenbush Level 1 } R^2 = \frac{\hat{\sigma}_{e_{ij}}^2(M_0) - \hat{\sigma}_{e_{ij}}^2(M_1)}{\hat{\sigma}_{e_{ij}}^2(M_0)}$$

$\hat{\sigma}_{e_{ij}}^2(M_0)$ = lowest level residual variance for the baseline model M_0
 $\hat{\sigma}_{e_{ij}}^2(M_1)$ = lowest level residual variance for the comparison model M_1

Source: BRYK/RAUDENBUSH (1992), p. 74 cited in LANGER (2009), p. 149.

For variance components at higher levels, the calculation is analogous. The variance component of the null model or the fully specified lower level model can be used as a reference for determining the explained variance at higher levels.⁴⁹⁷ Consequently, in the latter case, R^2 refers to the difference in the variance that is explained by the higher level predictors and the variance that is already explained by the lower level predictors.⁴⁹⁸

BRYK/RAUDENBUSH's approach is mainly criticized for two reasons: (1) Variance components might become larger instead of smaller when predictors are added to the model. As a consequence, negative values for explained variances that are outside of the permissible value range of [0;1] are obtained and are not in accordance with the usually intuitive interpretation of R^2 .⁴⁹⁹ (2) In random slope models, the size of the estimated variances depends on the scale of the corresponding predictors. Therefore, changes in the predictor scales can lead to changes in the variance of the regression coefficients.⁵⁰⁰

⁴⁹⁵ See FRINGS (2010), p. 273; LANGER (2009), p. 120; HANS (2006), p. 22; PÖTSCHKE (2006), p. 174.

⁴⁹⁶ See BRYK/RAUDENBUSH (1992), pp. 68-70.

⁴⁹⁷ The authors also note that the proportion of explained variance on higher levels depends on the specification of fixed effects on lower levels. Thus, introducing lower level predictors might change variance components at higher levels. For this reason, interpreting R^2 for higher levels is only feasible when all lower level models have the same specification. Consequently, the authors recommend a bottom-up approach to model analysis, where the lower level models are developed before introducing higher-level parameters.

⁴⁹⁸ See HOX (2010), p. 71; BRYK/RAUDENBUSH (1992), p. 70.

⁴⁹⁹ See SNIJDERS/BOSKER (2012), p. 109; KREFT/DE LEEUW (1998), p. 118.

⁵⁰⁰ See HOX (2010), p. 73.

SNIJDERS/BOSKER (1994a, 1994b) developed an approach that builds upon the principle of proportional reduction of prediction error.⁵⁰¹ At the lowest level, the error term refers to the prediction of individual values, and the explained variance is defined as the proportional reduction in the mean squared prediction error. Under these circumstances, the mean squared prediction error relies on the difference between the observed values and their best linear predictors. On the second level, the error term refers to the prediction of group mean values. Thus, the explained proportion of variance is the proportional reduction in the mean squared prediction error for the cluster mean. Analogous to the first level, the mean squared prediction error at the second level is given by the sum of the mean variance component on Level 1 and the variance component on Level 2.⁵⁰² Commonly, a model that only excludes the predictors of interest is chosen as a reference point. Thereby, the explained variance of parameters on the second level is determined on the basis of a comparison with a fully specified Level 1 model that does not contain Level 2 predictors.

This approach is also subject to criticism. The authors did not achieve a full solution with respect to R^2 possibly becoming negative. In fact, SNIJDERS/BOSKER concede that in cases where samples are drawn from a population or where a model is misspecified, R^2 might be outside of the permissible value range [0;1]. Moreover, in random slope models, the calculations become highly complex. The authors themselves suggest approximating the calculation and relying on a random intercept model, since “this will normally yield values that are very close to the values for the random slopes model.”⁵⁰³

With this in mind and in accordance with LANGER’s (2009) suggestion, Bryk/Raudenbush’s R^2 was applied in this study for two reasons: (1) The variance explained by the random slope models, which are developed in this study, can be calculated directly without relying on approximations. (2) The Bryk/Raudenbush- R^2 allows for a separate examination of each random effect.⁵⁰⁴ This decision is also supported by the common use of this approach in studies from different fields of research.⁵⁰⁵ A random intercept only model was chosen as a reference for the calculation of R^2 .

3.3.5 Analysis Strategy

When no strict theory-driven model exists, which is the case in this study, HOX (2010), LANGER (2009), TABACHNICK/FIDELL (2007), and DITTON (1998) recommend a stepwise exploratory approach to a multilevel model analysis.⁵⁰⁶ Generally, a simple model that only

⁵⁰¹ See SNIJDERS/BOSKER (1994a), pp. 350-354; SNIJDERS/BOSKER (1994b), p. 15. Also see SNIJDERS/BOSKER (2012), pp. 109-114, and HOX (2010), pp. 69-78 for a more comprehensive discussion of this approach.

⁵⁰² The mean usually refers to the number of level 1 units per group. If the groups on level 2 vary in their size, the harmonic group mean is applied.

⁵⁰³ SNIJDERS/BOSKER (2012), p. 114. An exemplary application of this approach is found, for example, in LINTORF (2012), p. 145.

⁵⁰⁴ See LANGER (2009), pp. 151-152.

⁵⁰⁵ See, for example, ROOSE (2008), pp. 321-341 for an application in a sociological area, and GRÖHLICH (2012), p. 126 for an application in the field of education.

⁵⁰⁶ See HOX (2010), pp. 54-59; LANGER (2009), pp. 190-191; TABACHNICK/FIDELL (2007), pp. 834-835; DITTON (1998), 60-68.

contains the dependent variable is estimated in an initial step. From there, fixed and random effects are successively added.⁵⁰⁷

The analysis applied in this study mainly refers to Hox' (2010) detailed outline for an explorative analysis strategy and adds an independent group *t*-test as well as a simple regression analysis based on the pooled dataset prior to the multilevel analysis. In each step of the model development, new parameters are introduced and examined on the basis of Wald Tests, likelihood-ratio tests, and changes in Maddala's $ML-R^2$, Bryk/Raudenbush's R^2 , and the ICC.

Step 1: In the first step, a random intercept-only model is estimated that is only comprised of the dependent variable, but no predictors. Consequently, the model only contains the constant and its variance components at the different levels. With the help of this model, the total variance is split between the different levels and the ICC is calculated. Moreover, it is commonly used as a benchmark for the model fit and the calculation of the explained variance. Formula shows the corresponding model equation.

The intercept-only model explains the observed market value y at measurement occasion i of a property j in a postcode area k in a city l on the basis of the intercept β_{0000} (grand mean of the pooled dataset), the city-specific deviation from the grand mean f_l , the postcode-specific deviation from the city mean v_{kl} , the property-specific deviation from the postcode area mean u_{jkl} , and the residual e_{ijkl} .

Formula 4: Random Intercept-Only Model

$y_{ijkl} = \beta_{0000} + f_l + v_{kl} + u_{jkl} + e_{ijkl}$	
$f_l \sim N(0, \sigma_f^2)$	y_{ijkl} = Observed market value score for measurement occasion i in property j in postcode area k in city l
$v_{kl} \sim N(0, \sigma_v^2)$	β_{0000} = Grand mean in market value (intercept)
$u_{jkl} \sim N(0, \sigma_u^2)$	f_l = Deviation of city mean from grand mean (random intercept)
$e_{ijkl} \sim N(0, \sigma_e^2)$	v_{kl} = Deviation of postcode area mean from city mean (random intercept)
	u_{jkl} = Deviation of property mean from postcode area mean (random intercept)
	e_{ijkl} = Deviation of measurement occasion from property mean (residual error term)

Source: Own representation based on RABE-HESKETH/SKRONDAL (2012), p. 77; HOX (2010), p. 56.

Step 2: In the second step, the explanatory variables on the first level ('Year', 'Rent', and 'Building Age') are introduced to the model as fixed effects. As a consequence, it is assumed that their relationship with the outcome variable does not vary across contexts. All independent variables are checked for their individual significance, and all separately significant predictors are included in a joint model afterwards. AITKIN/ZUZOVSKY (1994) suggests that insignificant predictors be successively eliminated on this basis, starting with

⁵⁰⁷ TABACHNICK/FIDELL (2007) mention an alternative top-down-approach that starts with the most complex model and successively eliminates parameters. However, GLOGER (2007), p. 223 notes that, in practice, this analysis strategy often leads to convergence problems. The approach was also tested for this study, but model convergence was not achieved.

the highest regression coefficient.⁵⁰⁸ Formula depicts the general equation for the random intercept model with first level predictors in this study.

Formula 5: Random Intercept Model with First Level Predictors

$$y_{ijkl} = \beta_{0000} + \beta_{p000}X_{pijkl} + f_l + v_{kl} + u_{jkl} + e_{ijkl}$$

β_{p000} = Regression slope of 1st-level variable p (fixed effect)
 X_{pijkl} = Parameter value variable p for measurement occasion i within property j within postcode area k within city l

Source: Own representation based on RABE-HESKETH/SKRONDAL (2012), p. 127; HOX (2010), p. 56.

Step 3: The third step successively integrates all higher-level explanatory variables into the random intercept model. For this study, ‘Brand Status’ and ‘Usable Area’ are introduced at the property level and the ‘City Size’ is added on city level. The intercept may vary again across groups while the regression coefficients remain fixed. Formula shows the corresponding model equation.

Step 4: This model is extended to a random intercept and random coefficient model that accounts for context-specific variations in the regression coefficients of the predictors. The outcome variable is explained by the regression coefficients and both their constant as well as their variance components at the various levels. Formula provides the equation for the random intercept random coefficient model in this study.

Formula 6: Random Intercept Model with First- and Higher-Level Predictors

$$y_{ijkl} = \beta_{0000} + \beta_{p000}X_{pijkl} + \beta_{0q00}X_{qjkl} + \beta_{000r}X_{rl} + f_l + v_{kl} + u_{jkl} + e_{ijkl}$$

β_{0q00} = Regression slope of 2nd-level variable q (fixed effect)
 β_{000r} = Regression slope of 4th-level variable r (fixed effect)
 X_{qjkl} = Parameter value of variable q for property j within postcode area k within city l
 X_{rl} = Parameter value of variable r for city l

Source: Own representation based on RABE-HESKETH/SKRONDAL (2012), p. 127; HOX (2010), p. 57.

In line with the procedure for the fixed effects, a separate significance check is carried out for all random coefficients, and all individually significant random coefficients are included in a joint model. From there, non-significant parameters are excluded from the model, applying AITKIN/ZUZOVSKY’s backward elimination. HOX (2010) points out that insignificant fixed effects that were eliminated in prior steps should be reassessed, since they might yield a significant variance in their regression coefficients.⁵⁰⁹

Formula 7: Random-Intercept/Random-Coefficient Model

⁵⁰⁸ See AITKIN/ZUZOVSKY (1994), p. 52. This backward elimination method is also applied by GRÖHLICH (2012), p. 125.

⁵⁰⁹ See HOX (2010), p. 58.

$$y_{ijkl} = \beta_{0000} + \beta_{p000}X_{pijkl} + \beta_{0q00}X_{qjkl} + \beta_{000r}X_{rl} \\ + f_{0l} + f_{pl}X_{pijkl} + f_{ql}X_{qjkl} \\ + v_{kl} + u_{jkl} + e_{ijkl}$$

f_{0l} = Deviation of city l mean from grand mean (random intercept)
 f_{pl} = city-specific random slope for the 1st-level explanatory variable X_{pijkl} (random coefficient)
 f_{ql} = city-specific random slope for the 2nd-level explanatory variable X_{qijkl} (random coefficient)

Source: Own representation based on RABE-HESKETH/SKRONDAL (2012), p. 188; HOX (2010), p. 58.

Looking at potential random effects, variances between different cities seem most informative from a real estate perspective. Cities are commonly used as units to define regional markets and, thus, are important points of reference in the real estate industry. For instance, real estate practitioners rely on city-specific portfolio decisions. In the same way, the selection of a certain city is a vital decision for private and commercial tenants alike, and in real estate research, cities are commonly referred to as spatial units of investigation and context for a variety of studies.⁵¹⁰ On the other hand, random effects on postcode areas or property levels might lead to granular results whose applicability in real estate practice seems doubtful. In addition, the study does not consider predictors on postcode area level that may contribute to explaining variances between contexts. Equally, the anonymization of the dataset limits the possibilities of a more detailed property-specific examination, which is necessary to derive meaningful results for real estate practitioners. Moreover, an increasing number of random effects might lead to convergence problems in the model development. Against this background, this study focuses on random effects at the city level only.

Step 5: In a last step, interaction effects are integrated in the random intercept random slope model as the product of the respective variables. At this point, direct effects that were eliminated for being insignificant in prior steps are taken into account as well, since they might yield significant interaction effects with other variables. In the course of a multi-level analysis, interaction effects between variables on the same level as well as cross-level interactions can be examined. Cross-level interactions between explanatory higher-level and lower-level variables with a significant slope variance are commonly in the focus of interest.⁵¹¹

In this study, the main emphasis is drawn to the independent variable ‘Brand Status’, its relationship with the outcome variable, and the relationship’s potential dependencies regarding the set of covariates. Consequently, only interactions between ‘Brand Status’ and the other predictors are included in the model.

Formula depicts the random-intercept random-coefficient model with interaction effects. Additionally, Formula provides the model equation with variable names for a clearer picture of the full multilevel model.

⁵¹⁰ See SCHULTE/HOLZMANN (2005), p. 40; Väh/Hoberg (2005), p. 361; ERTLE-STRAUB (2002), pp. 25-29.

⁵¹¹ See Hox (2010), p. 58.

Formula 8: Random-Intercept/Random-Coefficient Model with Interaction Effects

$$\begin{aligned}
y_{ijkl} = & \beta_{0000} + \beta_{p000}X_{pijkl} + \beta_{0q00}X_{qjkl} + \beta_{000r}X_{rl} \\
& + \beta_{pq00}X_{pijkl}X_{qjkl} + \beta_{0q0r}X_{qjkl}X_{rl} \\
& + f_{0l} + f_{pl}X_{pijkl} + f_{ql}X_{qjkl} \\
& + v_{kl} + u_{jkl} + e_{ijkl}
\end{aligned}$$

β_{pq00} = Slope of the interaction effect between 1st-level variable X_{pijkl} and 2nd-level variable X_{qjkl}
 β_{0q0r} = Slope of the interaction effect between 2nd-level variable X_{qjkl} and 4th-level variable X_{rl}

Source: Own representation based on RABE-HESKETH/SKRONDAL (2012), p. 211; HOX (2010), p. 58.

Formula 9: Full Model with Variable Names

1st-level fixed effects	$ \begin{aligned} y_{ijkl} = & \beta_0 + \beta_1(Year)_{ijkl} + \beta_2(Rent)_{ijkl} + \beta_3(Building\ Age)_{ijkl} \\ & + \beta_4(Brand\ Status)_{jkl} + \beta_5(Usable\ Area)_{jkl} \\ & + \beta_6(City\ Size)_l \\ & + \beta_7(Year)_{ijkl}(Brand\ Status)_{jkl} + \beta_8(Rent)_{ijkl}(Brand\ Status)_{jkl} + \beta_9(Building\ Age)_{ijkl}(Brand\ Status)_{jkl} \\ & + \beta_{10}(Usable\ Area)_{jkl}(Brand\ Status)_{jkl} \\ & + \beta_{11}(City\ Size)_l(Brand\ Status)_{jkl} \\ & + f_{0l} + f_{1l}(Year)_{ijkl} + f_{2l}(Rent)_{ijkl} + f_{3l}(Building\ Age)_{ijkl} + f_{4l}(Brand\ Status)_{jkl} + f_{5l}(Usable\ Area)_{jkl} \\ & + v_{kl} + u_{jkl} + e_{ijkl} \end{aligned} $
2nd-level fixed effects	
4th-level fixed effects	
1st/2nd-level interaction effects	
2nd/2nd-level interaction effects	
2nd/4th-level interaction effects	
4th-level random slopes/intercept	
2nd- & 3rd-level random intercept and 1st-level residuals	

Source: Own representation based on HOX (2010), p. 14.

3.4 Study Results

In the first section, this chapter briefly summarizes the results of a preparatory *t*-test and multivariate regression based on the pooled dataset. Afterwards, the results of the multi-level analysis are outlined in detail-based on the five steps described in Section **Fehler! Verweisquelle konnte nicht gefunden werden.** The final model is examined in a post-estimation residual analysis that focuses on the assumptions of normality and homoscedasticity. Finally, the main findings of the analysis are summarized, conclusions for real estate practitioners are drawn, and the limitations of the study are highlighted.

3.4.1 T-Test and Regression with Pooled Data Set

Prior to the multilevel analysis, the dataset was checked for differences between observations from branded and non-branded properties regarding the outcome variable. Following the suggestion made by RABE-HESKETH/SKRONDAL (2012), a simple independent group *t*-test with unequal variances was carried out for this purpose.⁵¹² The test was based on the pooled dataset, therefore neglecting its hierarchical structure. Consequently, all limitations of single-level analyses outlined in Section **Fehler! Verweisquelle konnte nicht gefunden werden.** apply. Table provides an overview of the test results.

⁵¹² See RABE-HESKETH/SKRONDAL (2012), pp. 12-17.

Table 9: Independent Group T-Test Results

Group	Observations	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
non-branded	3713	7.710349	0.0071924	0.4382645	7.696247	7.72445
branded	520	8.04439	0.0175853	0.4010072	8.009843	8.078937
combined	4233	7.751384	0.0068775	0.4474618	7.7379	7.764867
difference		-0.3340412	0.0189993		-0.3713432	-0.2967391

difference = mean(non-branded) - mean(branded) t = -17.5817

H₀: difference = 0 Satterthwaite's degrees of freedom = 704.405

H _a : difference < 0	H _a : diff ≠ 0	H _a : difference > 0
Pr(T<t)=0.000	Pr(T > t)=0.000	Pr(T>t)=1.000

Source: Own illustration.

For non-branded observations, an arithmetic mean score for 'Logvalue' of app. 7.710 was calculated, equaling a geometric mean of app. $(\exp(7.710)-1) \times 100 =$ app. 2,230.54 EUR/m² for the original variable 'Value' after back-transformation of the natural logarithm. Similarly, mean scores for branded observations (app. 8.044; app. 3,155.05 EUR/m²) and the total dataset (app. 7.751; app. 2,347.25 EUR/m²) were determined. The *t*-statistic was -17.5817 with 704.405 degrees of freedom. The corresponding two-tailed *p*-value was < 0.001, indicating that the difference of means in 'Logvalue' between branded and non-branded observations is different from 0. The one-tailed *p*-values showed that the difference is significantly lower than 0 ($p < 0.001$), leading to the conclusion that the mean 'Logvalue' of branded observations is significantly higher than the mean 'Logvalue' of non-branded observations.

Before the multilevel analysis, a multivariate linear regression was also conducted, including all predictors and interaction effects. This way, the relationships between the independent variables and the outcome variable were initially examined on the basis of the pooled dataset. Table provides an overview of the regression results.

Table 10: Regression Results

Number of obs =	4233	R-squared =	0.6988
F(11 ,4221) =	890.38	Adj. R-squared =	0.6980
df model =	11	Root MSE=	0.24588
df residual =	4221		
Prob > F =	0.000		

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Year	-0.0079415	0.0020287	-3.91	0.000	-0.0119189	-0.0039642
Rent	0.0048946	0.000062	78.89	0.000	0.004773	0.0050162
Building Age	-0.0019706	0.0002189	-9	0.000	-0.0023998	-0.0015414
Brand Status	0.1339415	0.0188976	7.09	0.000	0.0968923	0.1709907
Usable Area	0.0203569	0.0038241	5.32	0.000	0.0128597	0.0278541
City Size	0.098887	0.0053686	18.42	0.000	0.0883617	0.1094123
Brand Status*Year	0.0071211	0.005842	1.22	0.223	-0.0043322	0.0185745
Brand Status*Rent	-0.0010304	0.0001466	-7.03	0.000	-0.0013178	-0.0007429
Brand Status*Building Age	-0.0017931	0.0009194	-1.95	0.051	-0.0035955	0.00000939
Brand status*Usable Area	-0.0391478	0.0106947	-3.66	0.000	-0.0601151	-0.0181806
Brand Status*City Size	-0.034143	0.015097	-2.26	0.024	-0.0637409	-0.004545
Constant	7.716554	0.0042041	1835.49	0.000	7.708312	7.724796

Source: Own illustration.

All direct relationships between the explanatory variables and 'Logvalue' are significant with $p < 0.001$. The outcome variable has a mean score of app. 7.717, equaling a geometric mean of 'Value' of app. 2,246.21 EUR/m² for a non-branded observation with mean parameter values for all other predictors. For a one unit increase in 'Year' of Observation, a decrease of app. 0.8% in the geometric mean of 'Value' is expected. Analogically, an increase in Building Age by 1 leads to a decrease by app. 0.2%. The other explanatory variables have positive regression coefficients: A one unit increase in Rent, 'Usable Area', and 'City Size' is associated with an increase in 'Value' by app. 0.5%, 2.0%, and 10.4%.

A significant ($p < 0.001$) positive relationship was also found for 'Brand Status'. In case of observations from branded properties, the conditional geometric mean of 'Value' is expected to be app. 14.3% higher than for observations from non-branded properties when all interacting variables are kept at zero. Significant interaction effects were detected between 'Brand Status' and 'Rent' ($p < 0.001$), 'Usable Area' ($p < 0.001$) and 'City Size' ($p < 0.05$). Thus, the relationship between 'Brand Status' and the value of a property is expected to be moderated by these covariates. A one unit increase in these variables is associated with a decrease in this relationship by 0.001 (Rent), 0.039 ('Usable Area') and 0.034 ('City Size') units. By extension, a weaker relationship between 'Brand Status' and 'Logvalue' is expected for observations from older and larger properties as well as properties with a higher rental level.

Altogether, the t -test and the regression analysis indicated significant differences between observations of branded and non-branded properties regarding the property value. The multiple linear regression showed that a positive relationship can be expected between the variable 'Brand Status' and the outcome variable. Moreover, significant interaction effects were found between 'Brand Status' and three covariates. However, both analyses were based on the pooled dataset, thus neglecting its hierarchy. Consequently, the results do not reflect the nested structure of measurement occasions, properties, postcode areas,

and cities and might underlie respective biases. In the following section, the hierarchical data structure is taken into account in the course of the multilevel analysis.

3.4.2 Random Intercept-Only Model

In a first step, the four-level-model was estimated as a random intercept-only model that only contains the independent variable 'Logvalue' and its variance components at different levels. Additionally, a simple single-level model was estimated as a comparison. The estimation results for both models are summarized in Table .

In Model 1, the intercept was estimated with 7.495 ($p < 0.001$) across all observations, equalling a geometric mean of value of app. $\exp(7.495) = 1,799.02$ EUR/m² after log back-transformation. When the data structure is neglected, 7.751 (app. 2,321.90 EUR/m²; $p < 0.001$) is estimated as a mean score for 'Logvalue' in Model 0.

Table 11: Random Intercept-Only Model and Pooled Data Model

		Model 0	Model 1
		Pooled data model	Random intercept-only model
Fixed Part	Constant	7.751384*** [2,324.79] {1,127.19}	7.494638*** [1,798.37] {131.84}
	City level		
Random Part	Variance (intercept)		.0515513 (.0192538)
	Postcode area level		
	Variance (intercept)		.0448127 (.0073223)
	Property level		
	Variance (intercept)		.1092228 (.0052597)
	Variance (first-level residuals)	.2001747 (.0043511)	.0048932 (.0001241)
	Total variance (intercept)	0.2001747	0.2104417
	Log-likelihood	-2,601.84	2,745.57
	Deviance	5,203.68	-5,491.13
	Intraclass Correlation Coefficient		
	City level	-	0.2449
	Postcode area level	-	0.2129
	Property level	-	0.5189
	N	4,233	4,233
*** $P > z = 0.001$		{...} = z-score	
** $P > z = 0.01$		[...] = log back transformation	
* $P > z = 0.05$		(....) = standard error	

Source: Own illustration.

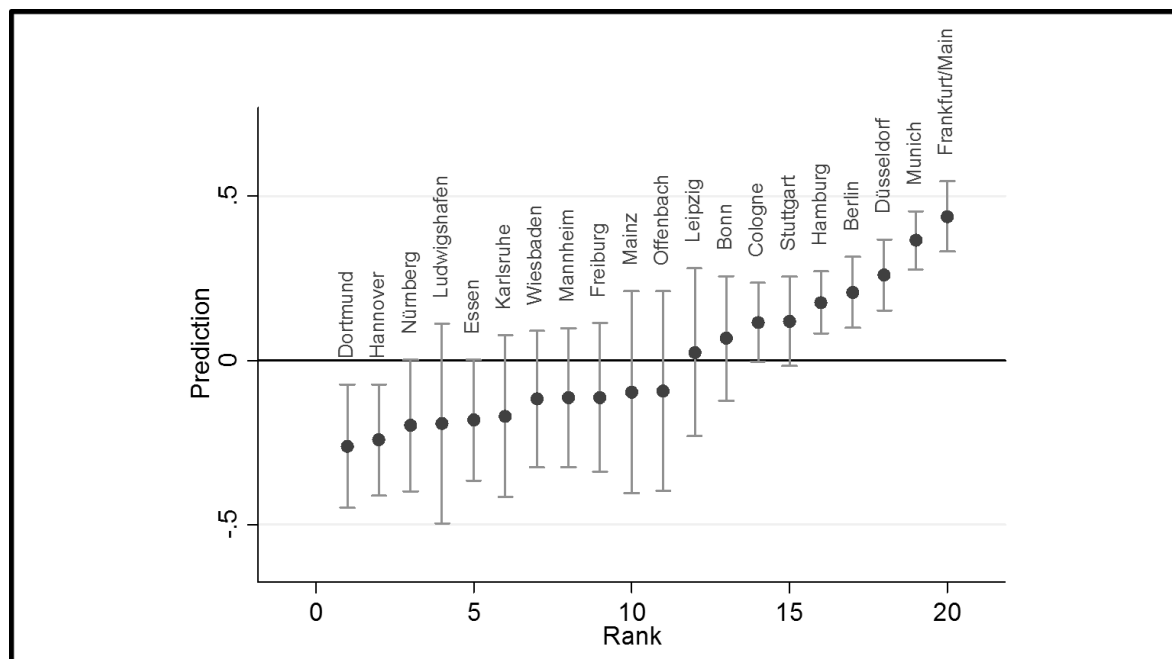
Considering the random part of Model 1, the intercept variance at the city level is estimated with 0.052, at the postcode area level with 0.049, and at the property level with 0.109. On measurement occasion level, the variance is only 0.005. Correspondingly, the ICCs reflect a substantial share of variance on the higher levels. At the city level, the ICC is calculated with 0.2449, 0.2129 on postcode area level, and 0.5189 on property level. Obviously, a major part of the independent variable's total variance can be attributed to higher

levels and only app. 2.3% results from variation between measurement occasions. The property level clearly shows the highest relative importance as a source of variation between observations.

The suggested four-level model was tested against a simple single-level linear regression with the help of a likelihood-ratio test. The test was significant ($p < 0.001$), indicating that the model provides a better fit to the dataset, and the total variance on higher levels is significantly different from zero. In the same way, the model was also compared with all the other possible hierarchical structures comprised of only three or two higher levels. All likelihood-ratio tests were significant ($p < 0.001$), emphasizing that each of the four levels contributes to an improvement of the model fit and should be included in the model.

Figure additionally visualizes which cities are significantly different from the grand mean intercept. The caterpillar plot ranks the different cities according to their predicted random-intercepts and approximate 95% confidence intervals. Obviously, the mean intercepts of Dortmund and Hannover are significantly lower than the grand mean while the mean intercepts of Hamburg, Berlin, Düsseldorf, Munich, and Frankfurt/Main are significantly higher than the grand mean. Apparently, properties' market value is more homogeneous within cities than across the total market.⁵¹³

Figure 16: Caterpillar Plot of Random Intercept Predictions and Approximate 95% Confidence Intervals versus Ranking



Source: Own illustration.

Altogether, and in light of this, it becomes clear that disregarding the multilevel structure of the dataset might bear the risk of a substantial inflation of the Type I error rate. Therefore, the necessity of a multilevel analysis is apparent for this study.⁵¹⁴

⁵¹³ See RABE-HESKETH/SKRONDAL (2012), pp. 208-209; HAASE (2011), pp. 130-131.

⁵¹⁴ See TABACHNICK/FIDELL (2007), p. 789.

3.4.3 Random Intercept / Fixed Coefficient Model

All first-level explanatory variables are successively added to the model as fixed effects before all higher-level predictors are introduced step-by-step. Individually significant effects are retained and re-estimated together in one model on a level by level basis. For reasons of focus, only the joint Models 5, 8, and 9 are discussed in more depth.

First level explanatory variables: 'Year', 'Rent' and 'Building Age' were separately included in Models 2, 3, and 4. Model 5 comprises a combination of the three predictors. Table on the following page provides an overview of the estimation results.

All explanatory variables at the measurement occasion level showed a significant ($p < 0.001$) relationship with 'Logvalue'. Likelihood-ratio tests comparing Models 2, 3, and 4 with Model 1 were also significant ($p < 0.001$), indicating an individual contribution of 'Year', 'Rent' and 'Building Age' to the model fit.

The three explanatory variables also remain significant ($p < 0.001$) in Model 5. For a one unit increase in 'Year', a decrease in 'Logvalue' by 0.006 is expected, holding all other predictors constant. This equals a percentage reduction in the geometric mean of 'Value' by app. 0.63%. Similarly, a negative relationship was estimated for 'Building Age' (-0.005; -0.54%) and a positive relationship for 'Rent' (0.001; 0.11%).

The total unexplained variance of 'Logvalue' was reduced from 0.210 to 0.151 when compared to Model 1. In line with this result, the Maddala ML- R^2 indicates an explained variance of 21.5%. According to the Bryk/Raudenbush R^2 , the three predictors contribute to the explained variance at all levels: the explained variance amounts to 29.3% at the city level, 13.4% at the post code area level, 34.0% at the property level, and 17.6% at the measurement occasion level.⁵¹⁵ Moreover, all likelihood-ratio tests comparing Model 5 with model variations that only comprise one or two of the three predictors were significant ($p < 0.001$).

Looking at the results of the model estimation, the effects of Year, 'Rent' and Building Age are separately and jointly significant and contribute to the overall model fit, explaining a substantial part of the variation in 'Logvalue'. For this reason, the three first-level predictors are kept for the further model development.

Second level explanatory variables: On property level, 'Brand Status' and 'Usable Area' were added separately as new explanatory variables in Model 6 and 7 and examined together in Model 8. The corresponding estimation results are found in In all three models, a significant ($p < 0.001$) positive relationship with the outcome variable was found for the two predictors. Likelihood-ratio tests were applied, comparing Models 6 and 7 with Model 5 as well as Model 8 with Models 6 and 7. All tests were significant ($p < 0.001$), suggesting that both variables together promise the largest improvement of the model fit.

⁵¹⁵ Lower level variables can explain variance at higher levels: If the distribution of the explanatory variables is not exactly the same in all higher level groups, the groups do differ in their composition, and this variation can explain some of the higher level variance. In this study, 'Year', 'Building Age', and 'Rent' seem to be distributed quite equally across postcode areas, but not so much across cities and properties. See Hox (2010), p. 71.

In Model 8, an increase in 'Brand Status' by one unit is associated with an increase in 'Logvalue' by app. 0.160 units, representing a 17.36% change in the geometric mean of the untransformed outcome variable. Likewise, a one unit increase in 'Usable Area' goes together with a app. 0.027 unit increase in 'Logvalue' (app. 2.73%).

The unexplained variance of 'Logvalue' was further reduced from 0.151 to 0.144 in comparison to Model 5, and Maddala ML- R^2 indicates an explained variance of 22.6%. Regarding the partitioning of explained variance, Bryk/Raudenbush R^2 implies that 'Brand Status' and 'Usable Area' contribute to the variance explanation on property (39.4%) and city level (34.5%). However, a reduction in explained variance was calculated for the postcode area level (10.6%) and the measurement occasion level (17.1%).

On a balance, 'Brand Status' and 'Usable Area' were found to have significant relationships with the outcome variable and yield a substantial contribution to the model fit. Thus, both explanatory variables are retained in the further model development.

Fourth level explanatory variables: The explanatory variable 'City Size' was added on the fourth level in Model 9. **Fehler! Ungültiger Eigenverweis auf Textmarke.** provides a summary of the model estimation.

A significant ($p < 0.01$) positive relationship between 'City Size' and 'Logvalue' was detected, indicating that a one unit increase in the predictor corresponds with a 0.127 unit increase in the conditional mean of the outcome variable. In terms of the untransformed dependent variable, a change in the geometric mean by app. 13.5% can be expected.

In comparison to the model that only contains first- and second-level predictors the unexplained variance of 'Logvalue' was further diminished from 0.144 to 0.130. Looking at the Maddala ML- R^2 , the explained variance of the model has improved by 22.7% in comparison to Model 1. The explanatory power of the new predictor 'City Size' focuses on the fourth level where the Bryk/Raudenbush R^2 implies a proportion of explained variance of 60.2%. A slight increase in explained variance from app. 10.6% in Model 8 to app. 11.3% was also calculated for the postcode area level. On property and measurement occasion level, Bryk/Raudenbush R^2 did not change substantially.

Considering its significant relationship with the outcome variable and the apparent contribution to variance explanation, the explanatory variable 'City Size' is kept in the model.

The step-wise development of the random intercept model proved all explanatory variables to be individually and jointly significant. For this reason, Model 9 is used as a basis for the subsequent analysis of variances in the regression coefficients.

Table on Page 118.

Table 12: Random Intercept Model with First-Level Effects

	Model 2	Model 3	Model 4	Model 5
Fixed Part				
City level				
City Size				
Postcode area level				
-				
Property level				
Brand Status				
Usable Area				
Measurement occasion level				
Year	-0.0113476*** [-1.14%] {-17.13}			-0.0062494*** [-0.63%] {-8.05}
Building Age		-0.0083841*** [-0.84%] {-19.61}		-0.0054255*** [-0.54%] {-11.47}
Rent			.0011334*** [0.11%] {25.49}	.0011051*** [0.11%] {26.17}
Constant	7.486642*** [1,784.05] {130.65}	7.45702*** [1,731.98] {138.71}	7.522538*** [1,849.25] {150.61}	7.49248*** [1,794.50] {155.36}
Random Part				
City level				
Variance (intercept)	.0523713 (.0195281)	.0443838 (.0169688)	.0399711 (.0149478)	.0364383 (.0137769)
Postcode area level				
Variance (intercept)	.0456818 (.0074351)	.0530306 (.0076265)	.0341556 (.0056853)	.0388035 (.0058055)
Property level				
Variance (intercept)	.1108705 (.0053289)	.0970169 (.0046994)	.0810491 (.0040665)	.0721385 (.0036025)
Variance (first-level residuals)	.0044518 (.0001129)	.0044844 (.0001141)	.0044998 (.0001157)	.0040326 (.0001035)
Total variance (intercept)	0.213375	0.198916	0.159676	0.151413
Log-likelihood	2,885.07	2,928.17	3,038.71	3,257.71
Deviance	-5,770.15	-5,856.34	-6,077.42	-6,515.42
Maddala ML-R²				
Compared to model 0	0.9252	0.9267	0.9304	0.9372
Compared to model 1	0.0638	0.0827	0.1293	0.2149
Intraclass Correlation Coefficient				
City level	0.2454	0.2231	0.2503	0.2407
Postcode area level	0.4595	0.4897	0.4642	0.4969
Property level	0.9791	0.9775	0.9718	0.9734
Bryk/Raudenbush-R² (compared to model 1)				
City level (constant)	-0.0159	0.1390	0.2246	0.2932
Postcode area level (constant)	-0.0194	-0.1834	0.2378	0.1341
Property level (constant)	-0.0151	0.1118	0.2579	0.3395
Measurement occasion level (residual)	0.0902	0.0835	0.0804	0.1759
N	4,233	4,233	4,233	4,233
*** P> z = 0.001 {...} = z-score				
** P> z = 0.01 [...] = log back transformation				
* P> z = 0.05 (...) = standard error				

Source: Own illustration.

In all three models, a significant ($p < 0.001$) positive relationship with the outcome variable was found for the two predictors. Likelihood-ratio tests were applied, comparing Models 6 and 7 with Model 5 as well as Model 8 with Models 6 and 7. All tests were significant ($p < 0.001$), suggesting that both variables together promise the largest improvement of the model fit.

In Model 8, an increase in 'Brand Status' by one unit is associated with an increase in 'Logvalue' by app. 0.160 units, representing a 17.36% change in the geometric mean of the untransformed outcome variable. Likewise, a one unit increase in 'Usable Area' goes together with a app. 0.027 unit increase in 'Logvalue' (app. 2.73%).

The unexplained variance of 'Logvalue' was further reduced from 0.151 to 0.144 in comparison to Model 5, and Maddala ML- R^2 indicates an explained variance of 22.6%. Regarding the partitioning of explained variance, Bryk/Raudenbush R^2 implies that 'Brand Status' and 'Usable Area' contribute to the variance explanation on property (39.4%) and city level (34.5%). However, a reduction in explained variance was calculated for the postcode area level (10.6%) and the measurement occasion level (17.1%).⁵¹⁶

On a balance, 'Brand Status' and 'Usable Area' were found to have significant relationships with the outcome variable and yield a substantial contribution to the model fit. Thus, both explanatory variables are retained in the further model development.

Fourth level explanatory variables: The explanatory variable 'City Size' was added on the fourth level in Model 9. **Fehler! Ungültiger Eigenverweis auf Textmarke.** provides a summary of the model estimation.

A significant ($p < 0.01$) positive relationship between 'City Size' and 'Logvalue' was detected, indicating that a one unit increase in the predictor corresponds with a 0.127 unit increase in the conditional mean of the outcome variable. In terms of the untransformed dependent variable, a change in the geometric mean by app. 13.5% can be expected.

In comparison to the model that only contains first- and second-level predictors the unexplained variance of 'Logvalue' was further diminished from 0.144 to 0.130. Looking at the Maddala ML- R^2 , the explained variance of the model has improved by 22.7% in comparison to Model 1. The explanatory power of the new predictor 'City Size' focuses on the fourth level where the Bryk/Raudenbush R^2 implies a proportion of explained variance of 60.2%. A slight increase in explained variance from app. 10.6% in Model 8 to app. 11.3% was also calculated for the postcode area level. On property and measurement occasion level, Bryk/Raudenbush R^2 did not change substantially.

Considering its significant relationship with the outcome variable and the apparent contribution to variance explanation, the explanatory variable 'City Size' is kept in the model.

The step-wise development of the random intercept model proved all explanatory variables to be individually and jointly significant. For this reason, Model 9 is used as a basis for the subsequent analysis of variances in the regression coefficients.

⁵¹⁶ The disadvantage of Bryk/Raudenbush's R^2 to result in a decreasing or even negative R^2 when new predictors are added to a model was discussed in section **Fehler! Verweisquelle konnte nicht gefunden werden..** See SNIJDERS/BOSKER (2012), pp. 109-111; LANGER (2009), pp. 151-152.

Table 13: Random-Intercept Model with First-, Second-, and Fourth-Level effects

	Model 6	Model 7	Model 8	Model 9
City level				
City Size				.1266393** [13.50%] (3.19)
Postcode area level				
-				
Property level				
Brand Status	.1818563*** [24.78%] (6.73)		.1600562*** [17.36%] (5.90)	.161252*** [17.50%] (5.95)
Usable Area		.0350383*** [3.57%] (5.05)	.0269346*** [2.73%] (3.84)	.0266294*** [2.70%] (3.79)
Measurement occasion level				
Year	-.0067443*** [-0.63%] (-8.71)	-.0066377*** [-0.67%] (-8.56)	-.0069805*** [-0.70%] (-9.02)	-.0069986*** [-0.70%] (-9.05)
Building Age	-.0049105*** [-0.53%] (-10.46)	-.0050449*** [-0.51%] (-10.80)	-.0046819*** [-0.47%] (-10.06)	-.0046596*** [-0.47%] (-10.01)
Rent	.0011036*** [0.11%] (26.16)	.0011135*** [0.11%] (26.32)	.0011097*** [0.11%] (26.27)	.0011103*** [0.11%] (26.29)
Constant	7.473989*** [1,756.71] (156.21)	7.493952*** [1,797.14] (160.16)	7.477408*** [1,767.65] (159.84)	7.556306*** [1,909.74] (171.39)
City level				
Variance (intercept)	.0358477 (.0135723)	.0336865 (.0129396)	.0337661 (.0129456)	.0204954 (.0084706)
Postcode area level				
Variance (intercept)	.0379245 (.0057147)	.0413841 (.0059742)	.0400651 (.0058716)	.0397621 (.0058277)
Property level				
Variance (intercept)	.0690641 (.0034611)	.0677145 (.0034558)	.0661408 (.0033759)	.0661522 (.0033769)
Variance (first-level residuals)	.0040325 (.0001035)	.0040677 (.0001048)	.0040576 (.0001045)	.0040575 (.0001045)
Total variance	0.146869	0.146853	0.144030	0.130467
Log-likelihood	3,279.92	3,269.58	3,286.85	3,291.04
Deviance	-6,559.84	-6,539.16	-6,573.69	-6,582.07
Maddala ML-R²				
Compared to model 0	0.9379	0.9376	0.9381	0.9382
Compared to model 1	0.2231	0.2193	0.2257	0.2272
Intraclass Correlation Coefficient				
City level	0.2441	0.2294	0.2344	0.1571
Postcode area level	0.5023	0.5112	0.5126	0.4619
Property level	0.9725	0.9723	0.9718	0.9689
Bryk/Raudenbush-R² (compared to model 1)				
City level (constant)	0.3046	0.3465	0.3450	0.6024
Postcode area level (constant)	0.1537	0.0765	0.1059	0.1127
Property level (constant)	0.3677	0.3800	0.3944	0.3943
Measurement occasion level (residual)	0.1759	0.1687	0.1708	0.1708
N	4,233	4,233	4,233	4,233
*** $P > z = 0.001$ {...} = z-score ** $P > z = 0.01$ [...] = log back transformation * $P > z = 0.05$ (...) = standard error				

Source: Own illustration.

3.4.4 Random Intercept / Random Coefficient Model

As outlined in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, the examination of random effects in this study focuses on potential slope variances at the city level, since this perspective promises applicable insights from a real estate perspective. The analysis strategy is analogous to the fixed effects in the prior section. Random effects are individually tested for significance and, afterwards, examined together on a level by level basis. Estimation results are summarized in Table and Table .

First level random coefficients: In an individual examination, the variance of the 'Year' coefficient is expected to be 0.0001362 with a standard error of 0.0000686. The simple z -test ($z = 1.99$) results in a (one-sided) p -value of $p < 0.05$, which indicates significance.⁵¹⁷ A comparative likelihood-ratio test with Model 9 also proved significant ($p < 0.001$).⁵¹⁸ The covariance between the random coefficient of 'Year' and the intercept was estimated 0.0001225 with a standard error of 0.00055 and, thus, it is not significant ($z = 0.22$). A corresponding likelihood-ratio test of Model 10 against an identical model that assumes all covariances are zero was also not significant.

⁵¹⁷ See section **Fehler! Verweisquelle konnte nicht gefunden werden.** for a discussion of the application of one-sided significance tests for variances.

⁵¹⁸ SNIJDERS/BOSKER (2012), p. 99 point out that likelihood-ratio tests need to be adapted when testing random effects, since the new model will include an estimate of the slope variance but also an estimate of the covariance between the slope and the intercept. For this purpose, the authors suggest to test the deviance difference between two nested models against a mixture distribution reflecting the mean of the chi-squared distribution with $df = p+1$ and the chi-squared distribution with $df = p$.

Table 14: Random-Intercept/Random-Coefficient Model (Part 1)

	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Fixed Part							
City level							
City Size	.1248236** [13.29%] {3.11}	.1118253** [11.83%] {2.80}	.115805** [12.28%] {3.22}	.1028695** [10.83%] {2.73}	.1168969** [12.40%] {3.18}	.1084808** [11.46%] {2.96}	.1122312** [13.01%] {3.06}
Postcode area level							
-							
Property level							
Brand Status	.1640147*** [17.82%] {6.01}	.1573658*** [17.04%] {5.75}	.1635013*** [17.76%] {6.06}	.1617847*** [17.56%] {6.00}	.16558*** [18.01%] {6.10}	.1868075*** [20.54%] {5.32}	.1545768*** [16.72%] {5.75}
Usable Area	.0219872** [2.22%] {3.14}	.0224434** [2.27%] {3.18}	.0260355*** [2.64%] {3.72}	.020616** [2.08%] {2.96}	.021682** [2.19%] {3.11}	.0217414** [2.20%] {3.12}	.0518819** [5.33%] {2.70}
Measurement occasion level							
Year	-.0102953*** [-1.03%] {-3.59}	-.0057505*** [-0.58%] {-7.26}	-.0068302*** [-0.69%] {-8.89}	-.0083013** [-0.83%] {-3.05}	-.0099356*** [-1.00%] {-3.77}	-.0099847*** [-1.00%] {-3.78}	-.0103999*** [-1.05%] {-3.89}
Building Age	-.0046884*** [-0.47%] {-10.01}	-.0072684*** [-0.73%] {-5.85}	-.0046608*** [-0.47%] {-10.06}	-.0060764*** [-0.61%] {-6.67}	-.0046922*** [-0.47%] {-10.07}	-.0046771*** [-0.47%] {-10.06}	-.0044397*** [-0.44%] {-9.64}
Rent	.0010814*** [0.11%] {26.23}	.0010845*** [0.11%] {25.99}	.0013509*** [0.14%] {8.69}	.001306*** [0.13%] {9.09}	.0012855*** [0.13%] {9.55}	.0012784*** [0.13%] {9.59}	.0012857*** [0.13%] {9.30}
Intercept (constant)	7.55177*** [1,904.11] {168.82}	7.533959*** [1,870.50] {166.70}	7.55793*** [1,915.88] {188.88}	7.539298*** [1,880.51] {176.62}	7.553461*** [1,907.33] {183.56}	7.544893*** [1,891.06] {179.64}	7.553233*** [1,906.90] {183.75}
Random Part							
City level							
Variance (Year)	.0001362 (.0000686)			.0001164 (.0000586)	.0001117 (.0000579)	.0001121 (.0000579)	.0001157 (.0000614)
Variance (Building Age)		.0000205 (.0000123)		8.52e-06 (7.42e-06)			
Variance (Rent)			3.12e-07 (1.66e-07)	2.72e-07 (1.52e-07)	2.15e-07 (1.27e-07)	2.10e-07 (1.26e-07)	2.33e-07 (1.39e-07)
Variance (Usable Area)							.0046342 (.0024539)
Variance (Brand Status)						.0051256 (.0055776)	
Variance (intercept)	.0212232 (.0087186)	.0220676 (.0092175)	.0174017 (.0073936)	.0202169 (.0086189)	.0185793 (.0078015)	.0196398 (.0084039)	.0186031 (.0080859)
Cov (year, intercept)	.0001225 (.00055)			.0001017 (.0004836)	.0001546 (.0004688)	.0002025 (.000484)	.0002812 (.0005025)
Cov (Year, Building Age)				-.0000119 (.0000149)			
Cov (Year, Rent)				1.28e-06 (2.05e-06)	-7.64e-07 (1.66e-06)	-7.83e-07 (1.66e-06)	-7.63e-07 (1.75e-06)
Cov (Year, Brand Status)						-.0001873 (.0004787)	
Cov (Year, Usable Area)							-.0001548 (.0002914)
Cov (Building Age, intercept)		.0001769 (.0002387)		.0001426 (.0001657)			
Cov (Building Age, Rent)				-1.29e-06 (8.37e-07)			
Cov (Rent, constant)			-.0000374 (.0000251)	-.0000328 (.0000252)	-.0000327 (.0000221)	-.0000321 (.0000226)	-.0000336 (.0000232)
Cov (Rent, Brand Status)						-3.29e-06 (.0000205)	
Cov (Rent, Usable Area)							9.43e-06 (.0000121)
Cov (Brand Status, intercept)						-.0032197 (.0060682)	
Cov (Usable Area, intercept)							-.0022536 (.0032944)
Postcode area level							
Variance (intercept)	.0397774 (.005837)	.0399369 (.005962)	.038795 (.005708)	.0388194 (.0057439)	.0389086 (.0057263)	.03872 (.0056928)	.0407126 (.0059508)
Property level							
Variance (intercept)	.06715 (.0034288)	.0671874 (.0035229)	.0656168 (.0033545)	.0653265 (.0033773)	.0664994 (.0034017)	.0660422 (.0033996)	.0638158 (.0032757)
Variance (first-level residuals)	.0038232 (.0000991)	.0039302 (.0001026)	.0039734 (.0001027)	.0037575 (.0000976)	.0037606 (.0000977)	.0037604 (.0000977)	.0036891 (.0000958)
Total variance	0.1319429	0.1324805	0.1260502	0.1269898	0.128014	0.1275892	0.1268628

Source: Own illustration.

Table 15: Random-Intercept/Random-Coefficient Model (Part 2)

	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Log-likelihood	3,352.93	3,317.09	3,316.22	3,378.75	3,375.26	3,376.54	3,407.18
Deviance	-6,705.86	-6,634.19	-6,632.44	-6,757.49	-6,750.52	-6,753.07	-6,814.37
Maddala ML-R²							
Compared to model 0	0.9400	0.9390	0.9390	0.9407	0.9406	0.9407	0.9415
Compared to model 1	0.2495	0.2366	0.2363	0.2586	0.2573	0.2578	0.2685
Intraclass Correlation Coefficient							
City level	0.1617	0.1659	0.1383	0.1586	0.1474	0.1865	0.1712
Postcode area level	0.3011	0.3000	0.3084	0.3027	0.3039	0.2903	0.3113
Property level	0.5083	0.5046	0.5217	0.5094	0.5194	0.4951	0.4893
Bryk/Raudenbush-R² (compared to model 1)							
City level (constant)	0.5883	0.5719	0.6624	0.6078	0.6396	0.6190	0.6391
Postcode area level (constant)	0.1124	0.1088	0.1343	0.1337	0.1318	0.1360	0.0915
Property level (constant)	0.3852	0.3849	0.3992	0.4019	0.3912	0.3953	0.4157
Measurement occasion level (residual)	0.2187	0.1968	0.1880	0.2321	0.2315	0.2315	0.2461
N	4,233	4,233	4,233	4,233	4,233	4,233	4,233
*** $P > z = 0.001$ {...} = z-score "Cov" = Covariance ** $P > z = 0.01$ [...] = log back transformation * $P > z = 0.05$ (...) = standard error							

Source: Own illustration.

The variance of the random coefficient of 'Rent' that was estimated with 0.000000312 and a standard error of 0.000000166 was found to be significant according to a z -test ($z = 1.88$). Similarly, the comparative likelihood-ratio test between Model 12 and Model 9 implied a significant contribution to the model fit ($p < 0.001$). No significant covariance was found between the random coefficient and the intercept. The z -test of the covariance that was estimated -0.0000374 with a standard error of 0.0000251 proved insignificant ($z = 1.49$) as well as a likelihood-ratio test with a zero covariance model.

The random coefficient for 'Building Age' was also found significant according to the z -test ($z = 1.67$), based on an estimated variance of 0.0000205 with a standard error 0.0000123. A significant ($p < 0.001$) improvement of the model fit was detected with the help of a likelihood-ratio test that compares Model 11 to Model 9. The covariance between the random coefficient and the intercept was not significant in a z -test ($z = 0.74$). It was estimated with 0.0001769 with a standard error of 0.0002387. A comparison with a model in which all covariances are kept zero did not prove significant in a likelihood-ratio test.

Model 13 integrates all three random coefficients. Here, only the regression coefficients for 'Year' and 'Rent' show a significant variance between cities (Year: $z = 1.97$, one-sided $p < 0.05$; Rent: $z = 1.79$, one-sided $p < 0.05$; Building Age: $z = 1.15$, one-sided $p > 0.05$).

This result is supported by a series of comparative likelihood-ratio tests between this model, Models 10, 11, and 12, and the model variations that contain only two of the new random effects. The likelihood-ratio tests indicate a significant ($p < 0.001$) improvement of the model fit over simpler models that only allow for one of the first-level coefficients to vary across cities. In a similar manner, the model fit of Model 13 is superior to models that include random coefficients for 'Year' and 'Building Age' or 'Rent' and 'Building Age' ($p < 0.001$). However, the likelihood-ratio test was not significant for the comparison with a model that allows for the coefficients of 'Year' and 'Rent' to vary randomly. Consequently,

the simpler model version (Model 14) is kept for the further analysis of higher level random coefficients.

In Model 14, the random coefficient variance for 'Year' was estimated with 0.0001117 and a standard error of 0.0000579, and, for 'Rent', the respective output was 0.000000215 and 0.000000127. For both variances, the z -tests were significant (year: $z = 1.93$, one-sided $p < 0.05$; net rental income: $z = 1.69$, one-sided $p < 0.05$). Comparing the model with Models 9, 10, and 12 on the basis of likelihood-ratio tests leads to the conclusion that Model 14 promises a significantly ($p < 0.001$) improved model fit.

The covariance between the random coefficient for 'Year' and the intercept is expected to be 0.0001546 with a standard error of 0.0004688, and thus, insignificant ($z = 0.33$). For 'Rent', the covariance was estimated with -0.0000327 and a standard error of 0.0000221, leading to a non-significant z -test ($z = 1.48$). Between both random coefficients, the covariance was -0.000000764 with a standard error of 0.00000166, which was insignificant ($z = 0.46$). A likelihood-ratio test against a model that keeps all covariances at zero was also not found to be significant.

Second level random coefficients: In Model 15, a random coefficient for 'Brand Status' was introduced and estimated to have a variance of 0.0051256 and a standard error of 0.0055776, resulting in a non-significant z -test ($z = 0.92$) and a non-significant likelihood-ratio test when compared with Model 14. The covariances with the intercept and other random coefficients were non-significant, neither according to z -tests (intercept: $z = 0.53$; year: $z = 0.39$; rent: $z = 0.16$) nor a comparative likelihood-ratio test as opposed to a model with all covariances kept at zero.

In Model 16, the regression coefficient of 'Usable Area' was allowed to vary across cities. The variance was expected to be 0.0046342 with a standard error of 0.0024539. A z -test was found to be significant ($z = 1.89$), and a likelihood-ratio test indicated a significantly ($p < 0.001$) improved model fit as compared to Model 14.

Covariances with the random coefficients of 'Year' (covariance: -0.0001548, standard error: 0.0002914, $z = 0.53$), 'Rent' (covariance: 0.00000943, standard error: 0.0000121, $z = 0.78$), and the intercept (covariance: -0.0022536, standard error: 0.0032944, $z = 0.68$) were non-significant in a simple z -test. A likelihood-ratio test comparing Model 16 with an identical model with zero covariances was non-significant as well.

Following this analysis strategy, a joint consideration of both random coefficients in one model was not carried out, since the between-city variance in the relationship of 'Brand Status' and the outcome variable was not separately significant. The explanatory variable 'Usable Area' is kept in the model as a random effect. Model 16 is used as a basis for the examination of potential interaction effects in the following section.

The introduction of random coefficients for 'Year', 'Rent', and 'Usable Area' in Model 16 led to a slight reduction in the total unexplained variance of the outcome variable from 0.130 in Model 9 to 0.127. Maddala's $ML-R^2$ indicates that the variance explanation has improved by app. 26.9% against Model 1. Looking at the Bryk/Raudenbush R^2 , the random coefficients make a contribution at three of the four levels. The explained proportion of the variance is 63.9% at the city level, 41.6% at the property level, and 24.6% at the

measurement occasion level. On postcode area level, the R^2 indicates a reduction in the proportion of explained variance to 9.2%.

The estimated regression coefficients of the random effects indicate a stronger relationship between the predictors and the dependent variable. In comparison to Model 9, the coefficient for 'Year' was estimated at -0.0103999 (Model 9: -0.0069986), 0.0012857 for 'Rent' (Model 9: 0.0011103), and 0.0518819 for 'Usable Area' (Model 9: 0.0266294).

The between-city variances of the three random coefficients were found to be significant at level $p < 0.05$ according to one-sided z -tests (Year: $z = 1.88$; Rent: $z = 1.67$; 'Usable Area': $z = 1.89$). A comparative likelihood-ratio test over models that only allow for one or two random effects was significant ($p < 0.001$), suggesting an improved fit for Model 16.

The covariances were checked for significance via z -tests and a likelihood-ratio test against an identical model in which all covariances are kept at zero. In all cases, the covariances were not found to be significant (Year/intercept: $z = 0.56$; Rent/intercept: $z = 1.45$; Usable Area/intercept: $z = 0.68$; Year/rent: $z = 0.44$; Year/Usable Area: $z = 0.53$; Rent/Usable Area: $z = 0.78$).⁵¹⁹

3.4.5 Random Intercept / Random Coefficient Model with Interaction Effects

In a final modeling step, interaction effects between 'Brand Status' and its covariates were individually added to the model. All effects that had proven to be individually significant were rechecked in a joint model. Table and Table provide a summary of the model estimations.

The interaction effect between 'Brand Status' and 'Year' that was examined in Model 17 was not significant according to a z -test ($z = -1.09$) and a likelihood-ratio test over Model 16. Similarly, no significant interaction was found between 'Brand Status' and 'Building Age' ($z = -1.84$) in Model 18. In Model 19, an interaction between 'Brand Status' and 'Rent' was estimated with -0.0003286 ($z = -2.59$, $p < 0.01$) and also proved to be a significant contribution to the overall model fit in a likelihood-ratio test over Model 16 ($p < 0.01$). Between 'Brand Status' and 'Usable Area', a moderately significant ($z = -1.98$, $p < 0.05$) positive (0.04) interaction effect was estimated in Model 20. A likelihood-ratio test comparing Model 20 and Model 16 was also significant ($p < 0.05$). The interaction effect between 'Brand Status' and 'City Size' that was added in Model 21 proved to be non-significant in a z -test ($z = -1.93$) and in a comparative likelihood-ratio test over Model 16.

The individually significant interaction effects were examined together in Model 22. According to a z -test, the interaction effect between 'Brand Status' and 'Usable Area' was no longer significant ($z = -1.89$), whereas the interaction between 'Brand Status' and 'Rent' remained significant ($z = -2.52$, $p < 0.05$). A comparison via likelihood-ratio test with Model 19 that only contains the interaction between the 'Brand Status' and 'Rent' was not significant, while a likelihood-ratio test over Model 20 that only considers an interaction be-

⁵¹⁹ In all subsequent models, covariances were found to be non-significant based on z -tests. In the same way, non-significant likelihood-ratio tests implied that they did not significantly contribute to the model fit in comparison to respective models, where all covariances were held to zero. For this reason, the estimates of the covariances and their standard errors are not discussed in detail in the further analysis.

tween the 'Brand Status' and 'Usable Area' was significant ($p < 0.05$). This leads to the conclusion that, in the model in which both interaction effects are included, no significant improvement of the model fit is achieved compared to a model that only accounts for an interaction between 'Brand Status' and Rent. Consequently, the interaction effect between 'Brand Status' and 'Usable Area' is not retained by the model.

Following the analysis strategy, Model 19 is preferred to the other models and subsequently examined in more detail for the final examination of the study objectives and a more detailed interpretation of the findings.

3.4.6 Examination of the Final Model

In Model 19, the intercept was estimated with app. 7.5531 (95% conf. int.: 7.4726 to 7.6337), equaling a conditional geometric mean value of app. 1,906.67 EUR/m² (95% conf. int.: 1,759.17 to 2,066.68 EUR/m²) for an observation with all predictors set zero, thus representing a non-branded property with mean parameter values in the original, un-centered variable scales.

A significant ($p < 0.001$), negative relationship between the predictor 'Year' and 'Logvalue' was detected. The mean regression coefficient across all cities was estimated at -0.0103 (95% conf. int.: -0.0155 to -0.0051), corresponding to an expected reduction in the conditional geometric mean of the original outcome variable value by app. 1.0% (95% conf. int.: -1.6% to -0.5%). The average non-branded property in the sample apparently suffered from a decrease in value from year to year. However, taking into account the expected between-city variance (0.000114, $p < 0.05$) of the regression coefficient, a 95% predictive interval, which runs from $(-0.0103 - 1.96\sqrt{0.0001}) = -0.0299$ to $(-0.0103 + 1.96\sqrt{0.0001}) = 0.0093$, can be determined. Therefore, assuming a normal distribution, the middle 95% of cities are expected to have a slope between -0.0299 and 0.0093, implying that in some cities, the conditional geometric mean in property values saw an annual increase by up to app. 0.9%, whereas, in other cities, a decrease of app. 3.0% was realized. The findings indicate a general downwards trend in office property values in the sample cities. On the other hand, it becomes apparent that there were significant differences in the development of the distinct regional sub-markets.

The predictor 'Building Age' was found to yield a significant ($p < 0.001$), negative relationship with the outcome variable. A one unit increase in 'Building Age' is associated with an estimated decrease in the arithmetic mean of 'Logvalue' by 0.0045 units (95% conf. int.: -0.0054 to -0.0035), equaling a 0.5% reduction (95% conf. int.: -0.54% to -0.35%) in the geometric mean of 'Value'. Since no significant slope variance was detected at the city level, the negative relationship is expected to be stable across cities.

For the explanatory variable 'Rent', a significant ($p < 0.001$), positive relationship with 'Logvalue' was estimated. A one unit increase in 'Rent' is expected to be related to a mean 0.0013 unit (95% conf. int.: 0.0011 to 0.0016), increase in the mean of 'Logvalue' for an average non-branded property, which corresponds to a 0.13% increase in the geometric mean of the untransformed dependent variable.

Table 16: Random-Intercept/Random-Coefficient Model with Interaction Effects (Part 1)

	Model 17	Model 18	Model 19	Model 20	Model 21	Model 22
Fixed Part	City level					
	.1120394**	.1132408**	.112766**	.1145308**	.121104**	.1149721**
	City Size					
	[11.86%] (3.06)	[11.99%] (3.09)	[11.94%] (3.07)	[12.13%] (3.12)	[12.87%] (3.28)	[12.18%] (3.13)
	Postcode area level					
	Property level					
	.1539483***	.1189217***	.1658565***	.1892934***	.1562574***	.198542***
	Brand Status					
	[16.64%] (5.72)	[12.63%] (3.58)	[18.04%] (6.09)	[20.84%] (5.90)	[16.91%] (5.82)	[21.96%] (6.15)
	.0518085**	.0511292**	.0515497**	.0562068**	.0509066**	.0556314**
	Usable Area					
	[5.32%] (2.69)	[5.23%] (2.68)	[5.29%] (2.69)	[5.78%] (2.93)	[5.22%] (2.74)	[5.72%] (2.91)
	Measurement occasion level					
	Year					
	[-1.02%] (-3.82)	[-1.03%] (-3.88)	[-1.04%] (-3.88)	[-1.05%] (-3.90)	[-1.01%] (-3.92)	[-1.05%] (-3.89)
	Building Age					
	[-0.45%] (-9.65)	[-0.43%] (-9.21)	[-0.45%] (-9.67)	[-0.44%] (-9.52)	[-0.45%] (-9.66)	[-0.44%] (-9.56)
	Rent					
	[0.13%] (9.23)	[0.13%] (9.24)	[0.13%] (9.56)	[0.13%] (9.30)	[0.13%] (9.28)	[0.13%] (9.55)
	Interaction effects					
	Brand Status * Year					
	[-0.20%] (-1.09)					
	Brand Status * Building Age					
		[-0.25%] (-1.84)				
	Brand Status * Rent					
			[-0.03%] (-2.59)			[-0.03%] (-2.52)
	Brand Status * Usable Area					
				[-4.53%] (-1.98)		[-4.30%] (-1.89)
	Brand Status * City Size					
					[-6.96%] (-1.93)	
	Constant	7.553428***	7.555013***	7.553112***	7.553696***	7.554103***
		[1,907.27]	[1910.30]	[1,906.67]	[1,907.78]	[1,908.56]
		(183.92)	(184.07)	(183.80)	(184.29)	(183.87)
Random Part	City level					
	Variance (Year)					
	(.0000663)	(.00006)	(.0000611)	(.0000626)	(.0000595)	(.0000618)
	Variance (Rent)					
	2.41e-07 (1.42e-07)	2.39e-07 (1.41e-07)	2.31e-07 (1.36e-07)	2.33e-07 (1.39e-07)	2.34e-07 (1.39e-07)	2.30e-07 (1.38e-07)
	Variance (Usable Area)					
	.0046792 (.002477)	.0045663 (.0024036)	.0045913 (.002363)	.0045328 (.0024247)	.0042049 (.0022103)	.0044805 (.0023971)
	Variance (intercept)					
	.0185624 (.0078914)	.0185131 (.008023)	.0185209 (.0078036)	.0185756 (.0080545)	.0184933 (.008024)	.0185016 (.0080277)
	Postcode area level					
	Variance (intercept)					
	.040746 (.0059525)	.0403458 (.0059117)	.0411279 (.0059802)	.040586 (.0059178)	.0406097 (.0059147)	.0409751 (.0059481)
	Property level					
	Variance (intercept)					
	.063831 (.0032733)	.0638371 (.0032753)	.0635895 (.0032642)	.0633664 (.0032585)	.0635803 (.003263)	.0631876 (.0032516)
	Variance (first-level residuals)	.0036873 (.0000958)	.0036869 (.0000958)	.0036837 (.0000957)	.0036926 (.0000959)	.0036869 (.0000958)
	Total variance (constant)	0.126827	0.126383	0.126922	0.126374	0.126203

Source: Own illustration.

Table 17: Random-Intercept/Random-Coefficient Model with Interaction Effects (Part 2)

	Model 17	Model 18	Model 19	Model 20	Model 21	Model 22
Log-likelihood	3,407.77	3,408.86	3,410.54	3,409.12	3,409.02	3,412.29
Deviance	-6,815.55	-6,817.72	-6,821.07	-6,818.24	-6,818.03	-6,824.57
Maddala ML-R²						
Compared to model 0	0.9415	0.9416	0.9416	0.9416	0.9416	0.9416
Compared to model 1	0.2687	0.2690	0.2696	0.2691	0.2691	0.2702
Intraclass Correlation Coefficient						
City level	0.1774	0.1770	0.1765	0.1775	0.1745	0.1764
Postcode area level	0.3096	0.3078	0.3125	0.3101	0.3107	0.3129
Property level	0.4850	0.4871	0.4831	0.4842	0.4865	0.4825
Bryk/Raudenbush-R² (compared to model 1)						
City level (constant)	0.6399	0.6409	0.6407	0.6397	0.6413	0.6460
Postcode area level (constant)	0.0907	0.0997	0.0822	0.0943	0.0938	0.0860
Property level (constant)	0.4156	0.4155	0.4178	0.4198	0.4179	0.4204
Measurement occasion level (residual)	0.2464	0.2465	0.2472	0.2454	0.2457	0.2463
N	4,233	4,233	4,233	4,233	4,233	4,233
*** P> z = 0.001 {...} = z-score ** P> z = 0.01 [...] = log back transformation * P> z = 0.05 (...) = standard error						

Source: Own illustration.

However, a small, but significant between-city slope variance (0.0046, $p < 0.05$) was found, suggesting a 95% predictive interval between $(0.0013 - 1.96\sqrt{0.000000231}) = 0.0004$ and $(0.0013 + 1.96\sqrt{0.000000231}) = 0.0022$. Assuming a normal distribution, the middle 95% of cities can be expected to show a positive relationship between 'Rent' and 'Logvalue', ranging from a 0.04% up to a 0.22% increase in the conditional geometric mean of Value. In fact, the coefficient and its variance appear comparatively small. However, taking into consideration the wide scale of the predictor, the dependent variable 'Value' is apparently associated with the variable 'Rent' to a large share.

The model estimation showed a significant ($p < 0.01$), positive relationship between 'Usable Area' and 'Logvalue'. Across cities, an upward shift from one size category to the next is expected to correspond with a 0.0515 unit (95% conf. int.: 0.0140 to 0.0891) increase in the arithmetic conditional mean of the outcome variable. Correspondingly, when all co-variables are fixed, a one unit increase in 'Usable Area' is associated with a 5.3% (95% conf. int.: 1.4% to 9.3%) increase in the geometric mean of 'Value' regardless of the city. Accounting for the significant between-city variance (0.0046, $p < 0.05$) of the regression coefficient, a 95% predictive interval can be determined, thus ranging from $(0.0515 - 1.96\sqrt{0.0046}) = -0.0814$ to $(0.0891 + 1.96\sqrt{0.0046}) = 0.2220$. Looking at the original untransformed variable, the middle 95% of the cities are expected to have a slope between -0.0814 and 0.2220, equaling a rate of change for the conditional geometric mean between -8.5% and 24.9%. Obviously, in some cities, higher usable areas are associated with a lower property value, whereas, in other cities, larger properties see considerably higher values than smaller properties.

A significant ($p < 0.01$), positive relationship between 'City Size' and the dependent variable was identified. The estimated regression coefficient is 0.1128 (95% conf. int.: 0.0408 to 0.1847), suggesting that, across cities, a one unit increase in 'City Size' is related to an 11.9% (95% conf. int.: 4.2% to 20.3%) increase in the conditional geometric mean of 'Value' when all covariates are fixed. No significant slope variance was detected for this explanatory variable on city level.

For the primary variable 'Brand Status', a significant ($p < 0.001$) regression coefficient of app. 0.1659 (95% conf. int.: 0.1125 to 0.2192) was estimated, corresponding to an expected 18.1% change (95% conf. int.: 11.9% to 24.5%) in the conditional geometric mean of 'Value' when all covariates are fixed and interacting variables equal zero. The relationship between 'Brand Status' and the outcome variable was found to be stable across cities, since no significant city-level slope variance was detected.

A significant ($p < 0.01$) interaction effect (-0.0003, 95% conf. int.: -0.0006 to -0.0001) was only estimated between 'Brand Status' and 'Rent'. This allows for two different interpretations: (1) The effect of 'Brand Status' is moderated by 'Rent' so that higher rental levels are associated with a smaller regression coefficient of 'Brand Status'. (2) The effect of 'Rent' is moderated by 'Brand Status', implying that, for branded properties, the net rental income has a weaker relationship with the outcome variable. From a real estate perspective, both approaches might be principally plausible: For valuations of properties with a high rental level, it can be assumed that their brand status is less important in the course of a standardized valuation and, as a result, has a smaller influence on the value in terms of additional premiums or a reduced discount rate. On the other hand, it can be argued that the contract rent might be less important when valuing a branded property in comparison to a non-branded property. This is due to e.g. a reduced perceived investment risk. Since the causal relationship between both variables has not been investigated in the existing real estate literature, it seems appropriate to follow HOX's (2010) suggestion to interpret the contextual effect as a moderator of the lower-level effect.⁵²⁰ Consequently, the negative interaction effect implies that, for branded properties, the positive relationship between 'Rent' and the conditional arithmetic mean of 'Logvalue' is weakened in comparison to non-branded properties.

A comparison of the fitted values for branded and non-branded observations at the city level can help to highlight the predicted value differential between observations of branded and non-branded properties while accounting for all fixed and random effects.⁵²¹ Figure visualizes the predicted geometric mean of property values in the sample cities.

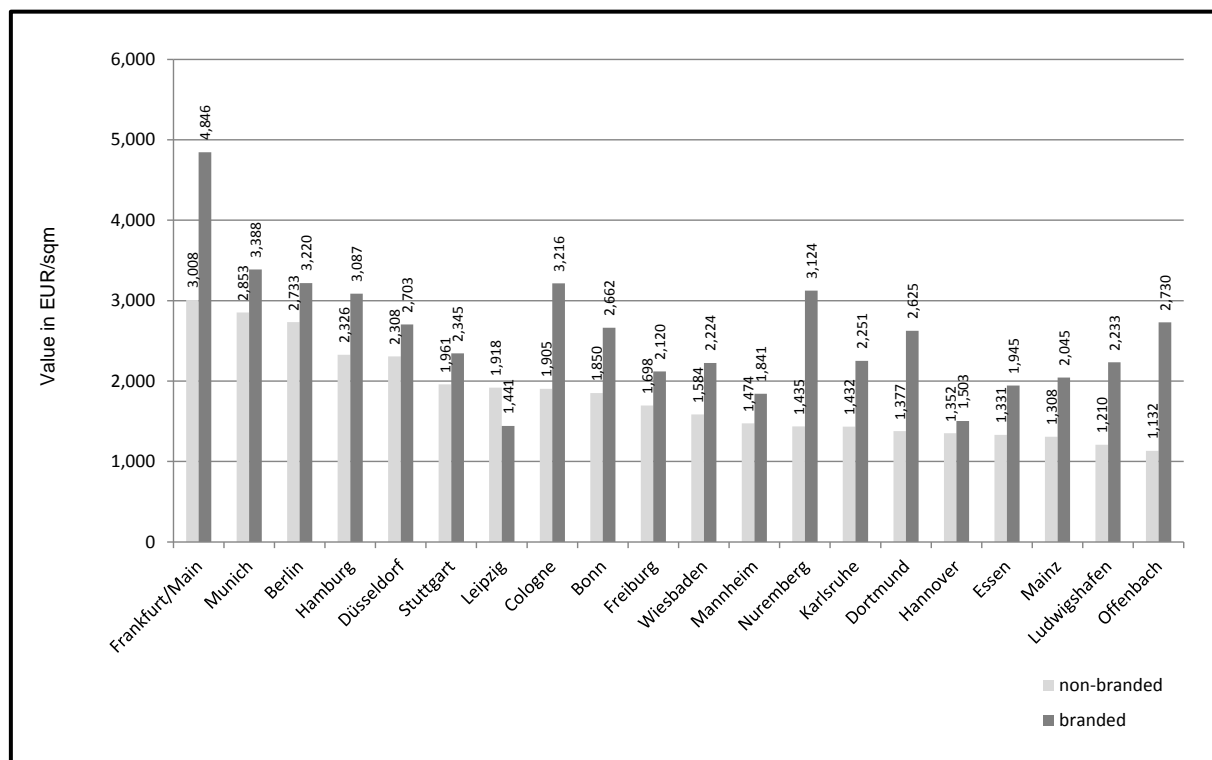
In almost all cities, a property branding is associated with a higher predicted property value. The three largest differences were predicted for Frankfurt/Main, Nuremberg, and Offenbach. The three smallest were predicted for Stuttgart, Mannheim, and Hannover. For Leipzig, a negative value differential was predicted between the fitted values for branded and non-branded properties. A brief inspection of the original dataset for this city on the basis of unpaired t -tests with unequal variances revealed that branded observations in

⁵²⁰ See HOX (2010), pp. 66-67.

⁵²¹ The fitted values are equal to the fixed-portion linear predictor plus contributions based on predicted random effects. See TABACHNICK/FIDELL (2007), pp. 83-85.

Leipzig show a significantly lower mean in 'Rent' ($p < 0.001$), a higher mean in 'Building Age' ($p < 0.001$) and a lower mean in 'Usable Area' ($p < 0.01$) than with non-branded observations in this city. For the year of observation, no significant difference was detected. Assumingly, in the case of Leipzig, the positive coefficient of 'Brand Status' is outweighed by the low parameter values of the covariates, leading to lower fitted values for the branded properties.

Figure 17: Fitted Values of Branded and Non-Branded Properties by City



Source: Own illustration.

The total unexplained variance of 'Logvalue' is 0.1269 (Model 1: 0.2104), and the Maddala $ML-R^2$ suggests an improvement of the variance explanation by 27.0% in comparison to Model 1, which only contains the random intercept, and by 94.2% in comparison to Model 0, which does not account for the hierarchical data structure. The Bryk/Raudenbush R^2 indicates an explained variance of app. 64.1% on the city level, 8.2% on the postcode area level, 41.8% on the property level, and 24.7% on the measurement occasion level. In comparison to Model 16, introducing the interaction effect in Model 19 only moderately contributed to the variance explanation. However, the overall model fit substantially improved in comparison to Model 1.

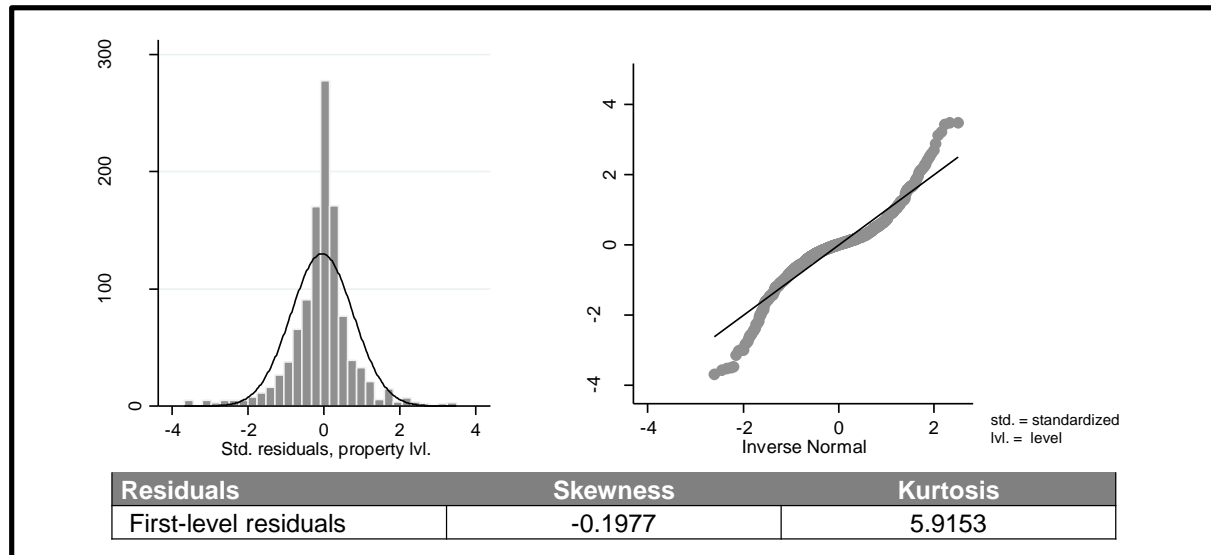
3.4.7 Residual Diagnostics

Finally, the first-level residuals and higher level random effects were inspected regarding the assumptions of normality and homoscedasticity.⁵²² A visual inspection of the simple histograms and quantile-quantile plots of the standardized first-level residuals against their normal scores was carried out in order to check for deviations from the normal distribution.

⁵²² See Hox (2010), p. 23.

TABACHNICK/FIDELL (2007) point out that, in large samples, the impact of a departure from normal skewness and kurtosis diminishes.⁵²³ Thus, a visual inspection of the distribution should be preferred over significance testing and rigid cut-off criteria. Nevertheless, skewness and kurtosis values were additionally considered as indicators of deviations from normal.⁵²⁴ Figure displays the respective graphs.

Figure 18: Quantile-Quantile Plots and Histograms of Standardized First-Level Residuals



Source: Own illustration.

The distribution is more peaked than normal (leptokurtic) and is moderately skewed. However, the absolute values for skewness (-0.198) and kurtosis (5.915) are within the ranges that are usually discussed as cut-off criteria. CURRAN/FINCH/WEST (1996), for instance, suggest a deviation by ± 2 for skewness and by ± 4 for kurtosis as boundaries for an acceptable approximation to normal distribution. Other authors are less lenient, requiring maximum deviations between ± 1 and ± 2 for skewness and between ± 1 and ± 3 for kurtosis.⁵²⁵ Altogether, considering the central limit theorem, the deviation of the first-level residuals from the normal distribution seems acceptable when regarding the sample size of the study.

The diagnostic approach that was taken for the first-level residuals was also applied to the random intercepts and slopes on the different levels using their best linear unbiased predictions (BLUPs) in order to check for normality. Figure provides an overview of the histograms and quantile-quantile plots as well as the skewness and kurtosis values.

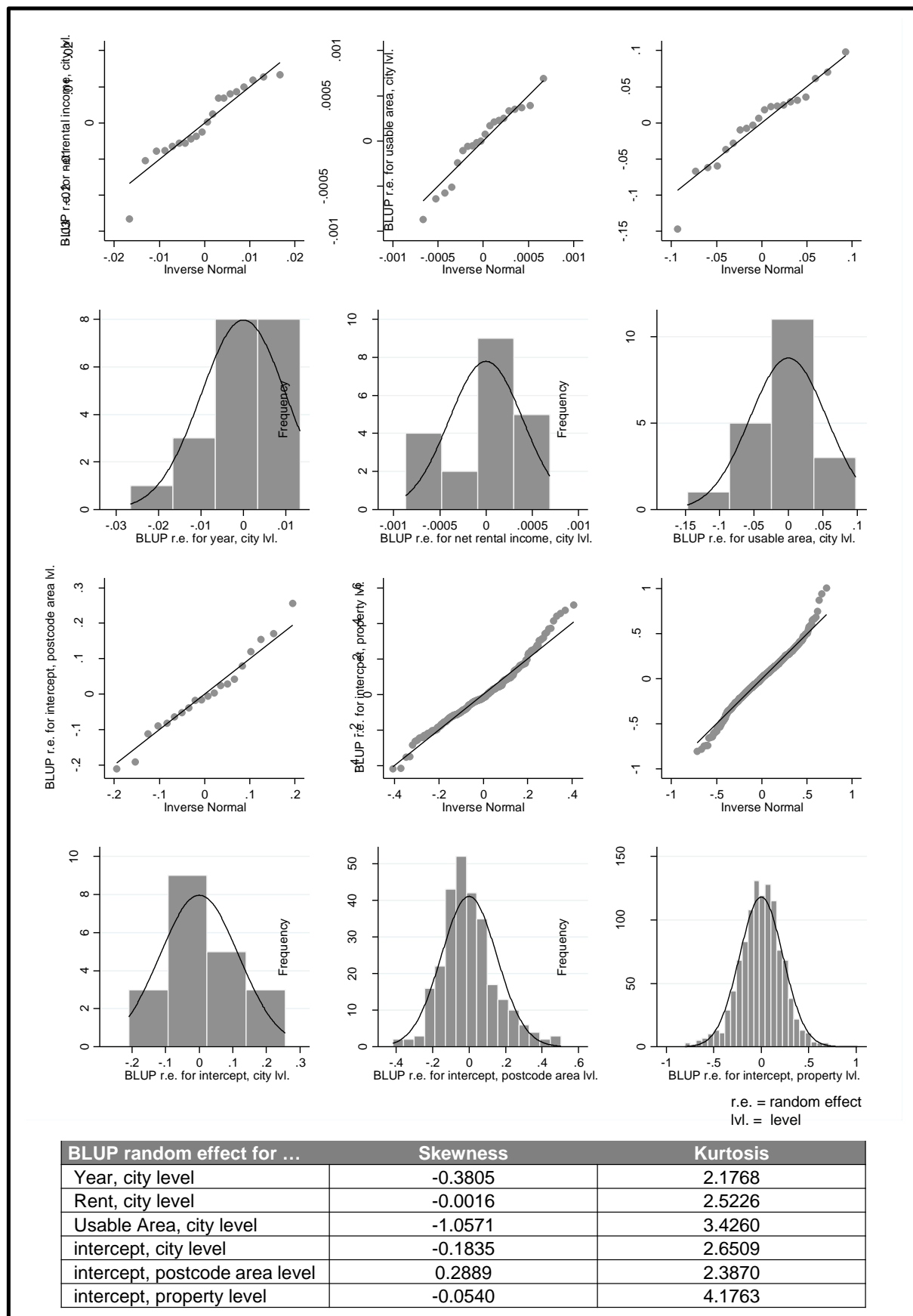
A visual inspection of the graphs and assessment of the values for skewness and kurtosis found that the city level BLUPs for the random slopes of 'Year' and 'Rent' as well as the BLUPs of the random intercepts on city and postcode area level approximate a normal distribution. For these cases, the deviations of skewness and kurtosis are within rigid boundaries of ± 1 from normal.

⁵²³ See TABACHNICK/FIDELL (2007) p. 80.

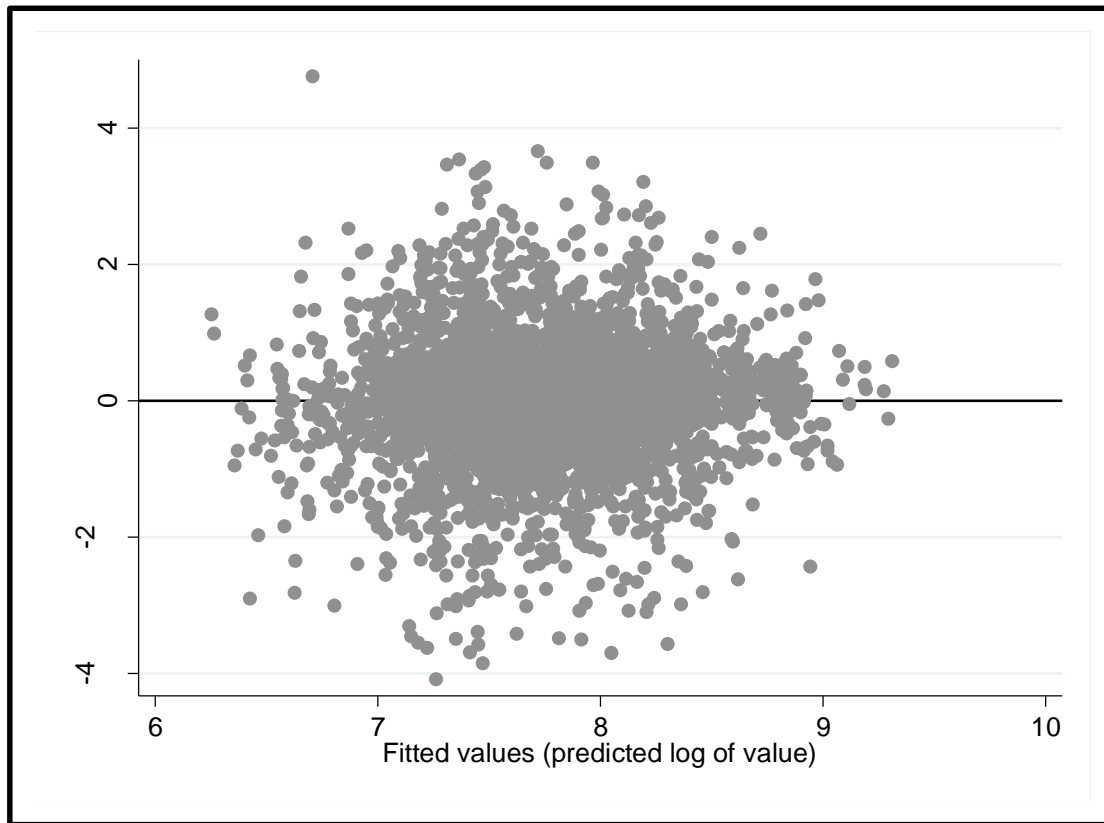
⁵²⁴ See BELL et al. (2010), pp. 1-2.

⁵²⁵ GARSON (2012), pp. 18-20; CURRAN/WEST/FINCH (1996), p. 26.

Figure 19: Quantile-Quantile Plots and Histograms of BLUPs for Random Effects



Source: Own illustration.

Figure 20: First-Level Residuals against Fitted Values

Source: Own illustration.

A larger deviation is realized in two cases. One case is the random slope for usable area, which has a skewness of -1.057, indicating a moderate level of asymmetry. Then there's the random intercept at the property level, which is slightly leptokurtic with a kurtosis of 4.176. Still, both deviations lie within the wider cut-off ranges discussed in literature, thereby considering the decreasing impact of skewness and kurtosis in larger samples, the random effects seem to sufficiently approximate normal distribution.

Finally, a scatter plot (see Figure) of first-level standardized residuals was inspected against fitted values to check for homoscedasticity. The oval shape of the scatter plot implies that the variance of the residuals is moderately smaller at the upper and lower boundaries of the range of fitted values than it is in the middle of their range. Altogether, however, residual variances appear similar for all fitted values, suggesting that the assumption of equal error variances is reasonable. The points of the plot are symmetrically distributed above and below their mean value of zero along the estimated regression line, also indicating a sufficiently fulfilled assumption of linearity.

Apparently, there are observations with standardized residual values that are larger than 3, implying that these cases might be outliers. Still, no further correction was conducted at this point, since a review of the outlying observations did not detect unrealistic deviations from real estate market standards and a further retrofitting of the model was not intended.

3.5 Summary, Conclusions, and Limitations

The final section in this chapter summarizes the main steps and findings of the study and strives to derive meaningful implications of the multilevel analysis for real estate practice. Moreover, the drawbacks and limitations of the study and its inferences are critically discussed.

Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.** focused on the problem set and the three main objectives of the study: (1) to investigate the relationship between properties' brand status and their economic performance in terms of their market value while accounting for relevant factors such as the year of observation, rent, building age, usable area, and the size of the respective city that are commonly considered in valuation practice; (2) to examine potential variances in this relationship between cities; and (3) to identify possible interaction effects between properties' brand status and its covariates.

In Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**, the IPD Investment Property Databank was introduced as the data source for this study while the definition and scaling of the variables were presented. Afterwards, the hierarchical structure of the dataset was emphasized and the preparatory steps towards the final dataset were also described.

The next chapter introduced multilevel modeling as an appropriate methodology in accounting for the nested data structure and discussed model assumptions as well as the sample requirements, model estimation methods, and as relevant approaches for significance testing and variance explanation that were applied in the analysis. Finally, a step-wise analysis strategy was outlined for exploratory model development

The results of an initial independent group *t*-test between branded and non-branded observations and a multiple linear regression were briefly summarized in Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.** before the successive development of the final multilevel model was described. On the basis of the pooled dataset, the preliminary *t*-test indicated a significantly ($p < 0.001$) larger geometric mean property value for the group of branded observations (3,115.05 EUR/m²) than for non-branded observations (2,230.54 EUR/m²). The regression results supported this finding, suggesting significant relationships for all independent variables, and the interaction effects between 'Brand Status' and 'Rent' as well as between 'Usable Area' and 'City Size'. The conditional geometric mean of the untransformed independent variable 'Value' was expected to be app. 14.3% ($p < 0.001$) higher for observations from branded properties than for observations from non-branded properties when all covariates are fixed and interacting variables were kept at zero.

Finally, in the last step of the multilevel analysis, a four-level random intercept random coefficient model with interaction effects was suggested. In this model, all independent variables showed significant relationships with the outcome variable. Across cities, negative relationships were detected for 'Year' and 'Building Age', while 'Rent', 'Usable Area' and 'City Size' showed positive regression coefficients. However, significant between-city variances in the regression slopes of 'Year', 'Rent', and 'Usable Area' were found, implying

that the relationship between these predictors and the outcome variable is not stable across the different macro locations.

Regarding the first objective of the study, a significant ($p < 0.001$) regression coefficient of 0.1659 (95% conf. int.: 0.1125 to 0.2192) was estimated for the explanatory variable 'Brand Status', corresponding to an expected 18.1% change (95% conf. int.: 11.9% to 24.5%) in the conditional geometric mean of 'Value'. With respect to the second study objective, no significant city-level slope variance was detected for the variable, suggesting a stable relationship with the outcome variable across cities. Looking at the third objective, a significant ($p < 0.01$) interaction effect (-0.0003, 95% conf. int.: -0.0006 to -0.0001) was identified between 'Brand Status' and 'Rent', implying that, for branded properties, the positive relationship between 'Rent' and the dependent variable is weakened in comparison to non-branded properties. Accounting for all fixed and random effects of the model, a comparison of the fitted values for branded and non-branded observations on city level indicated that a property branding is associated with a higher predicted property value in all cities of the sample apart from Leipzig.

The model fit was assessed in comparison to a simple model from the first modeling step that only contained the dependent variable. The total unexplained variance of 'Logvalue' was 0.1269 (Model 1: 0.2104), and Maddala ML- R^2 suggested an improvement of the variance explanation by 27.0%. The Bryk/Raudenbush- R^2 indicated an explained variance of app. 64.1% on city level, 8.2% on postcode area level, 41.8% on property level, and 24.7% on measurement occasion level.

Finally, the first-level residuals and higher level random effects were inspected on the basis of an examination of quantile-quantile plots, histograms, and the corresponding values for skewness and kurtosis. Additionally, a scatter plot of first-level residuals against the fitted values was considered. Altogether, no substantial violations of common boundaries were detected, leading to the conclusion that assumptions of normality and homoscedasticity were sufficiently fulfilled.

From a methodological perspective, the multilevel analysis proved appropriate in investigating the relationship between the brand status of a property and its economic performance in terms of its market value, while accounting for relevant covariates and the hierarchical structure of the dataset. Considering the obviously nested structure of real estate market data, it seems surprising that this method is not more commonly applied in real estate research. In fact, some studies relying on pooled datasets might suffer from violations of the independency assumption, leading to biases in the estimation results and to incorrect calculations of confidence intervals and significance levels. A comparison of the results from the single-level multiple regression and the multilevel analysis in this study emphasizes the potential fallacies (see Table). While the overall direction of the relationship between the explanatory variables and the outcome is identical, there are substantial differences in the size of the regression coefficients. Ignoring the hierarchical data structure, the single-level regression estimated a higher intercept and expected weaker relationships for 'Year', 'Building Age', 'Usable Area', and 'City Size' and a stronger relationship for 'Rent'. Furthermore, the significance level of 'Usable Area' and 'Rent' was lower according to the multilevel approach. For 'Brand Status', the multilevel model also estimated a

stronger relationship with 'Logvalue', expecting an increase of 18.0% in the conditional geometric mean of 'Value' instead of only 14.3%. The single-level regression model indicated significant interaction effects of 'Brand Status' with 'Rent', 'Usable Area', and 'City Size'. Only the interaction with 'Rent' proved to be significant in the hierarchical linear model. Looking at the apparent differences in the regression estimates, a more frequent consideration of data hierarchies seems useful for real estate studies dealing with spatial or longitudinal information.

Table 18: Comparison of Single-Level and Multilevel Model Estimates

Variable	Estimated coefficient	
	Single-level multiple linear regression model	Hierarchical linear model (model 19)
Year	-0.0079***	-.0103***
Rent	0.0049***	.0013***
Building Age	-0.0020***	-.0045***
Brand Status	0.1339***	.1659***
Usable Area	0.0204***	.0515**
City Size	0.0989***	.1128**
Brand Status*Year	0.0071	e
Brand Status*Rent	-0.0010***	-.0003**
Brand Status*Building age	-0.0018	e
Brand Status*Usable Area	-0.0391***	e
Brand Status*City Size	-0.0341*	e
Constant	7.7166***	7.5531***

*** $P > |z| = 0.001$
 ** $P > |z| = 0.01$
 * $P > |z| = 0.05$
 e not retained in the course of the model development due to non-significance

Source: Own illustration.

From a real estate perspective, the multilevel analysis findings have three main implications with respect to the objectives of the study. For one thing, real estate practitioners' intuitive perceptions and assumptions of differences in the value of branded and non-branded office properties seem to be justified. The significant positive relationship between 'Brand Status' and 'Value' indicates that a property brand is associated with higher property values in comparison to a non-branded property that is comparable with respect to the year of observation, its age, contract rent, usable area, and the size of its respective macro location. Secondly, this positive relationship seems to be stable across cities, since no significant between-city variance was detected. And finally, the negative significant interaction effect between 'Brand Status' and 'Rent' suggests that, for branded buildings, the relationship between their contract rent and their overall value is reduced in comparison to non-branded properties.

Beyond the original objectives of this study, the multilevel analysis highlighted that there are significant between-city variances in the relationship between properties' value and their contract rent, usable area, and the year of observation. Across the city sample, a

higher rental level was associated with a higher value. However, the extent of this relation depends on the respective city. To the contrary, properties with larger usable areas might even see lower values in some cities, whereas higher values can be expected in other cities. The regression slope variance for the year of observation indicates that property values saw different trends across time depending on the macro location. While values declined in some cities, others realized an upward tendency. Together, these findings draw attention to the macro location as a source of substantial variance in the appraisal of properties while additionally emphasizing the importance of a detailed analysis of the macro location in the course of investment decisions and property valuations.

The study underlies different limitations and drawbacks resulting from the data sample and the methodology that should be taken into account. As a matter of the principles of data collection from secondary sources, information quality in this study depends on the quality and soundness of the original data collector. The IPD database in turn relies on the correctness and completeness of the data provided by its cooperating companies. Looking at the outliers that were identified, erroneous data entries obviously cannot be ruled out. Thus, it is possible that the dataset includes information that is erroneous, but was not identified as an outlier.

Several multivariate outliers were eliminated by the dataset inspection. Using a dummy variable as an identifier for outlying cases, a multiple linear regression suggested that a low market value, an early year of observation, and a high rental level are associated with a higher probability of being an outlier. Consequently, the study results will have a limited transferability to properties that show extreme parameter values in these variables or, specifically, a combination of these characteristics. From a real estate perspective, this might be the case for properties where the contract rent is clearly above market level or substantial incentives were promised to the tenants, resulting in gaps between contract rent and market value. Similarly, study inferences might be limited for cases in which there are discrepancies between the rental situation of a property at the time of data delivery and the last valuation, or in which higher shares of non-office space lead to differences in the relationship between the rental level and market value.

The complete anonymization of the dataset that was required due to data protection standards was an obvious restriction of the analysis. On the one hand, it was not feasible to review the correctness of the data entries in detail and thus further evaluate the primary independent variable 'Brand Status'. On the other hand, no direct conclusions could be drawn at the single asset level. Because of this, an identification of individual properties and an in-depth analysis of respective branding activities could not be realized.

Another point that needs to be considered when interpreting the study results, is the underlying definition of the 'Brand Status'. By applying a broad definition approach, a wide range of properties is covered, whose brandings might differ with respect to their establishment, their strength in the market, and the overall effort and resources invested in their development. For this reason, the study only enables a binary comparison of branded and non-branded properties, but it does not allow for a differentiated evaluation of respective variations in the overall kind and strength of branding activities.

Regarding the selection and number of independent variables, the study mainly relied on factors that are commonly included in standardized valuation methods and for which information was available in the IPD dataset. As a result, not all potential covariates of brand status that might be relevant were covered. Future studies in this field might include explanatory variables at the postcode area level while also containing additional predictors at the city level.

On the highest level, the dataset was comprised of only 20 different cities, potentially leading to smaller standard errors at this level. Interpretations of higher-level random effects should therefore be considered carefully as already discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden.** Thus, the significance levels for the between-city variances that were expected for the variables 'Year', 'Rent', and 'Usable Area' might be overestimated.

Finally, the study underlies a general limitation of regression-based methods: The methodology is appropriate to ascertain relationships, but not to determine underlying causalities. As a consequence, the multilevel analysis alone does not provide evidence about whether the branding of a property leads to a higher value or whether a higher value causes properties to be branded. Nevertheless, from a real estate perspective, the first causal chain seems to be more comprehensible and logic. As outlined in chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**, a property's value is commonly determined on the basis of standardized valuation methods that build upon all relevant building characteristics. Thus, one can assume that these approaches also implicitly account for the property branding. From this point of view, property brands obviously precede the property value that is determined only after the brand is already established. A reversed causality is also imaginable where a property's high value drives an owner's decision to engage in establishing a property brand. However, this causal chain seems less likely, since the decision to establish a brand is commonly part of new developments or refurbishments in the property lifecycle where properties do not exhibit a high value.⁵²⁶

With this in mind, the study findings provide initial empirical support for the relevance of brands in an office property context and generally support decisions to engage in the development of property brands, regardless of the building's economic year of construction, its rental level, its usable area, or the size of its macro location.

⁵²⁶ See ROTTKE/WERNECKE (2008), pp. 211-212; SCHULTE/BRADE (2001), pp. 38-41; ISENHÖFER (1999), p. 48.

4 Study II: Building Brand Equity in an Office Property Context

The second study of this work comprises the development and empirical testing of a brand equity model for office properties. In the first step, the study objectives are described, and the general study procedure is outlined. Subsequently, a basic conceptual framework for the study is developed, and structural equation modeling is introduced as an appropriate analysis method. Afterward, measurement models for the proposed brand equity components are developed, and hypotheses regarding their interrelations are derived and integrated in a structural model. The data basis of the study is outlined, the hypotheses underlying the suggested model are tested, and an Importance-Performance Matrix Analysis is conducted. Finally, the main findings are summarized, and conclusions and limitations are discussed.

4.1 Study Objective and Overall Procedure

The ultimate objective of this study is to gain an understanding of how brand equity is built in an office property context, to identify its main drivers, and to derive initial recommendations for real estate practitioners on how to establish and manage office property brands. For this purpose, the study aims to develop and empirically test a brand equity model on the basis of the considerations on brand equity in a business-to-business context in Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.** while taking into account the academic and practical modeling requirements introduced in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**

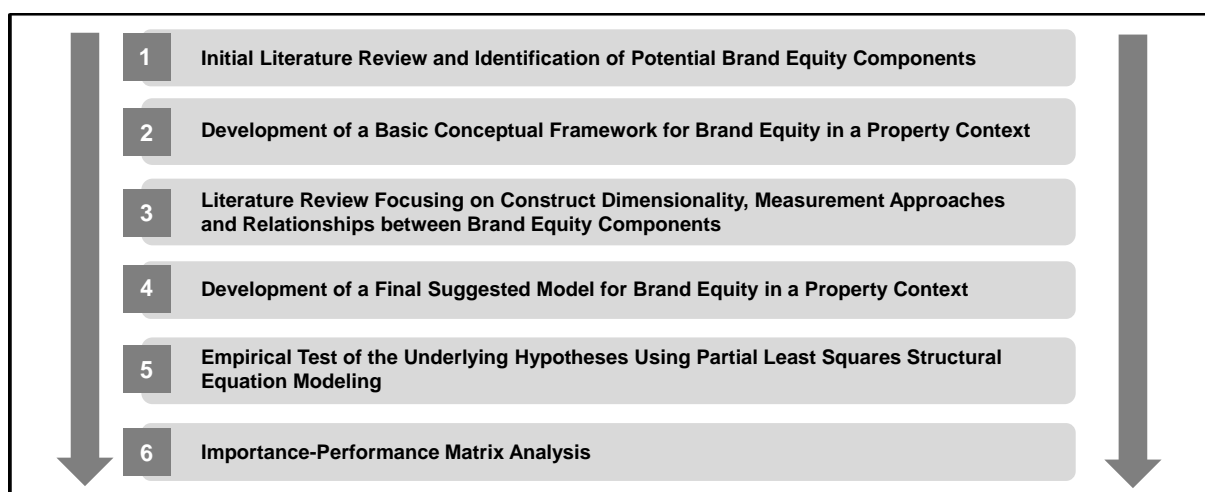
The study procedure followed a stepwise approach to model development based on the systematic procedure for partial least squares structural equation modeling suggested by HAIR et al. (2014) and also corresponding to the general model for structural equation modeling by WEIBER/MÜHLHAUS (2010).⁵²⁷ In the initial step, mainly building upon and extending AAKER's (1991) brand equity framework, potentially relevant components of brand equity were identified on the basis of a literature review covering publications from business-to-business and business-to-customer settings. Their conceptual domain and their general role and nature in a brand equity context were examined, and their importance in an office property context was assessed. From there, a basic conceptual framework for brand equity was developed using LAVIDGE/STEINER's (1961) hierarchy of effects, which was discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, as a general background for the likely relationships between the constructs. Upon this basis, an intensified literature review focused on the dimensionality of the suggested brand equity components and corresponding measurement approaches since it is mainly the domain of the suggested constructs that determines the overall range of applicability of the study

⁵²⁷ See HAIR et al. (2014), p. 25; WEIBER/MÜHLHAUS (2010), p. 32.

results.⁵²⁸ Empirical findings from studies across different business-to-business and business-to-customer settings regarding the relationships between the constructs were examined. Moreover, theories from the field of cognitive psychology were considered in order to enrich the theoretical background of the suggested model. On this basis, measurement models were proposed for each component of brand equity, and hypotheses regarding their relations with each other were derived. Against this background, a final model for brand equity in a property context was proposed.

The empirical study, which was used to test the hypotheses underlying the suggested model, employed a series of questionnaire-based telephone interviews focusing on real estate agency representatives in Germany's top 10 office markets as surrogates for office tenants in the process of a leasing decision.⁵²⁹ The data set was screened for missing values, outliers, and deviations from normal distribution and was subsequently analyzed with the help of variance-based structural equation modeling, which was selected as an appropriate methodology to examine the reflective and formative latent variables and their relationships. Finally, an Importance-Performance Matrix Analysis was conducted in order to illustrate the managerial implications of the suggested model and identify potential areas on which brand managers should focus their efforts to build brand equity for office property brands. Figure summarizes the main steps of the study procedure.

Figure 21: Overall Study Procedure



Source: Own illustration.

4.2 Basic Conceptual Framework for Brand Equity in an Office Property Context

This chapter centers on the identification of potentially relevant components of brand equity in an office property context and the development of an initial conceptual framework. For this purpose, the suggested components and their role and nature in a brand equity

⁵²⁸ See ALBERS/HILDEBRANDT (2006), p. 10.

⁵²⁹ Attempts to identify company representatives engaged in leasing decisions at the time of the study failed due to confidentiality concerns of property owners and real estate agencies. The rationale behind the surrogate approach and corresponding limitations are outlined in more detail in Section **Fehler! Verweisquelle konnte nicht gefunden werden..**

context are explained, and their relevance in an office property setting is discussed. In the second step, a basic hierarchy-of-effects model is applied as a background to establish a general causal sequence between the constructs.

4.2.1 Initial Considerations

The basic conceptual framework proposed for the property brand equity model builds upon AAKER's (1991) brand equity dimensions, which have continuously proven to be a solid basis for studies in business-to-business and business-to-customer settings alike.⁵³⁰ In order to meet the particularities of office properties and leasing decisions, the following adaptations were made: (1) In accordance with the majority of publications in this field, the fifth dimension (other proprietary brand assets) was removed, for it does not comply with a customer-based perspective on brand equity.⁵³¹ (2) Brand trust is included in the model to account for the particular importance of relationships in business-to-business settings and the high level of perceived risk in leasing decisions.⁵³² (3) Similarly, brand familiarity is considered a separate construct to reflect that lower levels of awareness, such as recognition or recall, might not be sensitive enough to capture a brand's salience, since tenants, in an extensive search for information, usually develop acquaintance with several properties.⁵³³

Moreover, it should already be noted at this point that brand awareness, in contrast to the findings of some studies in the business-to-business context (e.g., BIEDENBACH/BENGTSSON/WINCENT (2011), TONG/HAWLEY (2009), RIOS/RIQUELME (2008)), is retained as a relevant factor in the model.⁵³⁴ However, as will be discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, the construct is not considered to be directly related to brand equity in a property context.

In addition, it should be stated that in the course of developing the measurement models in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, the Brand Associations construct is split up into three facets (Accessibility, Valence, and Uniqueness), which are considered as separate constructs in the study. Nonetheless, since the basic conceptual framework developed in this chapter aims to achieve an overview of the model components and their overall sequence, Brand Associations is considered as a single construct for simplification purposes at this point.

⁵³⁰ See CHEN/SU (2012), p. 59; BIEDENBACH/BENGTSSON/WINCENT (2011), p. 1094; CHEN/SU/LIN (2011), p. 1237; KIM/HYUN (2011), p. 429; BIEDENBACH/MARREL (2010), p. 449; GORDON/CALANTONE/DI BENEDETTO (1993), p. 6 for applications in the business-to-business environment.

⁵³¹ See JUNTUNEN/JUNTUNEN/JUGA (2011), p. 303.

⁵³² See Section **Fehler! Verweisquelle konnte nicht gefunden werden.** for a more detailed discussion of the rationale underlying this decision.

⁵³³ The inclusion of brand familiarity in the brand equity model is discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**

⁵³⁴ See BIEDENBACH/BENGTSSON/WINCENT (2011), p. 1094; TONG/HAWLEY (2009), pp. 267-270; RIOS/RIQUELME (2008), p. 732.

4.2.2 Proposed Model Components

The following sections outline the conceptual domain and definition of the suggested constructs and discuss their importance in the context of brand equity in a property context.

4.2.2.1 Brand Awareness

A large majority of studies in the field of brand equity define the concept of brand awareness referring to AAKER's (1991) and KELLER's (1993) definitions. Aaker's definition in particular is frequently cited in later studies.⁵³⁵ The author stated that brand awareness is "(...) the ability for a buyer to recognize or recall that a brand is a member of a certain product category. A link between product class and brand is involved (...)." ⁵³⁶ In a later publication, Aaker pointed out that "Brand awareness reflects the salience of the brand in the customers' mind."⁵³⁷ Similarly, Keller suggested that brand awareness is "(...) the customers' ability to recall and recognize the brand as reflected by their ability to identify the brand under different conditions and to link the brand name, logo, symbol and so forth to certain associations in memory."⁵³⁸ In more psychological terms, the author formulated that the concept "(...) is related to the strength of the brand node or trace in memory, as reflected by consumers' ability to identify the brand under different conditions."⁵³⁹

KELLER (1993) and other authors have highlighted three functions of brand awareness that are the fundament for the construct's crucial role in individuals' decision making. Firstly, brand awareness affects consumer decision making by influencing the formation and strength of brand associations in the brand image. A necessary condition for the creation of a brand image is that a brand node has been established in memory, and the nature of that brand node should affect how easily different kinds of information can become attached to the brand in memory. A hierarchy-of-effects perspective on brand equity also supports this function, since brand awareness is considered to be the basic first step in the task of brand communication and a requirement in order to build brand associations because a brand name must be established in consumers' minds in order to associate brand attributes.⁵⁴⁰ Secondly, brand awareness increases the likelihood that a certain brand is included in customers' consideration set of brands, the group of brands considered in a purchase decision. In this regard, studies also found that higher levels of awareness are associated with a higher purchase intention.⁵⁴¹ Thirdly, in line with the elaboration likelihood model suggested by PETTY/CACIOPPO (1986), which was briefly out-

⁵³⁵ See, for instance, BUIL/MARTINEZ/DE CHERNATONY (2013), p. 63; HYUN/KIM (2011), p. 429; DAVIS/GOLICIC/MARQUARDT (2009), p. 204; PAPPU/QUESTER/COOKSEY (2007), p. 728. CHEN/SU (2012), p. 60 and CHEN/SU/LIN (2011), p. 1235 also refer to Aaker and Keller and further specify their definition, stating that "Brand awareness is the customer's ability to recognize and recall the brand among comparable products in a certain industry under different conditions of complexity and time pressure."

⁵³⁶ AAKER (1991), p. 61.

⁵³⁷ AAKER (1996), p. 114.

⁵³⁸ KELLER (2003), p. 76.

⁵³⁹ KELLER (1993), p. 3.

⁵⁴⁰ See BUIL/MARTINEZ/DE CHERNATONY (2013), p. 63; TONG/HAWLEY (2009), pp. 267-269.

⁵⁴¹ See ESCH et al. (2009), pp. 292-294; BALDAUF/CRAVENS/BINDER (2003), p. 223; NEDUNGADI (1990), pp. 273-276; WOODSIDE/WILSON (1985), pp. 45-48; GRUBER (1969), p. 231.

lined in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, brand awareness can play the role of a decision heuristic in situations where individuals show low levels of involvement due to a lack of motivation (i.e., the judgment object is not of importance to the individual) or ability (i.e., lack of knowledge about the judgment object).⁵⁴² This is particularly the case in the field of fast-moving consumer goods, where a low level of customer involvement can be assumed and purchase decisions are often made directly and relatively spontaneously at the point of purchase.⁵⁴³

In their study on the influence of brand awareness on market performance, HOMBURG/KLARMANN/SCHMITT (2010) identified four moderators that determine the strength of the construct's influence on a brand's overall success in the market. The authors found that the effect of brand awareness is significantly reduced in markets characterized by product heterogeneity and low levels of technological turbulence. Equivalently, low levels of time pressure and high levels of buying-center heterogeneity weaken the effect of the construct.⁵⁴⁴

Considering the particularities of properties and leasing decisions briefly described in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, it must be stated that it seems theoretically questionable that brand awareness functions as a decision heuristic or carries an inherent value for office tenants. Property markets are characterized by a high level of heterogeneity and technological stability, and leasing decisions mostly encompass long-term planning and extensive decision processes in highly diverse buying centers. Consequently, one may doubt whether the construct is a direct antecedent of brand equity.⁵⁴⁵ Nevertheless, brand awareness provides the necessary anchor to which other associations can be attached, and it might be involved in the processing of brand knowledge. For these reasons, the construct is included in the examination of brand equity carried out in this work.

For this purpose, this study also follows Keller's and Aaker's understanding of the construct and applies AAKER's (1991) definition of brand awareness as an individual's ability to recognize or recall that a brand is a member of a certain product category.

4.2.2.2 Brand Familiarity

Academics and practitioners have long recognized the major role of brand familiarity in brand building. In fact, familiarity has proved to play a crucial part in the formation of attitudes and in evaluation and judgment processes in the course of decision making.⁵⁴⁶ Fa-

⁵⁴² See the full work of PETTY/CACIOPPO (1986) for a detailed discussion of the elaboration likelihood model. See also the work of MACDONALD/SHARP (2003), HOYER/BROWN (1990), JACOBY/SZYBILLO/BUSATO-SCHACH (1977), and ROSELIUS (1971) for investigations of brand awareness as a decision heuristic.

⁵⁴³ See MACDONALD/SHARP (2000), pp. 1-11.

⁵⁴⁴ See HOMBURG/KLARMANN/SCHMITT (2010), p. 208.

⁵⁴⁵ As will be discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, there is empirical evidence both in favor of and against a direct influence of brand awareness on brand equity. However, especially in business-to-business settings, the relevance of brand awareness as a dimension of brand equity is often not confirmed.

⁵⁴⁶ See DAWAR/LEI (2009), p. 510.

miliar brands have shown major advantages over unfamiliar brands regarding learning, storage and retrieval and the evaluation of brand-related information.⁵⁴⁷

In the field of brand familiarity research, the definition of the concept as proposed by ALBA/HUTCHINSON (1987) seems to be widely accepted. According to the authors, brand familiarity is "(...) the number of product-related experiences that have been accumulated by the consumer."⁵⁴⁸ This understanding of the construct has been frequently referred to in later publications, for instance, by HA/PERKS (2005), CAMPBELL/KELLER (2003), and BISWAS (1992).⁵⁴⁹ However, building upon this broad understanding of the concept, different perspectives have been developed depending on the focus of the respective research stream.

From an information processing view, KENT/ALLEN (1994) built upon Alba/Hutchinson's definition, schema theory, and the theory of associative network models, stating that brand familiarity mainly refers to the cognitive representations of brand-related experiences stored in memory instead of the prior experiences themselves.⁵⁵⁰ DELGADO-BALLESTER/NAVARRO/SI-CILIA (2012) also referred to Alba/Hutchinson's understanding and pointed out that the construct "(...) captures consumers' brand knowledge structures, being more limited and weaker for unfamiliar brands and stronger and more sophisticated and accessible for familiar ones."⁵⁵¹

An alternative and more concrete view of the construct was applied by BAKER et al. (1986) and PHELPS/THORSON (1991). The authors posited that brand familiarity as a kind of "affective residue" toward a brand is directly related to the amount of time that individuals spend on processing brand-related information, regardless of the content or the type of processing (semantic or sensory).⁵⁵²

The importance of brand familiarity in building brand equity has been emphasized over mere awareness by several authors, such as BONDESSON (2012), PERSSON (2010), HUTTON (1997), and DOWLING/STAE LIN (1994), especially in business-to-business settings. Indeed, organizational buyers must be aware of a company in order to consider it in their purchase decisions. However, awareness alone does not necessarily reduce buyers' perceived risk, since they tend to prefer well-known business partners.⁵⁵³ Especially in high-risk situations, individuals tend to seek more information and depend more heavily on previous experience to prepare for eventual outcomes. In this regard, SEO et al. (2013) stated that familiarity may reduce complexity and uncertainty through understanding.⁵⁵⁴ Similarly, PARK/LESSIG (1981) found that familiarity increases individuals' confidence in their deci-

⁵⁴⁷ See DELGADO-BALLESTER/NAVARRO/SICILIA (2012), pp. 32-33; KENT/ALLEN (1994), p. 103; BISWAS (1992), p. 254; ALBA/HUTCHINSON (1987), p. 411.

⁵⁴⁸ ALBA/HUTCHINSON (1987), p. 411.

⁵⁴⁹ See HA/PERKS (2005), p. 441; CAMPBELL/KELLER (2003) p. 293; BISWAS (1992), p. 253.

⁵⁵⁰ KENT/ALLEN (1994), pp. 98-99.

⁵⁵¹ DELGADO-BALLESTER/NAVARRO/SICILIA (2012), p. 33.

⁵⁵² See PHELPS/THORSON (1991), p. 204; BAKER et al. (1986), pp. 33-34.

⁵⁵³ See BONDESSON (2012), p. 33; PERSSON (2010), p. 1270; HUTTON (1997), pp. 433-434; DOWLING/ STAE LIN (1994), pp. 120-122.

⁵⁵⁴ See SEO et al. (2013), p. 297.

sions.⁵⁵⁵ Moreover, ZIMBARDO/LEIPPE (1991) pointed out that higher levels of acquaintance with an object are generally associated with a stronger tendency to like it.⁵⁵⁶

Together, these findings strongly suggest that brand familiarity has an influence on customers' decision making that goes beyond mere awareness. From a real estate perspective, these arguments might also hold true. Potential tenants are engaged in extensive decision-making processes with the aim of becoming familiar with the different properties on the market. In the same way, existing tenants possess a high level of familiarity with their office building. In both situations, brand familiarity may contribute to building brand equity and might have an influence on the decision to lease or renew a lease contract. Moreover, based on an extensive search for information, potential tenants can achieve a comprehensive overview of the market. In these cases, one can also assume that the sensitivity of brand awareness in terms of recall and recognition is limited regarding a property brand's salience. For these reasons, brand familiarity is included as a separate construct in the overall property brand equity model.⁵⁵⁷

Against this background, and in accordance with the majority of publications in this field, this study follows ALBA/HUTCHINSON'S (1987) definition of brand familiarity as individuals' degree of brand-related knowledge through direct and indirect experiences with the brand. In this way, not only the time individuals have spent processing brand information is reflected but also individuals' knowledge structures.⁵⁵⁸

4.2.2.3 Brand Associations

According to AAKER (1991), brand associations are the category of a brand's assets and liabilities that comprise "anything linked in memory to a brand."⁵⁵⁹ Likewise, based on the associative network model of brand knowledge, KELLER (1993) defined brand image as "perceptions about a brand as reflected by the brand associations held in consumer memory" and points out that "brand associations are the other informational nodes linked to the brand node in memory and contain the meaning of the brand for consumers."⁵⁶⁰

Later approaches frequently build upon Aaker's and Keller's definitions of the brand associations concept. For instance, PERSSON (2010) stated that brand associations cover "any information linked to the brand in consumer memory"⁵⁶¹; Chen (2001) referred to brand associations as "a network of nodes and links where the brand node memory has a variety of associations or simple unique association linked to it"⁵⁶²; and GIL/ANDRÉS/SALINAS

⁵⁵⁵ See PARK/LESSIG (1981), p. 228.

⁵⁵⁶ See ZIMBARDO/LEIPPE (1991), p. 171.

⁵⁵⁷ A similar separate consideration of brand awareness and brand familiarity was applied, for instance, by TAN/HISHAMUDDIN/DEVINAGA (2014) and MING/ISMAIL/RASIAH (2011). A separate examination of the two constructs is also supported by the work of NETEMEYER et al. (2004), p. 214, who apply two indicators differentiating between brand familiarity and brand awareness in their measurement model.

⁵⁵⁸ See also PARK (2009), p. 25 for an equivalent definition building upon ALBA/HUTCHINSON (1987).

⁵⁵⁹ AAKER (1991), p. 109.

⁵⁶⁰ KELLER (1993), p. 3.

⁵⁶¹ PERSSON (2010), p. 1270.

⁵⁶² CHEN (2001), p. 439.

(2007) built upon Aaker's definition of brand associations and stated that "they represent the meaning of the brand for the consumer."^{563,564}

Brand associations can include a range of different memories such as brand-related thoughts, feelings, perceptions, images, experiences, beliefs, and attitudes.⁵⁶⁵ In this regard, it must be stated that brand associations might result not only from controlled marketing activities but from all kinds of experiences and contacts that stakeholders have with a subject brand. If a certain brand's associations differ from the associations of a competitor, differences in customers' brand-specific response are also likely.⁵⁶⁶ In fact, brand associations are commonly considered to represent the basis for preference building, purchase decision making, and loyal behavior.⁵⁶⁷ Numerous studies postulate that brand associations clearly exhibit behavioral relevance, affecting the processing and recall of brand-specific information and influencing the creation of attitudes and feelings.⁵⁶⁸ Thus, altogether, brand associations are frequently considered to be an essential element of brand equity and are also included as a construct in this study.

This study also follows Aaker's and Keller's widely accepted understanding of brand associations, in that brand associations comprise all mental linkages belonging to a certain brand in individuals' memory, thus reflecting a brand's meaning for the individual.

4.2.2.4 Perceived Quality

Perceived quality is frequently referred to as one of the primary facets of the brand equity framework and a valuable means of differentiation and competitive advantage. Across industries and product categories, it is associated with individuals' willingness to pay a price premium and their brand purchase intent, brand extensibility, and brand choice and has been repeatedly emphasized in business-to-business settings.⁵⁶⁹

A majority of contributions focusing on perceived quality apparently build upon the work of ZEITHAML (1988), as well as ZEITHAML/BERRY/PARASURAMAN (1996) and, to a lesser extent, OLSON/JACOBY (1972).⁵⁷⁰ Regarding the overall understanding of the construct in the field of brand equity, however, the definitions suggested by ZEITHAML (1988) and AAKER (1991) seem to have gained wide acceptance.⁵⁷¹

⁵⁶³ GIL/Andrés/SALINAS (2007), p. 189.

⁵⁶⁴ For similar applications and direct references to Aaker's and Keller's understanding of the brand associations construct, see, for instance, BUIL/MARTINEZ/DE CHERNATONY (2013), HYUN/KIM (2011), OAKENFULL/MCCARTHY (2010), TONG/HAWLEY (2009), and LOW/LAMB (2000).

⁵⁶⁵ See KOTLER/KELLER (2006), p. 188.

⁵⁶⁶ See MÖLL (2007), p. 35.

⁵⁶⁷ See AAKER (1991), pp. 109-110, 272.

⁵⁶⁸ See, for instance, the work of KATHURIA/JIT (2009), ESCH/GEUS/LANGNER (2002), CHEN (2001), and DEL RÍO/VÁZQUEZ/IGLESIAS (2001).

⁵⁶⁹ See KEMP/CHILDERS/WILLIAMS (2012), p. 510; BIEDENBACH/BENGTSSON/WINCENT (2011), p. 1095; TONG/HAWLEY (2009), p. 9; VAN RIEL/DE MORTANGES/STREUKENS (2005) p. 842; BALDAUF/CRAVENS/BINDER (2003), p. 223; AAKER (1996), p. 109.

⁵⁷⁰ See ANSELMSSON/JOHANSSON/PERSSON (2007), p. 403.

⁵⁷¹ For applications of ZEITHAML's (1988) definition, see, for instance, YOO/DONTHU (2001), p. 3; HYUN/KIM (2011), p. 430; GIL/ANDRÉS/SALINAS (2007), p. 189. AAKER's (1991) definition is applied by, for example, KEMP/CHILDERS/WILLIAMS (2012), p. 510; BIEDENBACH/BENGTSSON/WINCENT (2011), p. 1095; PAPPU/QUESTER/COOKSEY (2007), p. 728.

According to ZEITHAML (1988), perceived quality is “the consumer’s judgment about a product’s overall excellence or superiority.”⁵⁷² Similarly, AAKER (1991) suggested that perceived quality is “the customer’s perception of the overall quality or superiority of a product or service with respect to its intended purpose, relative to alternatives.”⁵⁷³ Obviously, both approaches show a large overlap; however, Aaker’s definition puts even more focus on the fact that quality perceptions are built upon comparisons with a frame of reference.

Following the underlying common understanding of perceived quality, the construct clearly differs from an objective evaluation of a product or service as it is more related to an attitudinal assessment of a brand in the sense of a global affective assessment of a brand’s performance in comparison to other brands that results from individuals’ direct and indirect experiences.⁵⁷⁴

In this respect, BENDIXEN/BUKASA/ABRATT (2004) stated that perceived quality is in close conceptual proximity to the brand associations construct.⁵⁷⁵ In fact, the construct is also implicitly reflected in KELLER’s (1993) conceptualization of brand associations, which differentiates between attributes, benefits, and attitudes. While the lowest level of abstraction is related to more objective quality attributes of a brand (e.g., “The property has a marble floor”), the middle level refers to the perceived advantages (e.g., “High durability, little maintenance, prestigious”), and the highest level – obviously most closely related to subjective quality perceptions – denotes individuals’ overall evaluation (e.g., “Liking the property”). More formally, Keller stated that “(...) brand attitudes are a function of the associated attributes and benefits that are salient for the brand.”⁵⁷⁶ In fact, some authors have proposed including perceived quality in the overall set of brand associations.⁵⁷⁷ Yet the majority have suggested considering this construct as a self-contained dimension of brand equity due to its importance in a brand equity context.⁵⁷⁸ In this regard, Aaker’s approach to conceptualizing brand equity seems to dominate research in this field.

From the perspective of cognitive psychology, the means-end chain model, which also underpins KELLER’s (1993) brand association categories, may offer an appropriate framework to explain how individuals form their subjective quality judgments.⁵⁷⁹ As pointed out in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, the means-end chain approach suggests that brand-related information is organized at different levels of abstraction in individuals’ memory, ranging from simple attributes (e.g., physical characteristics) through functional and practical benefits to complex personal values (e.g., the value or payoff of the product to the individual).⁵⁸⁰

⁵⁷² ZEITHAML (1988), p. 3.

⁵⁷³ AAKER, 1991, p. 85.

⁵⁷⁴ See GIL/ANDRÉS/SALINAS (2007), p. 189; ZEITHAML (1988), pp. 3-4.

⁵⁷⁵ See BENDIXEN/BUKASA/ABRATT (2004), p. 378.

⁵⁷⁶ See KELLER (1993), p. 4.

⁵⁷⁷ See the work of KELLER/APÉRIA/GEORGSON (2008) or GORDON/CALANTONE/DI BENEDETTO (1994) as exemplary writings following this approach.

⁵⁷⁸ In this regard, BENDIXEN/BUKASA/ABRATT (2004), p. 378 stated that perceived quality is consistently “mentioned as the important criterion. That is certainly one of the reasons why it is a brand association that has been elevated to the status of a brand asset (...).”

⁵⁷⁹ See NETEMEYER et al. (2004), pp. 210-211.

⁵⁸⁰ See ZEITHAML (1988), p. 5.

Perceived quality has continuously been considered to be an important dimension of brand equity and has been especially emphasized in business-to-business environments.⁵⁸¹ In this regard, tangible and intangible attributes of a product are the main drivers of perceived quality and are regarded as a major source of competitive advantage due to their crucial role in individuals' decision making.⁵⁸² In a property-related study setting, ROBERTS/MERRILEES (2007) also identified perception of service quality in a shopping center as a major reason for tenants to renew their contract with the center management.⁵⁸³ Consequently, it seems reasonable to include perceived quality as a construct in the property brand equity model.

Against this background, this study follows the dominant stream of research and applies the definitions suggested by AAKER (1991) and ZEITHAML (1988), viewing perceived quality as the individual's judgment of the overall excellence, esteem, or superiority of a brand with respect to its intended purposes relative to alternative brands in the reference frame.⁵⁸⁴ In line with the majority of publications in this field, the construct is considered as an individual dimension of brand equity and is not included in the brand associations construct.

4.2.2.5 Brand Trust

The concept of trust has received a great deal of attention across multiple disciplines such as psychology, sociology, and economics and has increasingly been investigated in the application-oriented field of management and marketing.⁵⁸⁵ In social sciences, trust has been used to describe mutual relationships over time between a trustor (who places trust) and a trustee (who is trusted). Trust has an influence on the trustor's perception of benefits and risks in the interaction with the trustee and occurs when there is no empirical way for the trustor to check the intention of the trustee.⁵⁸⁶ Therefore, trust has proven to be the affect-based cornerstone of close relationships.⁵⁸⁷

Although there seems to be a general agreement on the overall role of trust, the multidisciplinary interest in the trust concept has resulted in an increasing number of nuanced perspectives and definitions of the concept. In an exchange-related context, SCHURR/OZANNE (1985) defined trust as "(...) the belief that a party's word or promise is reliable and a party will fulfill his/her obligations in an exchange relationship."⁵⁸⁸ Similarly, applying a relationship-oriented perspective, ANDERSON/WEITZ (1989) suggested that trust refers to "(...) one party's belief that its needs will be fulfilled in the future by actions un-

⁵⁸¹ See, for instance, BIEDENBACH/BENGTSSON/WINCENT (2011), p. 1094; BIEDENBACH/MARELL (2010), pp. 448-449; VAN RIEL/DE MORTANGES/STREUKENS (2005), p. 842; BALDAUF/CRAVENS/BINDER (2003), p. 223.

⁵⁸² See CHEN/SU (2012), p. 60; CHEN/SU/LIN (2011), p. 1235.

⁵⁸³ See ROBERTS/MERRILEES (2007), p. 413.

⁵⁸⁴ See NETEMEYER et al. (2004), p. 210 for a largely identical application of Aaker's and Zeithaml's definition.

⁵⁸⁵ See DELGADO-BALLESTER/MUNUERA-ALEMAN (2005), p. 188.

⁵⁸⁶ See HSU/CAI (2009), p. 4.

⁵⁸⁷ See ESCH et al. (2006), p. 100.

⁵⁸⁸ SCHURR/OZANNE (1985), p. 940. This definition was also applied by, for instance, RAMESHAN/RABBANEE/HUI (2013), p. 336 in a business-to-business brand equity setting.

dertaken by the other party.”⁵⁸⁹ More concretely, MORGAN/HUNT (1994) specified that trust exists “(...) when one party has confidence in an exchange partner’s reliability and integrity.”⁵⁹⁰

Following the assumption that a brand can act as a substitute for a personal interaction between a company and its customers, CHAUDHURI/HOLBROOK (2001) defined brand trust as the average consumer’s “(...) willingness to rely on the ability of the brand to perform its stated function.”⁵⁹¹ This definition has found some acceptance in later publications, such as the work of GEÇTİ/ZENGİN (2013), HUBER/MEYER/WEIßHAAR (2013), and ESCH et al. (2006).⁵⁹² The understanding of the concept puts emphasis on the importance of trust in situations characterized by high levels of perceived risk, where customers’ trust in a brand can reduce perceptions of insecurity and vulnerability. With an even stronger focus on the confidence and risk aspect, DELGADO-BALLESTER/MUNUERA-ALEMAN (2005) defined brand trust as “the confident expectations of the brand’s reliability and intentions in situations entailing risk to the consumer.”⁵⁹³ Similarly, widening the focus from brands to products and services, HERBST et al. (2012) referred to brand trust as consumers’ confidence that the brand, product, or service firm is dependable and competent.⁵⁹⁴ On balance, the variety of definitions clearly has a common core in that the trustor, in the face of risk, has confidence in the motives and actions of the trustee.

According to MORGAN/HUNT’s (1994) widely accepted commitment and trust theory, trust and commitment must exist for successful relationships. When both are present, they ultimately drive productivity, efficiency, and effectiveness in relationships between exchange partners. Relying on exchange theory and the principle of generalized reciprocity, the authors further suggest that trust influences commitment, since parties will seek to commit only to trustworthy partners. Therefore, trust is the fundamental condition of every relationship and, in turn, builds upon communication and shared values but is reduced by opportunistic behaviors.⁵⁹⁵ In this regard, DONEY/BARRY/ABRATT (2007) noted that the trustor must be vulnerable and the outcomes of the interaction must be uncertain to some extent for trust to be established.⁵⁹⁶ Equivalently, SICHTMANN (2007) pointed out that trust is an effective way to reduce customers’ uncertainty.⁵⁹⁷ This argument is also supported by ELLIOTT/YANNOPOULOU (2007), who stated that in purchase situations of high perceived risk, trust becomes necessary as a result of emotional rather than cognitive judgments. With repetition over time, judgments become more stable and risk perceptions are reduced. However, the authors noted that trust is unstable by nature and established expectations that have been developed over time might collapse at the first disappointment.⁵⁹⁸

⁵⁸⁹ ANDERSON/WEITZ (1989), p. 312.

⁵⁹⁰ MORGAN/HUNT (1994), pp. 23-24.

⁵⁹¹ CHAUDHURI/HOLBROOK (2001), p. 82.

⁵⁹² See ESCH et al. (2006), p. 133; GEÇTİ/ZENGİN (2013), p. 112; HUBER/MEYER/WEIßHAAR (2013), p. 33.

⁵⁹³ DELGADO-BALLESTER/MUNUERA-ALEMAN (2005), p. 188.

⁵⁹⁴ See HERBST et al. (2012), p. 910.

⁵⁹⁵ See MORGAN/HUNT (1994), pp. 22-24.

⁵⁹⁶ See DONEY/BARRY/ABRATT (2007), p. 1099.

⁵⁹⁷ See SICHTMANN (2007), p. 1000.

⁵⁹⁸ See ELLIOTT/YANNOPOULOU (2007), p. 989.

Despite its growing importance across several fields of research, the concept has long been disregarded in a brand equity context. AAKER (1996) considered trust to be one of many characteristics of organizational associations, thus de-emphasizing its importance.⁵⁹⁹ Similarly, KELLER's (2008, 1993) brand equity concept implicitly includes brand trust as one of many brand associations, and the construct is also reflected as a part of brand feelings within the customer-based brand equity pyramid.⁶⁰⁰ On this basis, trust has been frequently considered as a part of the brand associations construct in several later publications across different industry settings.⁶⁰¹

However, from the perspective of relationship marketing, which refers to all activities intended to establish, develop, and maintain exchange relationships with clients, the concept of trust has been increasingly supported as one of the key mediating variables in all relational exchanges.⁶⁰² As HISCOCK (2001) stated: "The ultimate goal of marketing is to generate an intense bond between the consumer and the brand, and the main ingredient of this bond is trust."⁶⁰³ Against this background, following a resource-based view, DELGADO-BALLESTER/MUNUERA-ALEMÁN (2005) discussed brand equity as an intangible relational asset of a company and strongly emphasized the importance of trust in this context.⁶⁰⁴ Similarly, SCHUILING/KAPFERER (2004) posited that trust is a key brand equity element, since "(...) brands exist because of the trust they convey to consumers."⁶⁰⁵ According to ELLIOTT/YANNOPOULOU (2007), trust evolves out of customers' experiences with a brand, which constitutes a base of brand-related associations. From there, trust may develop in a hierarchy of emotional involvement. Consequently, trust requires a move from reliance on rational cognitions toward reliance on emotion, creating a notion of intimacy between customers and a brand.⁶⁰⁶

The role of trust as a significant aspect of business relationships is especially highlighted in the business-to-business context.⁶⁰⁷ Here, trust refers mainly to the direct personal relationship between the exchange parties, whereas in business-to-consumer settings, trust may be developed toward a brand as a substitute for direct human contact between a company and its customers.⁶⁰⁸

Looking at a business-to-business context, MOUZAS/HENNEBERG/NAUDÉ (2007) differentiated between interpersonal trust and interorganizational trust. The authors stated that the concept of affect-based trust is generally more applicable to interpersonal relationships than relationships between companies, since it is individuals as members of organizations, rather than the organizations themselves, who trust. Moreover, long-term business relationships can also exist in the absence of trust, as they can be characterized by col-

⁵⁹⁹ See AAKER (1996), p. 113.

⁶⁰⁰ See KELLER/APÉRIA/GEORGSON (2008), p. 57; KELLER (1993), pp. 3-6.

⁶⁰¹ See, for instance, the work of BUIL/DE CHERNATONY/MARTÍNEZ (2013), p. 120; Bondesson (2012), p. 34; TONG/HAWLEY (2009), p. 16; PAPPU/QUESTER/COOKSEY (2007), p. 741.

⁶⁰² See CHAUDHURI/HOLBROOK (2001), p. 90; BENNETT, R./RUNDLE-THIELE, S. (2000), pp. 97-101.

⁶⁰³ See HISCOCK (2001), p. 32.

⁶⁰⁴ See DELGADO-BALLESTER/MUNUERA-ALEMÁN (2005), p. 188.

⁶⁰⁵ See SCHUILING/KAPFERER (2004), p. 105.

⁶⁰⁶ See ELLIOTT/YANNOPOULOU (2007), pp. 990-991.

⁶⁰⁷ See RAMASESHAN/RABBANEE/HUI (2013), p. 338; MOUZAS/HENNEBERG/NAUDÉ (2007), p. 1016; RAUYRUEN/MILLER/GROTH (2007), p. 177.

⁶⁰⁸ See LAU/LEE (1999), pp. 343-344.

laboration and interdependence based on mutual interest and risk assessment. Therefore, trust in a company's employees may also exist independently from trust in the company that they represent.⁶⁰⁹ However, as RAMASESHAN/RABBANEE/HUI (2013) have argued, trust among the employees of different organizations can induce interorganizational trust as well.⁶¹⁰

From a real estate perspective, the concept of trust is of high importance in the context of leasing decisions and leasing relationships. As described in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, in an early phase, the relationship between (potential) occupiers and the owners of an office property may develop especially on the basis of site visits and personal contact over the time of the leasing-decision process. In this respect, GERSTNER (2008) pointed out that tenancy relationships contain both a legal and a social component. The leasing decision itself is frequently considered a high-involvement setting characterized by a significant level of personal and organizational risk.⁶¹¹ With respect to existing tenancies, PFNÜR/LOHSE (2008) highlighted successful relationship management as a cornerstone of tenant retention.⁶¹² The tenant company will usually be bound to the property for several years and will rely on the ability of the property and, ultimately, the people behind the property to provide the required functionalities for its core business. Disturbances such as substantial maintenance lags, unfavorable changes of the environment, or changes in the ownership of the property might easily endanger tenants' business. Even if contractual agreements may reduce those risks, not all eventualities might be covered, and the efforts to enforce one's right may consume resources. Moreover, on a personal level, participants in the leasing-decision process may be held responsible for negative outcomes of the tenancy. Altogether, it can be stated that tenants' trust in the property brand and, ultimately, in the people behind the brand, who are responsible for the management of the building, is a cornerstone of a flawless leasing process and a fundamental aspect of a long-term efficient, effective, and productive tenant-owner relationship. For these reasons, and in line with the general emphasis on brand trust in a business-to-business context, brand trust is proposed as a separate construct in the brand equity model for office properties.

With that said, this study follows CHAUDHURI/HOLBROOK'S (2001) definition of brand trust as the "(...) willingness to rely on the ability of the brand to perform its stated function."⁶¹³ The definition has already been applied in brand-related studies, and the risk aspect of leasing situations, as well as tenants' reliance on the long-term performance of the property brand and thus the people behind it, is appropriately reflected.

4.2.2.6 Brand Loyalty

Customer's loyalty toward a brand has been widely recognized as being related to a range of favorable responses toward a brand, which are closely associated with brand equity. Loyal customers tend to pay less attention to the advertisements of competing brands, are

⁶⁰⁹ See MOUZAS/HENNEBERG/NAUDÉ (2007), p. 1017-1024.

⁶¹⁰ See RAMASESHAN/RABBANEE/HUI (2013), p. 336.

⁶¹¹ See GERSTNER (2008), pp. 114-118.

⁶¹² See PFNÜR/LOHSE (2008), pp. 52-53.

⁶¹³ See CHAUDHURI/HOLBROOK (2001), p. 82.

less price sensitive, and engage in positive word of mouth, leading to reduced marketing costs and higher profitability.⁶¹⁴ Especially in a business-to-business context, brand loyalty is emphasized as a driver of companies' profitability and a main aspect of brand equity, since the number of potential customers tends to be limited and the retention of valuable business partners is of major importance.⁶¹⁵

Both AAKER (1991) and KELLER (1993) incorporated brand loyalty in their considerations on brand equity, though from a slightly different point of view. According to Aaker, brand loyalty is a primary dimension of brand equity that builds on past consumption and usage experiences. Conversely, Keller has argued that brand loyalty is a consequence of brand equity, since favorable attitudes toward a brand may lead to repeated purchasing behaviors.⁶¹⁶

Two distinct perspectives concentrating on different aspects of the phenomenon have found their way into the research literature: a behavioral view and an attitudinal view.⁶¹⁷ While attitudinal brand loyalty relates mainly to customers' brand-specific preferences, dispositions, and their psychological commitment to repurchase and recommend the brand, behavioral brand loyalty refers to the actual action of repurchasing or recommending.⁶¹⁸ From an attitudinal view, brand loyalty builds upon individuals' positive bond and commitment to a brand, which in turn arises from the coincidence between customers' preferences and the brand's attributes. By contrast, from a behavioral perspective, brand loyalty stems from individuals' prior purchases, which lead to a certain purchasing habit.⁶¹⁹

In an industrial buying context, the attitudinal facet of brand loyalty has been emphasized over a mere behavioral understanding. For instance, RAMASESHAN/RABBANEE/HUI (2013) have argued that loyalty is less likely to be derived from routine or habit, since extensive decision-making processes are employed. Rather, references based on positive word of mouth and customer retention arising from a positive attachment to a brand play a crucial role.⁶²⁰

According to the prevalent multidimensional understanding of the construct, attitudinal and behavioral facets are interrelated; attitudinal brand loyalty is usually considered to be the

⁶¹⁴ See RAMASESHAN/RABBANEE/HUI (2013), pp. 336-337; DELGADO-BALLESTER/MUNUERA-ALEMÁN (2005), p. 189.

⁶¹⁵ See BIEDENBACH/BENGTTSSON/WINCENT (2011), p. 1095; BIEDENBACH/MARELL (2010), pp. 448-449.

⁶¹⁶ See AAKER (1991), pp. 34-55; KELLER (1993), p. 8.

⁶¹⁷ Besides behavioral and attitudinal loyalty, GREMLER/BROWN (1996), p. 173 suggested cognitive loyalty as a third stage of brand loyalty. Cognitive loyalty exists when a brand is customers' first choice in buying decisions, which is closely linked to top-of-mind as the highest level of brand awareness. However, this additional stage is not widespread in recent conceptualizations of brand loyalty. Similarly, WOTHINGTON/RUSSEL-BENETT/HÄRTEL (2010) proposed a tridimensional approach covering cognitive, affective, and behavioral loyalty. In an earlier publication, SHETH/PARK (1974), p. 451 also suggested three dimensions of brand loyalty: (1) emotive tendency toward the brand associated with customers' affective attitude, (2) evaluative tendency towards the brand based on utility assessments, and (3) behavioral tendency towards the brand, referring to a positively biased way of behaving toward the brand. However, in more recent publications, a two-dimensional understanding of the construct seems to dominate research in this field.

⁶¹⁸ See RUSSEL-BENNETT/MCCOLL-KENNEDY/COOTE (2007), pp. 1253-1255.

⁶¹⁹ See GIL/ANDRÉS/SALINAS (2007), p. 189.

⁶²⁰ See RAMASESHAN/RABBANEE/HUI (2013), p. 337.

cognitive component of brand loyalty that usually precedes the conative component of behavioral loyalty. The assumption of a relation between attitudinal and behavioral loyalty facets is also supported from the perspective of cognitive psychology and attitude-behavior theories. In this respect, SHETH/PARK (1974) stated that brand loyalty not only represents a systematic biased response toward a brand but implies that customers also have a consistent cognitive structure underlying their biased behaviors. Consequently, one can conclude that brand loyalty is based on the brand-related associative network in consumers' minds.⁶²¹

In this regard, true loyalty must be distinguished from mere purchasing habits because true loyalty always demands a state of conviction.⁶²² A customer might continually purchase a brand without a strong commitment and preference for it. For instance, KELLER/APÉRIA/GEORGSON (2008) have argued that price discounts or a superior stocking of products possibly lead to more frequent purchases even though target groups' actual attachment to a brand remains low. When confronted with a competing brand that offers reasons to switch, there is no intrinsic bond to prevent customers from doing so.⁶²³

In accordance with these considerations, JACOBY (1971) proposed a definition of brand loyalty describing the phenomenon as the biased behavioral response toward a brand expressed over time as a function of psychological processes.⁶²⁴

With a stronger focus on the attitudinal component of brand loyalty, CHAUDHURI/HOLBROOK (2001) and LOBSCHAT et al. (2013) proposed that brand loyalty refers to a customer's "(...) degree of dispositional commitment in terms of some unique value associated with the brand."⁶²⁵ Similarly, AAKER (1991) defined brand loyalty as "(...) the attachment that a customer has to a brand." Thus, the author refers to attitudinal loyalty as mainly some kind of positive emotional connection or devotion to the brand.⁶²⁶

Balancing between both perspectives, OLIVER (1999) suggested defining brand loyalty as a "(...) deeply held commitment to rebuy or re-patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same-brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior."⁶²⁷ Thus, the approach accentuates the multidimensional nature of brand loyalty and implicitly comprises its attitudinal and behavioral facet. Consequently, Oliver's definition has been frequently referred to across different study settings by later authors such as RAMASESHAN/RABBANEE/HUI (2013), CHEN/SU (2012), HAMEED (2012), HYUN/KIM (2011), CHEN/SU/LIN (2010), ANSELMSSON/JOHANSSON/PERSSON (2007), GIL/ANDRÉS/SALINAS (2007), and BALDAUF/CRAVENS/BINDER (2003).⁶²⁸

⁶²¹ See SHETH/PARK (1974), p. 451.

⁶²² See GEÇTI/ZENGİN (2013), p. 113; HELM/LANDSCHULZE (2013), p. 32; BANDYOPADHYAY/MARTELL (2007), pp. 40-43.

⁶²³ See KELLER/APÉRIA/GEORGSON (2008), p. 82.

⁶²⁴ See JACOBY (1971), p. 26.

⁶²⁵ See LOBSCHAT et al. (2013), p. 132; CHAUDHURI/HOLBROOK, (2001), p. 82.

⁶²⁶ See AAKER (1991), p. 39.

⁶²⁷ See OLIVER (1999), p. 34.

⁶²⁸ See RAMASESHAN/RABBANEE/HUI (2013), pp. 336-337; CHEN/SU (2012), p. 61; HAMEED (2013), p. 182; HYUN/KIM (2011), p. 430; CHEN/SU/LIN (2010), p. 1234; ANSELMSSON/JOHANS-

From a real estate perspective, brand loyalty can also be assumed to be a major determinant of an office property's performance. Especially in market cycles where space supply exceeds demand, the move of a major tenant can easily endanger the overall profitability of a building. In this regard, APPEL-MEULENBROEK (2008) pointed out that changes in the tenant structure and vacancies result in major costs for the owner, related to a reduction in income, marketing activities, first-month incentives, refurbishments, and higher operating expenses caused by potential new tenants that are unfamiliar with procedures and services. By contrast, high levels of tenant loyalty may contribute to favorable behaviors such as positive word of mouth, result in cost savings, and ultimately enhance a property's overall economic success.⁶²⁹ Consequently, it seems reasonable to include brand loyalty as a potential component of a property's brand equity.

Regarding the selection of an appropriate brand loyalty perspective for this study, RUNDLE-THIELE/BENNETT (2001) recommended accounting for the specifics of the product category under investigation.⁶³⁰ In this respect, CHAUDHURI/HOLBROOK (2001) suggested that applying an attitude-focused perspective of brand loyalty seems more suitable when investigating underlying reasons and causalities of the brand equity construct.⁶³¹ This conviction is also supported by PAPPU/QUESTER/COOKSEY (2005) and YOO/DONTHU (2001), who postulated that repeated purchase is a necessary but not sufficient condition for brand loyalty in attitudinal terms.⁶³² Similarly, BANDYOPADHYAY/MARTELL (2007) stated that focusing on the attitudinal facet of brand loyalty seems advisable for durable goods for which the purchasing frequency is low and customers do not frequently switch between brands.⁶³³ This argument is also supported by SHETH/PARK (1974), who stated that a behavioral view of brand loyalty is inappropriate for unique buying decisions and high-involvement situations, which is "(...) especially true, for example, in the case of once-in-a-lifetime consumer decisions for housing and mobility behaviors."⁶³⁴

Taking into account these considerations, an attitudinal perspective of brand loyalty seems reasonable in an office property context. For one thing, leasing decisions are characterized by a high level of involvement and extensive decision processes and do not occur routinely in most companies.⁶³⁵ For another, tenants might be bound to a property on the basis of their contract and not by their emotive tendency toward the brand. Moreover, this study centers on the underlying reasons and causalities of the brand equity construct, applying mainly a perception-oriented view. Against this background, this work acknowledges the multidimensional nature of brand loyalty comprising attitudinal and behavioral facets. However, focusing on attitudinal aspects of the construct, and, similar to CHAUDHURI/HOLBROOK (2001) and LOBSCHAT et al. (2013), particularly on individuals' commitment to the brand, seems more appropriate from a real estate perspective. Conse-

SON/PERSSON (2007), p. 403; GIL/ANDRÉS/SALINAS (2007), p. 189; BALDAUF/CRAVENS/BINDER (2003), p. 223.

⁶²⁹ See APPEL-MEULENBROEK (2008), pp. 43-44.

⁶³⁰ See QUESTER/LIM (2003), pp. 32-35; RUNDLE-THIELE/BENNETT (2001), pp. 31-32.

⁶³¹ See CHAUDHURI/HOLBROOK (2001), p. 82.

⁶³² See PAPPU/QUESTER/COOKSEY (2005), p. 145; YOO/DONTHU (2001), p. 3.

⁶³³ See BANDYOPADHYAY/MARTELL (2007), p. 38.

⁶³⁴ See SHETH/PARK (1974), p. 450.

⁶³⁵ See Section 2.2.1.3 for a more detailed discussion of leasing decisions.

quently, AAKER's (1991) definition of brand loyalty, which emphasizes customers' intrinsic bond with a brand as the source of loyal behavior, is applied in the following.

4.2.2.7 Overall Brand Equity

Consistent with other publications (e.g., BUIL/MARTINEZ/DE CHERNATONY (2013), RIOS/RIQUELME (2008), FAIRCLOTH (2005), GIL/ANDRÉS/SALINAS (2007), YOO/DONTHU (2001), YOO/DONTHU/LEE (2000), TONG/HAWLEY (2009), WASHBURN/PLANK (2002)), this study includes Overall Brand Equity as a separate endogenous construct. In this way, the individual effects of the suggested brand equity components can be determined in order to understand how they contribute to brand equity.⁶³⁶ Moreover, in line with the model requirements described in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, this step contributes to ensure each dimension's relevance regarding tenants' overall attitude toward a property brand, which can be considered an antecedent of brand-related behaviors. The concept and customer-based understanding of brand equity that underlie the construct of Overall Brand Equity were already discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**

4.2.3 Proposed Causal Sequence of the Brand Equity Components

Regarding the suggested components of property brand equity, it is widely accepted that brand equity dimensions are not independent from each other. In order to establish a basic chain of effects between the brand equity elements, numerous publications in business-to-business and business-to-customer settings refer to hierarchy-of-effects models as a theoretical foundation to subsequently develop more detailed hypotheses based on empirical findings from previous studies and theoretical considerations.⁶³⁷

This study also follows this approach and applies LAVIDGE/STEINER's (1961) hierarchy-of-effects model as an underlying fundament. Despite the general points of critique toward hierarchy-of-effects models that were discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, the model is considered to be appropriate for the purpose of this work for four reasons that are in line with BARRY's (2002, 1987) arguments:⁶³⁸ (1) the model provides an intuitive and simple approach to how brand equity is built, (2) the model allows recommendations to be derived on which steps marketers should focus on in order to strengthen a property brand, (3) the model has been frequently applied by other authors to substantiate hypotheses on the relations between brand equity components, and (4) the model is in line with the traditional cognitive-affective-behavioral model, which has also been used repeatedly in earlier publications as a fundamental framework to explain the sequence of brand equity components.⁶³⁹

⁶³⁶ See BUIL/MARTINEZ/DE CHERNATONY (2013), p. 64; GIL/ANDRÉS/SALINAS (2007), p. 193.

⁶³⁷ See, for instance, KIM/HYUN (2011), pp. 427-429; BIEDENBACH/MARELL (2010) pp. 448-449; RIOS/RIQUELME (2008), p. 219; GIL/ANDRÉS/SALINAS (2007), p. 191; CHIOU/DROGE/HANVANICH (2002), pp. 114-116; COBB-WALGREN/RUBLE/DONTHU (1995), pp. 28-29; GORDON/CALANTONE/DI BENEDETTO (1993), p. 5.

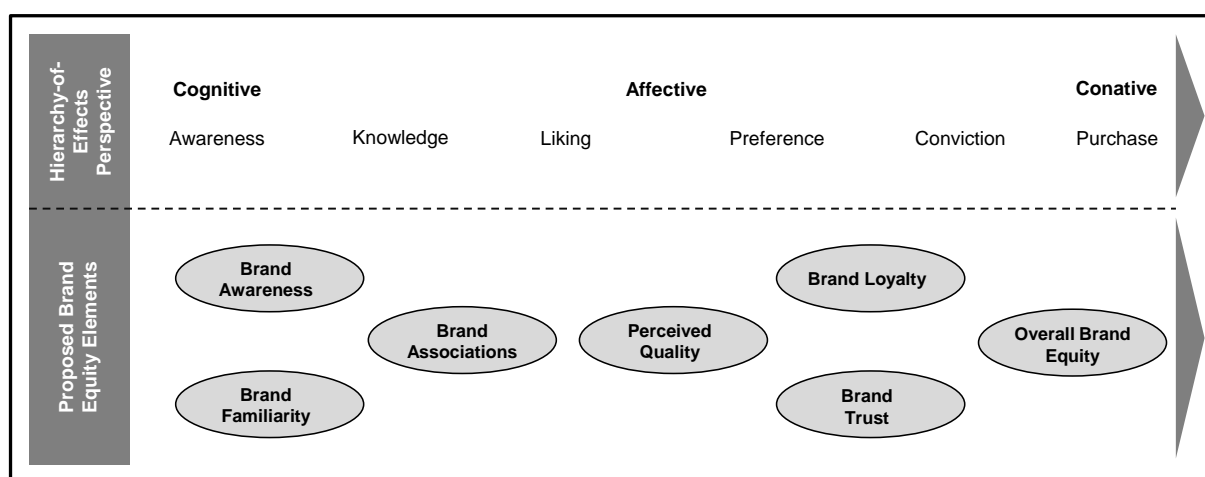
⁶³⁸ See BARRY (2002), p. 46-47; BARRY (1987), pp. 285-286.

⁶³⁹ See, for instance, GIL/ANDRÉS/SALINAS (2007), p. 191; CHIOU/DROGE/HANVANICH (2002), pp. 114-116.

Against the background of LAVIDGE/STEINER's (1961) model, property brand equity is built in a sequence of different steps from cognitive through affective to conative states. Firstly, one can assume that potential office tenants must initially become aware of a property brand through direct and indirect experiences that relate to the development of brand familiarity and brand awareness. With an increasing level of knowledge, their brand-related association network evolves, resulting in a corresponding attitude toward the brand. On this basis, tenants might develop a preference for one property brand over others, a preference that is also built upon the brand's perceived quality compared to alternative options. From there, they may have growing levels of trust in the brand and the people behind it and establish an intrinsic bond with the brand, which can result in an initial decision to lease. For existing office tenants, one can assume that they already have passed through the stages of building brand equity, and their decision to renew a lease contract builds upon their current state. Figure illustrates the flow of the proposed brand equity components against the hierarchy of effects.

Indeed, the proposed constructs are not completely congruent with Lavidge/Steiner's hierarchical stages, and an unambiguous matching is not possible. For instance, one may ask whether brand loyalty in terms of a personal attachment to the brand relates more closely to preference or conviction. However, the framework provides a practicable overview of the general flow of the brand equity components, which will be substantiated through the development of more detailed hypotheses in chapter **Fehler! Verweisquelle konnte nicht gefunden werden..**

Figure 22: Basic Conceptual Framework for the Proposed Property Brand Equity Model



Source: Own illustration.

The suggested perspective on how property brand equity is built is also supported by KELLER's (2001) brand equity pyramid.⁶⁴⁰ In the first step, brand salience, which relates to brand awareness and brand familiarity, must be created with potential tenants. From there, they form perceptions of quality and accumulate brand-related associations on the basis of direct and indirect experiences with a property. On this basis, tenants develop

⁶⁴⁰ See KELLER (2001b), p. 17. See also KIM/HYUN (2011), p. 431, who supported the notion that KELLER's (2001b) brand equity model is in line with the propositions of LAVIDGE/STEINER's (1961) framework.

their individual judgments and feelings such as trust toward the brand, which may finally result in a personal attachment to the brand reflected in higher levels of brand loyalty.

Moreover, the suggested development path of property brand equity fits with the stages of GORDON/CALANTONE/DI BENEDETTO's (1993) evolutionary brand equity framework. Firstly, brand awareness and brand associations must be created in tenants' minds; quality and value perceptions are built in on these a second step. Consequently, brand loyalty may emerge.⁶⁴¹

Regarding office leasing decisions, the framework also reflects the basic steps in the leasing process suggested by GERSTNER (2008), which was briefly described in Section **Fehler! Verweisquelle konnte nicht gefunden werden..** After a company has realized a change in its space demand and developed a set of fundamental requirements, the potential tenant starts to acquire information on available office space in the market, which relates to increasing levels of brand awareness and brand familiarity. In the course of site visits and contact with owners and brokers, the leasing center accumulates brand-related experiences that result in a corresponding brand associations network and quality perceptions. As the number of potentially appropriate office properties is successively reduced, the personal contact with representatives of the owner is amplified in additional site visits and initial contract negotiations. In this stage, tenants may develop trust in the people behind the property and establish a first feeling of loyalty and belonging toward the building that might be transferred beyond the final leasing decision and contract closure, becoming the cornerstone of an ongoing tenant-owner relationship.⁶⁴²

Looking at the requirements for brand equity models that were outlined in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, the proposed conceptual framework adds to the theoretical foundation of the property brand equity model and, through its compliance with office leasing processes, contributes to the accessibility and comprehensiveness from a practitioner's point of view.

4.3 Methodology

In order to provide a basis for the operationalization of the suggested brand equity components in chapter **Fehler! Verweisquelle konnte nicht gefunden werden.** and the development of causal hypotheses, it seems appropriate to briefly explain the methodology that was applied to empirically test the brand equity model developed in the course of this study. After a brief outline of relevant aspects of structural equation modeling (SEM) in general, the appropriateness of the partial least squares (PLS) approach as a variance-based technique to estimate causal models is discussed in light of the study setup and the objectives of this work. Afterward, fundamental aspects of PLS-SEM are highlighted, and a set of criteria for the assessment of a path model's quality is introduced.

⁶⁴¹ See GORDON/CALANTONE/DI BENEDETTO (1993), p. 5.

⁶⁴² See GERSTNER (2008), p. 268.

4.3.1 Fundamentals of Structural Equation Modeling

The objective of this study requires an examination of the causal relationships between the suggested model components in order to understand how brand equity is built in an office property context. However, some of the proposed aspects, such as Brand Loyalty or Perceived Quality, are abstract and commonly not measured directly. They are referred to as theoretical constructs or latent variables that are captured through manifest proxy variables, also called indicators or items.⁶⁴³ Moreover, the causal sequence of the basic conceptual model implies that several variables function as dependent and independent variables at the same time.

In order to examine complex relationships between variables, multivariate analyses have been frequently applied in empirical studies in the field of marketing research.⁶⁴⁴ However, methods such as classic regression analysis are concerned only with directly measurable variables and require a clear differentiation between dependent and independent variables.⁶⁴⁵ In contrast, SEM combines elements from regression and factor analysis and thus is applicable in cases of latent variables that are not observed directly and in cases of intervening variables that have the role of dependent and independent variable at the same time.⁶⁴⁶ Since SEM makes it possible to simultaneously model relationships among multiple independent and dependent unobservable variables, one commonly differentiates between exogenous variables that are not explained by a postulated model and endogenous variables that are explained by the relationships in the model.⁶⁴⁷ In this regard, analyses also benefit from the possibility to examine direct and indirect relationships between the variables simultaneously.⁶⁴⁸ Moreover, the method enables researchers to assess the quality of the latent variables and the strength of the relationships between them in one step.⁶⁴⁹ Finally, researchers may explicitly model measurement errors for the observed variables, thus overcoming the simplistic assumption of error-free measurements in classic regression analysis.⁶⁵⁰ Altogether, SEM is thought to have a generally confirmatory character since it relies on testing hypotheses underlying a specified causal model.⁶⁵¹ As a result of the method's explanatory power and flexibility across different study settings, SEM has seen an increasing spread in national and international publications.⁶⁵² In light of these considerations, SEM seems to be an appropriate methodological approach to meet the particularities of this study regarding latent and intervening variables and to test for the hypotheses underlying the suggested brand equity model.

Regarding the potential to draw causal conclusions from the results of an SEM analysis, it should be noted that even if the method is often referred to as causal analysis, estimated relationships between constructs alone do not provide evidence for a causal dependency

⁶⁴³ See HAIR et al. (2014), p. 11; BAGOZZI/PHILIPPS (1981), p. 465. The terms *item* and *indicator* are used synonymously in this work.

⁶⁴⁴ See GIERE/WIRTZ/SCHILKE (2006), p. 683; BRADE (1998), p. 159; FORNELL (1987), pp. 411-412.

⁶⁴⁵ See WEIBER/MÜHLHAUS (2010), p. 19.

⁶⁴⁶ See NITZL (2010), p. 2; WEIBER/MÜHLHAUS (2010), pp. 18-19; HUBER et al. (2007), p. 1.

⁶⁴⁷ See HAENLEIN/KAPLAN (2004), p. 285.

⁶⁴⁸ See SCHILKE (2007), p. 134; ZINNBAUER/EBERL (2004), p. 2; HOMBURG/KEBBEL (2001), p. 53.

⁶⁴⁹ See WEIBER/MÜHLHAUS (2010), p. 18; HENSELER (2005), p. 70.

⁶⁵⁰ See HAENLEIN/KAPLAN (2004), p. 285.

⁶⁵¹ See NITZL (2010), p. 2; WEIBER/MÜHLHAUS (2010), p. 17; TABACHNICK/FIDELL (2007), p. 679.

⁶⁵² See HUBER et al. (2007), p. 1; JAHN (2007), p. 1; HERRMANN/HUBER/KRESSMANN (2006), p. 34.

between them.⁶⁵³ In fact, concluding that a statistically significant relationship between two variables represents a causality is only appropriate when (1) there are theoretical or logical reasons that suggest such an effect, (2) there is a temporal sequence of the changes in the variables, and (3) the independent variable is the only plausible explanation for variations in the dependent variable.⁶⁵⁴ Thus, a statistically significant relationship between two variables is the necessary condition but a theoretical or logical foundation the sufficient condition for causality assumptions. In order to substantiate the assumption of causal dependencies between the brand equity components, this study refers to LAVIDGE/STEINER'S (1961) hierarchy-of-effects model as a general framework for their sequence and builds upon the existing body of knowledge to derive causal hypotheses regarding their specific relationships.

4.3.2 Measurement and Specification of Latent Variables

In order to examine a theoretical construct in an empirical study, it must be clearly defined and its relevant dimensions must be identified (conceptualization). From there, it must be translated into an appropriate set of manifest measurements (operationalization).⁶⁵⁵ For this study, the proposed dimensionality of the brand equity components and their operationalization was based on a literature review covering theoretical considerations and empirical findings from earlier studies. When necessary, construct dimensions and indicators were adapted to the particularities of the office property setting.⁶⁵⁶

The appropriate number of manifest variables needed to capture a certain construct is subject of ongoing discussion: On the one hand, larger indicator sets promise higher levels of reliability and predictive validity.⁶⁵⁷ On the other, an increasing number of variables may drive up the required sample size, add to the length of questionnaires, and result in redundancies.⁶⁵⁸ Nonetheless, multi-item scales have been the dominant convention in construct measurement.⁶⁵⁹ In particular, single-item scales have been criticized for being too simplistic and incapable of capturing the full conceptual domain of a complex concept.⁶⁶⁰ However, more recently, several authors have challenged those widely accepted arguments and emphasized that depending on the particularities of the study setting and the nature of the constructs, single-item measurements may be equally acceptable approaches to capture the content of a latent variable.⁶⁶¹ This study relies on multi-item as well as single-item scales for some of the constructs. The use of the single-item scales is discussed for each of the subject constructs in the course of their operationalization.

⁶⁵³ See FUCHS (2011), p. 2; WEIBER/MÜHLHAUS (2010), p. 13.

⁶⁵⁴ See FUCHS (2011), p. 3; WEIBER/MÜHLHAUS (2010), pp. 13-14; COOK/CAMPBELL (1979), p. 31.

⁶⁵⁵ See WEIBER/MÜHLHAUS (2010), p. 31; BACKHAUS et al. (2010), pp. 51-55; SCHNEIDER/KORNMEIER (2006), p. 130; ZINNBAUER/EBERL (2004), p. 2.

⁶⁵⁶ See Chapter Fehler! Verweisquelle konnte nicht gefunden werden..

⁶⁵⁷ See DIAMANTOPOULOS et al. (2012), pp. 441-446; FUCHS/DIAMANTOPOULOS (2009), p. 196; SARSTEDT/WILCZYNSKI (2009), p. 212.

⁶⁵⁸ See JAHN (2007), pp. 4-5.

⁶⁵⁹ See BERGKVIST/ROSSITER (2009), p. 607; FUCHS/DIAMANTOPOULOS (2009), p. 196.

⁶⁶⁰ See SARSTEDT/WILCZYNSKI (2009), p. 212; HUBER et al. (2007), p. 23.

⁶⁶¹ See DIAMANTOPOULOS et al. (2012), p. 447; SARSTEDT/WILCZYNSKI (2009), pp. 223-224; WANOUS/REICHERS/HUDY (1997), pp. 250-251. In particular, ROSSITER (2002), p. 331 argued that "(...) a concrete singular object to be rated in terms of a concrete attribute needs only a single-item scale."

The above considerations on the number of indicators refer mainly to reflective measurement models. However, depending on the direction of the relationship between a latent variable and its manifest indicators, one can differentiate between reflective and formative measurement approaches. A reflective measurement assumes that the construct causes variations in its indicators, which in turn are measurements of the latent variable, including an error term.⁶⁶² Conversely, formative approaches assume that a set of error-free measurements causes the superordinate construct, which can be understood as a weighted combination of its items.⁶⁶³ Likewise, reflective indicators are expected to have a high level of collinearity, while formative indicators tap into different facets of a phenomenon, so a change in one indicator does not necessarily imply a similar directional change in others. As a consequence, eliminating an indicator from a reflective measurement model should not lead to changes in the latent variable, whereas formative indicators can hardly be eliminated or replaced without altering the conceptual domain of the construct.⁶⁶⁴ JARVIS/MACKENZIE/PODSAKOFF (2003) summarized these main differentiating characteristics of reflective and formative measurement approaches as a guideline for researchers. Table provides an overview of the suggested decision rules.

Table 19: Decision Guideline – Formative vs. Reflective Measurement Models

	Question	Formative	Reflective
Direction of Causality	Are the indicators (items) (a) defining characteristics or (b) manifestations of the construct?	Defining characteristics of the construct	Manifestations of the construct
	Would changes in the indicators/items cause changes in the construct?	Yes	No
	Would changes in the construct cause changes in the indicators?	No	Yes
Interchangeability of Indicators/Items	Should the indicators have the same or similar content? / Do the indicators share a common theme?	No	Yes
	Would dropping one of the indicators alter the conceptual domain of the construct?	Yes	No
Covariation among the Indicators	Should a change in one of the indicators be associated with changes in the other indicators?	Not necessarily	Yes
Nomological Net of the Indicators	Are the indicators/items expected to have the same antecedents and consequences?	No	Yes

Source: JARVIS/MACKENZIE/PODSAKOFF (2003), p. 203.

⁶⁶² See SAMMERL (2006), p. 253; FASSOT/EGGERT (2005), p. 37; JARVIS/MACKENZIE/PODSAKOFF (2003), p. 201; HOMBURG/GIERING (1996), p. 6.

⁶⁶³ See NITZL (2010), pp. 6-7; DIAMANTOPOULOS/SIGUAW (2006), p. 263; DILLER (2006), p. 613; GÖTZ/LIEHR-GOBBER (2004), p. 718. In fact, the assumption of an error-free measurement has been sporadically criticized in literature. See, for instance, PETER (1999), p. 176.

⁶⁶⁴ See NITZL (2010), p. 7; JAHN (2007), p. 7; ALBERS/GÖTZ (2006), pp. 669-672.

In past research, an insufficient discussion of those aspects has led to a growing number of misspecifications. In particular, reflective measurement models were often applied in cases where the operationalization of a construct might have demanded a formative specification.⁶⁶⁵ In fact, constructs are not inherently reflective or formative.⁶⁶⁶ Especially complex constructs might be modeled as either formative or reflective.⁶⁶⁷ The choice of a proper measurement model is highly subjective and should be guided by the intention of the researcher and the objective of the investigation.⁶⁶⁸ In cases where a study centers on key success drivers of a specific construct, a formative approach might be recommended, whereas reflective measurement models are commonly preferred when relationships between constructs are in the focus.⁶⁶⁹

This study focuses mainly on the relationships between the suggested constructs in order to examine how brand equity is built in a property context. Moreover, applying formative measurement models generally bears the risk of incomplete and therefore inadequate item sets.⁶⁷⁰ Thus, in line with the majority of reviewed publications in the field of brand equity research, this work relies mainly on reflective measurement models. However, as will be discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, Perceived Quality is modeled as a formative construct in order to tap into the different facets of a building's qualities. Following FUCHS/DIAMANTOPOULOS (2009), all single-item constructs also apply a reflective measurement approach.⁶⁷¹

4.3.3 Overview of Variance-Based and Covariance-Based Approaches

Two different approaches to estimating the parameters of an SEM are commonly applied: a covariance-based approach and a variance-based approach. While covariance-based analyses have long been the commonly accepted standard in this field, variance-based approaches only recently have gained importance, particularly in disciplines such as strategic management, organizational behavior, marketing, and consumer behavior.⁶⁷²

⁶⁶⁵ See, for instance, ALBERS/HILDEBRANDT (2006), pp. 7-8; JARVIS/MACKENZIE/PODSAKOFF (2003), pp. 206-208; and DIAMANTOPOULOS/WINKLHOFFER (2001), p. 274 for a discussion of examples for misspecifications in publications. In fact, ALBERS/HILDEBRANDT (2006), p. 13 challenged the notion of misspecifications. The authors argued that in cases where reflective measurement models were applied instead of formative measurements, the measurement of the constructs is not wrong per se, but limited in its content.

⁶⁶⁶ See HAIR et al. (2014), p. 45.

⁶⁶⁷ See NITZL (2010), p. 5; JAHN (2007), pp. 8-9; ALBERS/HILDEBRANDT (2006), p. 11.

⁶⁶⁸ See HOMBURG/KLARMANN (2006), p. 731.

⁶⁶⁹ See HAIR et al. (2014), pp. 45-46; JAHN (2007), p. 7; ALBERS/HILDEBRANDT (2006), pp. 4, 11; EBERL (2006), p. 657.

⁶⁷⁰ See ROSSITER (2002), p. 308; DIAMANTOPOULOS/WINKLHOFFER (2001), p. 271.

⁶⁷¹ See FUCHS/DIAMANTOPOULOS (2009), pp. 199-200. The authors argued that formative single-item measures are problematic for several reasons: (1) The assumption that a single indicator represents all relevant facets of a construct is implausible. (2) A single indicator will lead to a substantial increase in the residual of the latent variable, resulting in a growing level of ambiguity. (3) Formative constructs build upon a census of indicators, which is hardly achieved with a single item.

⁶⁷² See HENSELER/RINGLE/SINKOVICS (2009), p. 277; NIJSSEN/DOUGLAS (2008), pp. 85-97; AINUDDIN et al. (2007), pp. 58-60; JAHN (2007), p. 11; LEE/YANG/GRAHAM (2006), pp. 623-625; MAHMOOD/BAGCHI/FORD (2004), pp. 11-13; REINARZT/KRAFFT/HOYER (2004), pp. 300-302. For a comprehensive overview of international marketing studies employing PLS, see HENSELER/RINGLE/SINKOVICS (2009), pp. 279-281.

Initially developed by JÖRESKOG (1973), covariance-based techniques of SEM (CB-SEM) are based on confirmatory factor analysis for estimating the causal relationships between latent variables and their measurements at the same time.⁶⁷³ From a mathematical perspective, the covariance-based approach “attempts to minimize the difference between the sample covariances and those predicted by the theoretical model. (...) Therefore, the parameter estimation process attempts to reproduce the covariance matrix of the observed measures.”⁶⁷⁴ Currently, the covariance-based approach to structural equation modeling is supported by a growing number of different software applications, such as LISREL, AMOS, EQS, and MPLUS. However, LISREL has become the most popular tool and a synonym for covariance-based SEM.⁶⁷⁵

In contrast to minimizing the covariance matrix, the variance-based estimation method, introduced by WOLD (1974) under the name NIPALS (nonlinear iterative partial least squares) and regularly referred to as PLS (partial least squares), focuses on maximizing the endogenous variables' variances that are explained by the exogenous variables of a model.⁶⁷⁶ The nonparametric procedure follows a two-step approach: In the initial step, factor scores are calculated for all latent variables as a linear combination of their manifest indicators based on the data collected. For this purpose, factor analysis is applied to reflective constructs, and multiple regression analysis is applied to formative constructs. In the second step, the calculated factor scores are used to estimate the structure of the causal model and thus calculate the path coefficients with the help of regression analysis.⁶⁷⁷ In this regard, the principal of least squares is applied when the aim is an optimal reconstruction of the real data structure.⁶⁷⁸ Regarding statistical software, the variance-based approach is mainly represented by SmartPLS, PLSGraph, and LVPLS.

Since neither of the two is clearly superior in all situations and applications,⁶⁷⁹ a decision between the approaches should be based on a comparison of their specifics in light of a study's particularities.⁶⁸⁰ For this purpose, five main differences between both techniques are briefly summarized in this section, before the next section focuses on the rationale for choosing a variance-based approach in this study.

Sample Size: An initial distinction can be made regarding the sample size required by the two methods. As a rule of thumb, sample sizes of 10 times or at least 5 times the number of the estimated parameters are suggested for covariance-based approaches in order to prevent risks regarding the quality of the model estimation.⁶⁸¹ Other recommendations state that the sample should at least exceed the number of estimated parameters by 50.⁶⁸² For the PLS approach, publications usually refer to a 10-times rule, stating that the

⁶⁷³ For a detailed description of the covariance-based technique see JÖRESKOG (1973), pp. 85-112.

⁶⁷⁴ CHIN/NEWSTED (1999), p. 309.

⁶⁷⁵ See HAENLEIN/KAPLAN (2004), p. 285. For a more detailed discussion of the covariance-based approach, see DIAMANTOPOULOS (1994).

⁶⁷⁶ See HUBER et al. (2007), p. 6.

⁶⁷⁷ See WEIBER/MÜHLHAUS (2010), p. 20.

⁶⁷⁸ See REINARTZ/HAENLEIN/HENSELER (2009), p. 341.

⁶⁷⁹ See HAIR et al. (2014), p. 18; SCHOLDERER/BALDERJAHN (2006), p. 67.

⁶⁸⁰ See HAIR et al. (2014), p. 14; WEIBER/MÜHLHAUS (2010), p. 65.

⁶⁸¹ See WEIBER/MÜHLHAUS (2010), p. 56; HERRMANN/HUBER/KRESSMANN (2006), p. 61; BAGOZZI/YI (1988), p. 80.

⁶⁸² See BAGOZZI (1981), p. 380.

sample size should at least equal the larger of (1) 10 times the largest number of formative indicators applied in a single construct or (2) 10 times the largest number of structural paths directed at a particular construct in the model.⁶⁸³ However, a more differentiated perspective has been advocated in recent publications suggesting that researchers should consider statistical power analysis for multiple regression models. Specifically, COHEN's (1992) work is emphasized; it suggests appropriate sample sizes on the basis of minimum R^2 values, significance levels, the number of structural paths directed at a particular construct, and the level of statistical power.⁶⁸⁴ It should be noted, however, that even if the sample size has been frequently used as a reason for the application of PLS, criticism is growing since "(...) sample size is probably the most often abused argument associated with the use of PLS-SEM."⁶⁸⁵ In fact, it should be noted that although PLS might avoid small sample size issues due to its statistical specifics, it does not have less stringent requirements concerning the overall representativeness of a sample in empirical research.⁶⁸⁶ In fact, there is growing evidence that in many instances, PLS requires a comparable sample size to covariance-based techniques.⁶⁸⁷

Distributional Assumptions: In comparison covariance-based approaches, PLS is a non-parametric method and has no distributional assumptions due to its use of partial least squares regression.⁶⁸⁸ By contrast, depending on the estimation method, covariance-based approaches require a normal distribution of the manifest variables, which is often not the case in empirical research.⁶⁸⁹ Thus, deviations may lead to corresponding biases of the study results.⁶⁹⁰

Model Evaluation: Covariance-based approaches allow for both global and local quality criteria. Criteria such as root mean square error of approximation, chi-square test, comparative fit index, or goodness-of-fit index aim at a holistic evaluation of the model, while local criteria center on specific elements of the model, such as the measurement model.⁶⁹¹ For PLS approaches, the number of appropriate measurements is limited, and commonly accepted global goodness-of-fit criteria are missing due to the variance-based estimation approach and a lack of distributional assumptions.⁶⁹² For this reason, it is commonly sug-

⁶⁸³ See HAIR et al. (2014), p. 20; LOWRY/GASKIN (2014), p. 132; JAHN (2007), p. 15; GÖTZ/LIEHR-GOBBER (2004), p. 721.

⁶⁸⁴ See HAIR et al. (2014), pp. 20-21; LOWRY/GASKIN (2014), p. 133; CHIN/NESTED (1999), p. 327.

⁶⁸⁵ See HAIR et al. (2014), pp. 18-19.

⁶⁸⁶ See HAIR et al. (2014), pp. 18-19.

⁶⁸⁷ See JANNOO et al. (2014), p. 290; LOWRY/GASKIN (2014), p. 132.

⁶⁸⁸ See HAIR et al. (2014), p. 16; HUBER et al. (2007), p. 10; ALBERS/HILDEBRANDT (2006), p. 15; GÖTZ/LIEHR-GOBBER (2004), p. 721.

⁶⁸⁹ See JAHN (2007), p. 12; GÖTZ/LIEHR-GOBBER (2004), p. 721. For covariance-based SEM, several algorithms for estimating a model's parameters exist. Most commonly, the maximum-likelihood (ML) method is used, assuming a normal distribution of the data set. (See BACKHAUS et al. (2010), pp. 368-370; BAUMGARTNER/HOMBURG (1996), pp. 149-150.) If no normal distribution can be assumed, the unweighted least square (ULS) approach is available to carry out model estimations. However, due to its robustness against deviations from normal distribution, the ML approach is often used instead. (See SCHOLDERER/BALDERJAHN (2006), p. 66; REINARTZ/HAENLEIN/HENSELER (2009), p. 341.) Nevertheless, it must be considered that deviations from normal distribution lead to falsifications in ML results, especially if formative measurement models are concerned (see HENSELER/RINGLE/SINKOVICS (2009), pp. 295-297).

⁶⁹⁰ See JAHN (2007), p. 13.

⁶⁹¹ See WEIBER/MÜHLHAUS (2010), pp. 103-138, 157-167.

⁶⁹² See HAIR et al. (2014), p. 101; HUBER et al. (2007), pp. 2005, 15.

gested to apply nonparametric and estimation-oriented quality criteria that account for the character of PLS and focus on a separate assessment of measurement models and structural model.⁶⁹³ According to WEIBER/MÜHLHAUS (2010), a reliable estimation of the overall model can be assumed when the relevant thresholds are fulfilled in all parts of the model.⁶⁹⁴

Model Specification: On a principal level, both covariance- and variance-based approaches allow specification of reflective and formative models.⁶⁹⁵ However, examining formative constructs with the help of covariance-based approaches requires construct specification modifications.⁶⁹⁶ By contrast, PLS approaches do not require adaptations of the model specification, a decisive advantage from a research perspective.⁶⁹⁷ In fact, the inclusion of formative measurement models has been frequently emphasized as a main criterion for the decision between the two approaches.⁶⁹⁸

Study Objectives and Type: PLS is commonly suggested in study settings where the existing body of knowledge is limited and few previous findings and assumptions are available, so the studies have an explorative character.⁶⁹⁹ Moreover, the variance-based approach is preferred when the study objective is to identify main drivers or predict a target construct in terms of explaining its variance.⁷⁰⁰ Thus, PLS is also suggested when the aim is to determine implications for practitioners.⁷⁰¹ Covariance-based approaches, on the other hand, are recommended when the study objective is to test, confirm, or compare well-established theories.⁷⁰²

4.3.4 PLS as Preferred Method

Considering the differences briefly outlined in the previous section, three main arguments speak in favor of applying a variance-based approach in the course of this work; they rely on common recommendations and are also in line with other authors' arguments for selecting PLS.⁷⁰³

⁶⁹³ See RINGLE (2004), p. 17; CHIN/NEWSTED (1999), p. 328.

⁶⁹⁴ See WEIBER/MÜHLHAUS (2010), p. 259.

⁶⁹⁵ See NITZL (2010), p. 18; WEIBER/MÜHLHAUS (2010), pp. 204-205.

⁶⁹⁶ For instance, the construct can be operationalized as a multiple indicators multiple causes model (MIMIC) that includes both formative and reflective indicators to meet identification requirements. Another possibility is to include formative indicators in the form of aggregate single-item constructs. See HAIR et al. (2014), p. 19; NITZL (2010), p. 18; WEIBER/MÜHLHAUS (2010), pp. 211-216; JÖRESKOG/GOLDBERGER (1975), pp. 631-639.

⁶⁹⁷ See HAIR et al. (2014), pp. 16-17; NITZL (2010), p. 18; JAHN (2007), p. 15; SCHLODERER/BALDERJAHN (2006), p. 57; GÖTZ/LIEHR-GOBBER (2004), p. 721; GEFEN/STRAUB/BOUDREAU (2000), p. 6.

⁶⁹⁸ See HAIR et al. (2014), p. 19; LOWRY/GASKIN (2014), p. 132; HUBER/WEIHRAUCH/WEINDEL (2012), p. 42; NASKRENT (2010), p. 225; NITZL (2010), p. 18.

⁶⁹⁹ See HAIR et al. (2014), p. 18; NASKRENT (2010), p. 224; GÖTZ/LIEHR-GOBBER (2004), p. 721.

⁷⁰⁰ See HAIR et al. (2014), p. 19; LOWRY/GASKIN (2014), p. 132; HUBER et al. (2007), p. 42.

⁷⁰¹ See HUBER et al. (2005), p. 16.

⁷⁰² See HAIR et al. (2014), p. 19; WEIBER/MÜHLHAUS (2010), p. 253; JARITZ (2008), p. 156; HUBER et al. (2007), p. 14.

⁷⁰³ See HAIR et al. (2014), p. 19; LOWRY/GASKIN (2014), p. 132; NASKRENT (2010), pp. 225-226; NITZL (2010), pp. 17-21; KORNMEIER (2009), p. 188; LORENZ (2009), p. 188.

For one thing, this study relies on reflective and formative measurement models. Specifically, Perceived Quality is measured on the basis of a set of formative items.⁷⁰⁴ As outlined above, PLS does not require modifications of the model specification and thus explicitly allows for examining the relevance of the different quality facets that can be the basis for practice-oriented recommendations.⁷⁰⁵

For another, the theoretical foundation for an investigation of brand equity in a property context is not very advanced, and all hypotheses and measurement approaches were based on a transfer of findings from other industries and product categories to an office leasing setting. In fact, there has not been a prior comprehensive study aimed at an application of the brand equity concept in a real estate context. In particular, the separate consideration of brand associations' valence, uniqueness, and accessibility has not been applied in this field of research. Consequently, the corresponding hypotheses are derived mainly from studies that examined brand associations as a single construct. Altogether, this initial examination of brand equity in a property context cannot be considered a test of a substantial theory. On the contrary, it highlights a generally explorative character of this study that strongly speaks in favor of the PLS approach.⁷⁰⁶

Finally, this study is aimed at identifying the main drivers of brand equity and understanding how brand equity is built in an office property context. Considering the prediction-oriented character of the method, these objectives apparently suggest a variance-based approach.⁷⁰⁷

Overall, considering the particularities of this study in light of the characteristics outlined in the previous section, PLS seems to be an appropriate method for the purpose of this work. The software application SmartPLS 3 developed by RINGLE/WENDE/BECKER (2014) was chosen for its ease of use and accessibility.

4.3.5 Structural Basics of PLS Path Modeling

At the very basis of structural equation modeling stands the translation of a certain theory into a research model. For this purpose, theoretical and derived concepts are converted into latent variables (e.g., Brand Associations), which are operationalized through indicators and linked by a set of hypotheses.⁷⁰⁸ These research models can be illustrated graphically in the form of path diagrams (also called arrow schemes).⁷⁰⁹ In the following, the basic structure of path models in a PLS context is briefly explained.

Partial least squares path models basically consist of two elements: a structural (inner) model and a measurement (outer) model:⁷¹⁰ The structural model depicts the relationships between the theoretical constructs, symbolizing the interdependencies between exoge-

⁷⁰⁴ See Section **Fehler! Verweisquelle konnte nicht gefunden werden..**

⁷⁰⁵ See HAIR et al. (2014), p. 19; NASKRENT (2010), p. 225; KORNMEIER (2009), p. 188; LORENZ (2009), p. 188.

⁷⁰⁶ See HAIR et al. (2014), p. 18; LOWRY/GASKIN (2014), p. 132; NASKRENT (2010), p. 225; WEIBER/MÜHLHAUS (2010), p. 253; KORNMEIER (2009), p. 188; LORENZ (2009), p. 188; JAHN (2007), p. 16.

⁷⁰⁷ See HAIR et al. (2014), p. 14; KORNMEIER (2009), p. 188; HUBER et al. (2007), p. 11; JAHN (2007), p. 3; HERRMANN/HUBER/KRESSMANN (2006), p. 60.

⁷⁰⁸ See HAIR et al. (2014), p. 11; WEIBER/MÜHLHAUS (2010), p. 19; HAENLEIN/KAPLAN (2004), p. 286.

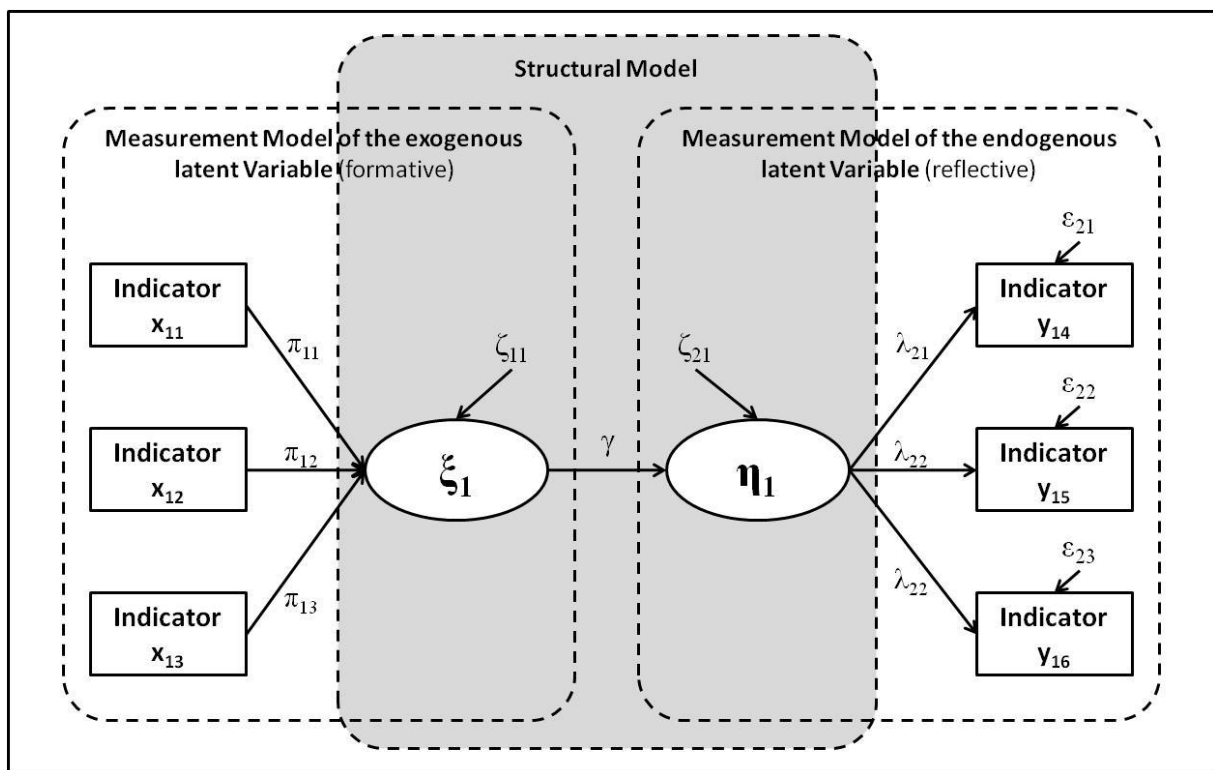
⁷⁰⁹ See NITZL (2010), p. 1; HAENLEIN/KAPLAN (2004), p. 286.

⁷¹⁰ See HAIR et al. (2014), p. 11; JAHN (2007), p. 3; GÖTZ/LIEHR-GOBBER (2004), pp. 716-718.

nous and endogenous variables in a path diagram using arrows to indicate the direction of the connection.⁷¹¹ On the other hand, measurement models reflect the operationalization of constructs through their indicators. In the case of reflective measurements, the connection (illustrated with an arrow) runs from the latent variable to its indicators. By contrast, connections leading from indicators to a latent variable signify formative measurement models.⁷¹² Figure illustrates the general structure of an exemplary PLS path model.

In relevant literature, exogenous latent variables are commonly symbolized as ξ and endogenous latent variables as η . In the same way, indicators of exogenous (endogenous) latent variables are denoted as x (y).⁷¹³ The structural model in the illustration above consists of an exogenous latent variable ξ_1 and an endogenous latent variable η_1 that is theoretically caused by the former. While ξ_1 is a formative construct consisting of three items (x_{11} , x_{12} , x_{13}), η_1 is a reflective construct represented by its three indicators (y_{14} , y_{15} , y_{16}). In the case of the formative measurement model, it is assumed that the items themselves are free of statistical measurement errors, whereas the construct ξ_1 (as well as the endogenous latent variable) underlies an error term ζ_{11} (ζ_{21}). On the other hand, data in the reflective measurement model for η_1 is assumed to incorporate measurement errors at indicator level (ε_{21} , ε_{22} , ε_{23}).⁷¹⁴ Within the formative measurement model, the individual weights of the latent variable's items are entitled π_{11} , π_{12} , and π_{13} . In the same way, the indicator loadings in reflective measurement models are named λ_{21} , λ_{22} , λ_{23} .

Figure 23: General Structure of Path Models



Source: RINGLE et al. (2006), p. 83.

⁷¹¹ See HAIR et al. (2014), p. 12; NITZL (2010), pp. 3-4.

⁷¹² See ALBERS/GÖTZ (2006), p. 669.

⁷¹³ See FUCHS (2011), p. 4; HAENLEIN/KAPLAN (2004), p. 287.

⁷¹⁴ See RINGLE et al. (2006), p. 82.

The strength of causal relationships between latent variables is reflected by path coefficients labeled γ in the structural model above the connecting arrows with a value range from -1 to $+1$. Negative coefficients imply that a higher value in the latent causal variable evokes a lower value in the downstream variable. Correspondingly, positive coefficients imply that higher values in the causal latent variable lead to higher values in the influenced variable. Path coefficients of 0 signify that there is no relationship between the subject variables.⁷¹⁵

4.3.6 Evaluation of PLS Path Models

In the course of the estimation of causal models, the model assessment regarding reliability and validity criteria is a vital step in order to draw conclusions on the quality of the fit between the theoretical model and the empirical data.⁷¹⁶ The proposed model assessment starts with an individual examination of the formative and reflective measurement models. Finally, the structural model is assessed after reliability and validity of all constructs have been established.⁷¹⁷ This section follows this procedure and briefly outlines commonly applied quality criteria for the assessment of PLS models.

4.3.6.1 Reflective Measurement Models

Similar to classic factor analysis, the assessment of reflective measurement models is primarily based on an evaluation of their internal consistency reliability, convergent validity, and discriminant validity.⁷¹⁸

Regarding internal consistency reliability, composite reliability (ρ_c) is commonly suggested as an appropriate criterion to assess whether a latent variable is adequately reflected by its indicators.⁷¹⁹ The adequacy of composite reliability is highlighted by several authors who argue that composite reliability provides more suitable results than Cronbach's α , which is commonly used in classic factor analysis for reflective models, since the latter tends to underestimate internal consistency reliability in a PLS context. By contrast, composite reliability accounts for differences in factor loadings and is independent from the number of items. The criterion can be interpreted in the same way as Cronbach's α , with high levels of composite reliability, suggesting that the indicators of a latent variable show strong and positive correlations with each other and measure the same phenomenon.⁷²⁰ A parameter value below 0.6 is commonly considered to indicate a lack of internal consistency reliability while values between 0.7 and 0.9 are expected in advanced stages of

⁷¹⁵ See NASKRENT (2010), p. 107; NITZL (2010), p. 4; RICHTER (2007), p. 96.

⁷¹⁶ See FUCHS (2011), p. 16. It should be noted that the term *fit* has a different meaning for variance- and covariance-based approaches. Fit statistics for covariance-based techniques rely on the deviation of the empirical covariance matrix and the model-implied covariance matrix. In the case of PLS-SEM, *fit* refers to the discrepancy between the manifest and latent variable scores and the values predicted by the subject model. See HAIR et al. (2014), p. 96.

⁷¹⁷ See HAIR et al. (2014), pp. 100-101; SCHLODERER/RINGLE/SARSTEDT (2009), p. 589. RINGLE (2004), p. 18 suggested a reversed procedure that starts with an assessment of the structural model. However, the assessment of a structural model seems reasonable only when reliability and validity of the underlying measurement models have been ensured.

⁷¹⁸ See HAIR et al. (2014), p. 107; RINGLE (2004), pp. 23-25.

⁷¹⁹ See HAIR et al. (2014), p. 101; RINGLE (2004), p. 23.

⁷²⁰ See WERTS/LINN/JÖRESKOG (1974), pp. 27-29.

research.⁷²¹ In this regard, HAIR et al. (2014) have noted that values above 0.95 are not desirable since they hint at potential redundancies in the indicator set.⁷²²

Concerning reflective constructs' validity, two aspects are examined: convergent validity, signifying that an indicator set exhibits unidimensionality reflecting one and the same underlying construct, and discriminant validity, which states that the indicator sets of two distinct constructs should possess sufficient difference, thus showing no unidimensionality in a joint set.

In order to assess measurement models' convergent validity, FORNELL/LARCKER (1981) suggested the average variance extracted (AVE) as a criterion.⁷²³ The measure refers to the grand mean value of the squared loadings of a subject indicator set, thus indicating the average indicator variance that is explained by a latent variable. Consequently, a parameter value of at least 0.5 indicates that the subject latent variable, on average, explains more than 50% of the variance of its indicators, which is usually applied as a cut-off criterion.⁷²⁴ Some authors, such as HUBER/WEIHRAUCH/WEINDEL (2012), more rigorously suggest a minimum AVE of 0.6.⁷²⁵ However, in exceptional cases, some authors also regard values between 0.4 and 0.5 as acceptable when a construct exhibits satisfactory characteristics in other reliability and validity criteria.⁷²⁶ Overall, the average variance extracted has been frequently applied in publications and is typically considered to be a more conservative criterion than composite reliability since the latter denotes an acceptable value even if more than half of the variance is attributable to measurement errors.⁷²⁷

As another approach to assessing convergent validity, indicator reliability focuses on the proportion of indicators' variance that is explained by the subject latent variable.⁷²⁸ Congruously, correlations between indicators and their latent construct (i.e., their standardized outer loadings) should exceed a value of 0.7, which represents a proportion of explained variance of approximately 50%.⁷²⁹ With an outer loading below 0.4, it is generally recommended to eliminate the respective indicator.⁷³⁰ More specifically, HAIR et al. (2014) stated that although values below 0.4 are unacceptable, the decision to remove indicators with outer loadings between 0.4 and 0.7 should be based on an assessment of the effect of their elimination on the construct's composite reliability and average variance extracted.⁷³¹

⁷²¹ LOWRY/GASKIN (2014), p. 137; HAIR et al. (2014), p. 102; NITZL (2010), p. 26; RINGLE/SPREEN (2007), p. 212.

⁷²² See HAIR et al. (2014), p. 102.

⁷²³ See FORNELL/LARCKER (1981), p. 45.

⁷²⁴ See HAIR et al. (2014), p. 103.

⁷²⁵ See HUBER/WEIHRAUCH/WEINDEL (2012), p. 44.

⁷²⁶ See HOMBURG (2000), p. 103; HOMBURG/GIERING (1996), p. 17.

⁷²⁷ See NITZL (2010), p. 26; GÖTZ/LIEHR-GOBBER/KRAFFT (2009), pp. 695-697; CHIN (1998), p. 321.

⁷²⁸ See NITZL (2010), p. 25.

⁷²⁹ See HAIR et al. (2014), pp. 102-103; GÖTZ/LIEHR-GOBBER (2004), p. 728. The exact value is $\sqrt{0.5}$ but a value of 0.7 is commonly suggested as an approximation. NITZL (2010), p. 25 notes that in some publications (e.g., KRAFFT/GÖTZ/LIEHR-GOBBER (2005), pp. 73-74), a value of 0.4 is sometimes suggested as a cutoff value. However, in those cases, other indicators should have an outer loading that substantially exceeds 0.7.

⁷³⁰ See HAIR et al. (2014), p. 103; ZINNBAUER/EBERL (2004), p. 568; HOMBURG/GIERING (1996), pp. 128-129.

⁷³¹ See HAIR et al. (2014), p. 103. See also HENSELER/RINGLE/SINCOVICS (2009), p. 299; HULLAND (1999), p. 198.

Discriminant validity, denoting the level to which a reflective construct is truly distinct from other constructs, is commonly evaluated on the basis of two complementary criteria: the Fornell-Larcker criterion and indicators' cross loadings.⁷³² The first requires that a latent variable share more variance with its own indicator set than with any other latent variable.⁷³³ Consequently, each latent variable's AVE should exceed the squared correlation with any other construct.⁷³⁴ Referring to the assessment of cross loadings, the outer loading of each indicator with its respective latent variable should be higher than all of its cross loadings with other latent variables.⁷³⁵ If this is not the case, the measurement models should potentially be revised.⁷³⁶ In this regard, some authors suggest that the difference between an indicator's outer loading on its latent variable and its highest cross loading should not exceed 0.2 or 0.1 respectively.⁷³⁷

4.3.6.2 Formative Measurement Models

The assessment of formative measurement models differs extensively from reflective measurement models since indicators do not reflect one and the same theoretical concept but distinct aspects of a superordinate construct.⁷³⁸ Consequently, indicator reliability is not meaningful as an evaluation criterion in a formative context due to the assumption of error-free indicator measurements.⁷³⁹ Reliability in an internal consistency sense also is of minimal importance for formative measurements as two items might even have a negative correlation while representing meaningful facets of a latent variable.⁷⁴⁰ Regarding the validity of formative measurement models, there seems to be no common agreement in literature. Some authors, such as ROSSITER (2002), have argued that "(...) all that is needed is a set of distinct components as decided by expert judgment," thus dismissing all forms of quantitative assessment.⁷⁴¹ On the other hand, EDWARDS/BAGOZZI (2000), for instance, stated that it is bad practice to neglect potential statistical validations.⁷⁴² Similarly, GÖTZ/LIEHR-GOBBER (2004) have emphasized the importance of an external or nomological validation since the assumption of an error-free measurement of all construct facets might not always hold true.⁷⁴³ Against this background, this study follows the suggestion of HAIR et al. (2014), DIAMANTOPOULOS/RIEFLER/ROTH (2008), and DIAMANTOPOULOS/WINKLHOFER (2001) to focus on the assessment of validity using a combination of ra-

⁷³² See HAIR et al. (2014), p. 104. It should be noted, however, that in a recent simulation study, HENSELER/RINGLE/SARSTEDT (2014), pp. 4-6 argued that both Fornell-Larcker criterion and cross loadings might not be sensitive enough to reliably uncover violations of discriminant validity in variance-based SEM.

⁷³³ See RINGLE/SPREEN (2007), p. 213. However, in empirical research, slight deviations from this criterion are accepted. For instance, NASKRENT (2010), p. 255 attributed a sufficient level of discriminant validity even if correlations between constructs exceed the root of the AVE by 0.06. More drastically, PRYKOP (2005), p. 238 accepted that the correlations between the constructs exceed the AVE by 0.292.

⁷³⁴ See LOWRY/GASKIN (2014), p. 136; HAIR et al. (2014), p. 105; FORNELL/LARCKER (1981), p. 387.

⁷³⁵ See HAIR et al. (2014), p. 105; CHIN (1998), p. 321.

⁷³⁶ See Nitzi (2010), p. 28.

⁷³⁷ See GÄNSWEIN (2011), p. 183; NEUFELD/WAN/FANG (2010), p. 236.

⁷³⁸ See SCHLODERER/RINGLE/SARSTEDT (2009), p. 592.

⁷³⁹ See DIAMANTOPOULOS (2006), p. 11; BAGOZZI (1994), pp. 317-385; BOLLEN (1989), p. 222.

⁷⁴⁰ See DIAMANTOPOULOS/RIEFLER/ROTH (2008), p. 1215.

⁷⁴¹ See ROSSITER (2002), p. 315.

⁷⁴² See EDWARDS/BAGOZZI (2000), p. 171.

⁷⁴³ See GÖTZ/LIEHR-GOBBER (2004), p. 719.

tionale and statistical analyses.⁷⁴⁴ For this purpose, models should be examined for convergent validity, collinearity issues, and the significance and relevance of their items.⁷⁴⁵

In the first step, the nomological validity of the formative construct is assessed in order to ensure that all of its relevant aspects are covered through its manifest variables. At this point, the existing body of knowledge should be reviewed, and expert opinions may be taken into account.⁷⁴⁶ Similarly, its path relationships to other latent variables should be in line with expectations derived from the theoretical background and should show corresponding significant path coefficients within the model to ensure that the formative construct covers the intended meaning.⁷⁴⁷ Moreover, redundancy analysis is commonly suggested as another possibility to evaluate a formative construct's convergent validity. For this purpose, several authors propose introducing an additional reflective measurement model for the original formative construct.⁷⁴⁸ Here, a single manifest variable can be employed that is a comprehensive representation of the formative variable. The coefficient of the path between both the formative and the reflective measurement model can be interpreted as a measure of the formative construct's external validity. In this regard, there seems to be no common threshold for external validity. HAIR et al. (2014) stated that "(...) ideally, a magnitude of 0.9 or at least 0.8 and above is desired (...)." ⁷⁴⁹ However, other authors argue that in accordance with the assessment of standardized outer loadings for reflective measurement models, a path coefficient above 0.7 can be considered as sufficient.⁷⁵⁰ DIAMANTOPOULOS/WINKLHOFFER (2001) and FASSOT/EGGERT (2005) stated only that external validity is confirmed if a strong and significant relationship between the formative and the reflective construct is found.⁷⁵¹

Items that exhibit high levels of multicollinearity cast doubt on their relevance and might contribute redundant information, leading to a standard-error inflation that, ultimately, reduces the precision of the item weight estimation.⁷⁵² For this reason, it is commonly recommended to test for multicollinearity between the indicators of a formative construct on the basis of an examination of the bivariate correlations between the items and an assessment of their variance inflation factors. Regarding the analysis of a correlation matrix, high levels of bivariate correlation between items indicate potentially critical levels of multicollinearity.⁷⁵³ With respect to an appropriate cut-off point for assuming multicollinearity, CASSEL et al. (1999) suggested a value of 0.7 since simulations have shown that an indicator correlation of 0.7 still provides results that are close to the true values obtained from

⁷⁴⁴ See HAIR et al. (2014), p. 119; DIAMANTOPOULOS/RIEFLER/ROTH (2008), p. 1215; DIAMANTOPOULOS/WINKLHOFFER (2001), pp. 269-277.

⁷⁴⁵ See HAIR et al. (2014), p. 121; NITZL (2010), pp. 29-32.

⁷⁴⁶ See COLTMAN et al. (2008), pp. 1251-1253.

⁷⁴⁷ See FASSOT/EGGERT (2005), p. 41; DIAMANTOPOULOS/WINKLHOFFER (2001), p. 273.

⁷⁴⁸ Alternatively, a MIMIC approach or a calculation of bivariate correlations is mentioned in literature. DIAMANTOPOULOS/WINKLHOFFER (2001), pp. 272-274 have provided a more detailed discussion of MIMIC modeling. Similarly, for a description of the technique of bivariate correlations, see RAVINCHANDRAN/LERTWONGSATIEN (2005), p. 252-254.

⁷⁴⁹ See HAIR et al. (2014), p. 121.

⁷⁵⁰ See DIAMANTOPOULOS/SIGUAW (2006), pp. 270-272; WINKLHOFFER/DIAMANTOPOULOS (2002), pp. 153-160.

⁷⁵¹ See FASSOT/EGGERT (2005), p. 41; DIAMANTOPOULOS/WINKLHOFFER (2001), p. 273.

⁷⁵² See BACKHAUS et al. (1996), p. 33.

⁷⁵³ See FASSOT/EGGERT (2005), p. 40.

the PLS algorithm. However, CENFETELLI/BASSELIER (2009) proposed a more lenient threshold of 0.8.⁷⁵⁴

As correlation coefficients focus only on pairwise dependencies, the evaluation of a correlation matrix should be complemented by an assessment of items' variance inflation factor, which quantifies the degree of multicollinearity applying an ordinary least squares regression analysis. In fact, it reflects the extent to which the variance of an estimated regression coefficient is increased due to collinearity. In econometrics, a VIF parameter value greater than 10 is considered to reveal a critical level of multicollinearity.⁷⁵⁵ However, as stated in the first study of this work, requirements of 5, 4, and even 3.3 are also found in the literature.⁷⁵⁶ In particular, DIAMANTOPOULOS/SIGUAW (2006) have argued that tolerance values above 0.35 may cause critical levels of multicollinearity.⁷⁵⁷ When critical levels of collinearity are detected, one might consider eliminating or merging indicators or creating higher-order constructs.⁷⁵⁸

Finally, items' individual relevance should be evaluated. In contrast to outer loadings, which equal the bivariate correlation between an indicator and its latent variable, outer weights result from a multiple regression with the latent variable scores as the dependent variable and the formative indicators as the independent variables.⁷⁵⁹ In order to assess the individual relevance of the items of a formative construct, their significance should be considered, which can be obtained from a bootstrapping procedure.⁷⁶⁰ Item weights that are not significant at a level of $p < 0.05$ evolve a minor effect on the formative variable and might be eliminated.⁷⁶¹ Other authors refer to a minimum item weight threshold of 0.1 or 0.2 respectively.⁷⁶² However, eliminating items on the basis of their relative importance might be misleading. In this regard, HAIR et al. (2014) and CENFETELLI/BASSELIER (2009) suggested that researchers should also consider items' absolute importance as reflected in their outer loading. In cases where an indicator exhibits a nonsignificant outer weight but has an outer loading that is considerably high (i.e., above a threshold of 0.5), the indi-

⁷⁵⁴ See CENFETELLI/BASSELIER (2009), p. 697.

⁷⁵⁵ See GREWAL/COTE/BAUMGARTNER (2004), p. 521; DIAMANTOPOULOS/WINKLHOFFER (2001), p. 272; CASSEL/HACKL/WESTLUND (2000), pp. 898-901.

⁷⁵⁶ See HAIR et al. (2014), p. 125; LAWRY/GASKIN (2014), p. 137; GARSON (2012), p. 45; DIAMANTOPOULOS/SIGUAW (2006), p. 270.

⁷⁵⁷ See DIAMANTOPOULOS/SIGUAW (2006), p. 270.

⁷⁵⁸ See HAIR et al. (2014), p. 125. NITZL (2010), p. 31 (referring to DIAMANTOPOULOS/RIEFLER/ROTH (2008), p. 1212) noted in this context that merging indicators may lead to interpretational problems related to the estimated indicator weights and the content domain of the indicators and the construct.

⁷⁵⁹ See CENFETELLI/BASSELIER (2009), p. 697; HAIR et al. (2014), pp. 126-129.

⁷⁶⁰ See HAIR et al. (2014), p. 127; WEIBER/MÜHLHAUS (2010), p. 256; JAHN (2007), p. 18. In a PLS-SEM context, bootstrapping is applied to compensate for the lack of a theoretical distribution function. In the course of a bootstrapping procedure, subsamples of the original data set are randomly drawn (with replacement) and individually used to estimate the model. This process is repeated until a sufficiently large number of samples have been created. The parameter estimates are then used to derive sample means, standard errors, and confidence intervals that can be the basis for the assessment of parameters' significance. See HAIR et al. (2014), pp. 130-138 and BYRNE (2001), pp. 269-271 for a more detailed discussion of bootstrapping in an SEM context.

⁷⁶¹ See HENSELER/RINGLE/SINCOVICS (2009), p. 301.

⁷⁶² See CHIN (1998), p. 324-325; LOHMÜLLER (1989), p. 60-61.

cator would generally be retained. If the outer loading is low, however, the theoretical relevance and conceptual overlap seem questionable.⁷⁶³

Regarding the characteristics of formative constructs, the elimination of indicators based on the outlined criteria is discussed critically in literature. As JARVIS/MACKENZIE/PODSAKOFF (2003) stated, the decision to discard an indicator should never be made on the basis of statistical outcomes since substantial changes in the conceptual content of the formative variable might occur.⁷⁶⁴ Thus, even insignificant formative indicators should be kept in the measurement model if their retention is conceptually justified.⁷⁶⁵

4.3.6.3 Structural Models

After validity and reliability of the formative and reflective measurement models have been confirmed, the structural model, which reflects the hypothesized relationships between the latent variables, is evaluated.⁷⁶⁶ However, in contrast to covariance-based SEM, there is no commonly accepted global criterion for the quality and explanatory power of PLS path models in the sense of a goodness-of-fit index.⁷⁶⁷ A proposal of an overall goodness-of-fit index by TENENHAUS et al. (2005) has been discussed critically, for it is considered to be easily manipulated and applicable in the case of reflective measurement models.⁷⁶⁸ In particular, HENSELER/SARSTEDT (2012) demonstrated that the suggested goodness-of-fit index is not able to separate valid from invalid models and thus is not appropriate for model validation and selection.⁷⁶⁹ For this reason, the results of the structural model are assessed regarding the significances of the path coefficients, the coefficients of determination, the effect sizes, and the predictive relevance.⁷⁷⁰

In the initial step, however, HAIR et al. (2014) have recommended checking the structural model for critical levels of collinearity between the predictor latent variables, which might lead to biases in the estimated path coefficients.⁷⁷¹ For this purpose, the variance inflation factor criterion is applied in accordance with the procedure for formative measurement models that was outlined in the previous section.

The magnitude and significance of path coefficients in PLS models reflect the strength of an exogenous construct's influence on an endogenous construct.⁷⁷² They may range between +1 and -1 and should be interpreted against the theoretical background regarding their algebraic sign, parameter value, and significance. Path coefficients can be interpreted equivalently to standardized beta coefficients of regular least squares regressions;

⁷⁶³ See HAIR et al. (2014), p. 129; CENFETELLI/BASSELIER (2009), p. 698. It should be noted at this point that the threshold of 0.5 suggested by HAIR et al. (2014) equals an explained variance of only 25%.

⁷⁶⁴ See JARVIS/MACKENZIE/PODSAKOFF (2003), pp. 202-204.

⁷⁶⁵ See HENSELER/RINGLE/SINCOVICS (2009), pp. 302-303; JARVIS/MACKENZIE/PODSAKOFF (2003), p. 202.

⁷⁶⁶ See HAIR et al. (2014), pp. 170-171; HUBER et al. (2007), p. 42.

⁷⁶⁷ See RINGLE (2004), pp. 26-28; HUBER et al. (2007), p. 43.

⁷⁶⁸ See NITZL (2010), p. 38; TENENHAUS et al. (2005), p. 173.

⁷⁶⁹ See HENSELER/SARSTEDT (2012), p. 577.

⁷⁷⁰ See HAIR et al. (2014), p. 169; RINGLE/SPREEN (2007), pp. 214-215.

⁷⁷¹ See HAIR et al. (2014), p. 168.

⁷⁷² See JARITZ (2008), p. 173.

their significance can be examined using resampling techniques such as bootstrapping and simple *t*-test methodology.⁷⁷³ Path coefficients above a parameter value of 0.2 or below -0.2 are commonly accepted.⁷⁷⁴ In more complex models, values above 0.4 are already considered substantial.⁷⁷⁵ However, especially in the case of path coefficients between 0.15 and 0.2, it seems appropriate to additionally refer to their significance in order to derive a meaningful assessment.⁷⁷⁶ In this regard, HAIR et al. (2014) have argued that the required significance level strongly depends on the field of research. However, the authors state that for two-tailed tests, critical *t*-values of 1.65 (significance level = 10%), 1.96 (significance level = 5%), and 2.57 (significance level = 1%) are usually applied. Alternatively, researchers frequently refer to *p*-values that denote the probability of erroneously rejecting a corresponding null hypothesis.⁷⁷⁷

It should be noted that path coefficients tend to decline with a growing number of indirect effects between latent variables. For this reason, it has been discussed that the individual interpretation of each path coefficient is of less interest than its total effect, that is, the sum of the direct and all indirect effects of a particular latent variable on another.⁷⁷⁸ In fact, a construct may yield a weak and insignificant direct effect on an endogenous construct, while having a strong, significant indirect effect at the same time. Thus, neglecting variables' total effects may lead to an underestimation of their true importance for a target construct.⁷⁷⁹ Especially in study settings aimed at examining the differential impact of different constructs on a dependent latent variable, total effects may contribute to researchers' understanding of variables' overall influence. In this regard, situations in which the direct effect of a variable is not very strong but its total effect is very pronounced may hint at underlying mediating effects.⁷⁸⁰

The literature discusses several criteria for the appraisal of structural models. The coefficient of determination (R^2) – as used in simple regression analysis – of all final endogenous latent variables is regularly suggested as the most essential measure.⁷⁸¹ The value of R^2 ranges from 0 to 1, with higher levels indicating that larger parts of the endogenous variable's variance are explained by its predictors. Different thresholds are discussed for R^2 , ranging from 0.4 in early stages of research to around 0.6 for later studies. HAIR et al. (2014) suggested values of 0.75 for substantial, 0.5 for moderate, and 0.25 for weak levels of variance explanation.⁷⁸² CHIN (1998) described R^2 values above 0.67 as substantial, 0.33 as moderate, and 0.19 as weak.⁷⁸³ In cases where a latent variable is explained by only one or two exogenous latent variables, moderate R^2 levels are considered suffi-

⁷⁷³ See DEES (2005), p. 72; KRAFFT/GÖTZ/LIEHR-GOBBER (2005), p. 83; CHIN (1998), p. 316.

⁷⁷⁴ See JAHN (2007), p. 17. LOHMÖLLER (1989), pp. 60-62 suggests limits of 0.1 and -0.1.

⁷⁷⁵ See JAHN (2007), p. 10.

⁷⁷⁶ See NASKRENT (2010), p. 258.

⁷⁷⁷ See HAIR et al. (2014), pp. 171-172.

⁷⁷⁸ See ALBERS (2009), pp. 421-423. A variable's indirect effect on a dependent variable is calculated as the product of the direct effects that lie between them via one or more mediating constructs. (See HAIR et al. (2014), p. 174.) According to KENNY (2014) "(...) the indirect effect (...) is the measure of the amount of mediation (...)" in contemporary mediational analysis.

⁷⁷⁹ See NASKRENT (2010), p. 260; HUBER et al. (2007), p. 117.

⁷⁸⁰ See HAIR et al. (2014), pp. 173-174; HENSELER/RINGLE/SINCOVICS (2009), p. 304.

⁷⁸¹ See HANSMANN (1983), pp. 125-128.

⁷⁸² See HAIR et al. (2014), p. 175.

⁷⁸³ See CHIN (1998), p. 323.

cient.⁷⁸⁴ In general, lower values of R^2 may also indicate that relevant influencing factors have been neglected.⁷⁸⁵ Following the advice of RINGLE (2004), CHIN's recommendations are mainly applied in this work.⁷⁸⁶

In order to examine whether a certain exogenous latent variable evolves a substantial influence on a specific endogenous latent variable, effect size f^2 can be calculated. This criterion indicates the change in R^2 if the subject exogenous construct is included in the model estimation against a case in which it is excluded, thus reflecting the prediction-oriented character of PLS-SEM. In other words, the effect size denotes the overall effect of a variable across all relevant relationships in the model.⁷⁸⁷ According to COHEN (1988), who first introduced effect size as a relevant criterion, f^2 values of 0.02, 0.15, and 0.35 signify small, medium, and large effects.⁷⁸⁸ These thresholds seem to be widely accepted in research and are frequently applied in publications across different study settings.⁷⁸⁹ The following Formula allows the determination of f^2 .

Formula 10: Effect Size f^2

$$f^2 = \frac{R^2_{included} - R^2_{excluded}}{1 - R^2_{included}}$$

Source: COHEN 1988, p. 83.

Another common criterion in the assessment of structural models is Stone-Geisser's Q^2 , which reflects a model's predictive relevance in terms of its capability to accurately predict the indicators of its endogenous latent variables.⁷⁹⁰ The application of Stone-Geisser's criterion is based on a so-called blindfolding procedure in which a part of the data is systematically assumed to be missing. The omission distance determines the systematic sequence of data point elimination and is commonly chosen as a value between 5 and 10.⁷⁹¹ In this regard, HAIR et al. (2014) noted that "(...) the number of observations used in the model estimation divided by the omission distance (...)" should not be an integer, in order to prevent the deletion of full rows of the data matrix.⁷⁹² Hereupon, the missing part is replaced by data reconstructed based on the specified PLS model.⁷⁹³ Comparing the original with the reconstructed data set, Q^2 indicates to what degree the missing part of the da-

⁷⁸⁴ See BAUER (2002), pp. 250-253.

⁷⁸⁵ See SCHLODERER/RINGLE/SARSTEDT (2009), p. 594.

⁷⁸⁶ See RINGLE (2004), p. 19.

⁷⁸⁷ See NITZL (2010), pp. 34-35.

⁷⁸⁸ See COHEN (1988), p. 83; HENSELER/RINGLE/SINKOVICS (2009), p. 303. In this regard, HELM/MARK (2012), p. 314 pointed to a study of AGUINI et al. (2005), revealing that average effect sizes in research contributions are around 0.005, thus clearly deviating from Cohen's requirements.

⁷⁸⁹ See HAIR et al. (2014), p. 178; NASKRENT (2010), p. 264; HENSELER (2005), p. 74; GÖTZ/LIEHR-GOBBER (2004), p. 731.

⁷⁹⁰ See GEISSER (1974), pp. 102-105; STONE (1974), pp. 120-122.

⁷⁹¹ See NASKRENT (2010), p. 265; NITZL (2010), p. 36.

⁷⁹² See HAIR et al. (2014), pp. 178-180.

⁷⁹³ See KRAFFT/GÖTZ/LIEHR-GOBBER (2005), p. 84.

ta matrix was reconstructed correctly by the model.⁷⁹⁴ If the parameter value for Q^2 is above zero, it can be concluded that the exogenous variables of the model yield predictive relevance.⁷⁹⁵ Formula shows the required mathematical operation.

In accordance with the mathematical procedure to determine the effect size f^2 , the relative impact of specific variables on the predictive relevance can be assessed with the measure q^2 . Here, values of 0.02, 0.15, and 0.35 reveal a small, medium, or large predictive relevance of a certain latent variable in explaining the subject exogenous latent variable.⁷⁹⁶ However, in contrast to the effect size, the relative measure of predictive relevance has clearly not yet found widespread support in recent publications. For instance, while applying path coefficients, significances, R^2 , and Q^2 , SARSTEDT/WILCZYNSKI/MELEWAR (2013), NASKRENT (2010), HELD (2009), and LORENZ (2009) did not refer to the q^2 criterion in the course of their analyses.⁷⁹⁷ In fact, RINGLE/SARSTEDT/STRAUB (2012) found in their meta-analysis across 169 publications in the field of PLS-SEM that q^2 had not been applied at all, thus clearly questioning the overall acceptance of the quality criterion.⁷⁹⁸ In line with the vast majority of publications, this study does not refer to the individual impact of the variables on the predictive relevance.

Formula 11: Stone-Geisser Criterion

$Q_j^2 = 1 - \frac{\sum_k E_{jk}}{\sum_k O_{jk}}$	<p>with:</p> <p>E_{jk} = square sum of prediction errors</p> <p>O_{jk} = square sum of the difference between estimated value and mean value of remaining observations</p>
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Source: LORENZ (2009), p. 208.

4.4 Construct Dimensionality, Measurements and Hypothesized Relationships

Building upon the basic conceptual framework suggested in chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**, this chapter provides a more detailed discussion of the proposed brand equity components, which is required as the fundament of the empirical analysis.⁷⁹⁹ On the basis of a literature review, potential dimensions and facets of each construct are discussed and an appropriate operationalization is proposed. Afterward, empirical evidence from earlier studies and theoretical considerations are combined to derive causal hypotheses on the relation between each brand equity element and its descendants. Since Brand Associations is split up into three separate constructs, this

⁷⁹⁴ See TENENHAUS et al. (2005), p. 174.

⁷⁹⁵ See RINGLE/SPREEN (2007), p. 215; GÖTZ/LIEHR-GOBBER (2004), p. 371.

⁷⁹⁶ See HAIR et al. (2014), p. 184; NITZL (2010), p. 37.

⁷⁹⁷ See SARSTEDT/WILCZYNSKI/MELEWAR (2013), pp. 334-336; NASKRENT (2010), pp. 264-265; HELD (2009), pp. 207-211; LORENZ (2009), pp. 341-350.

⁷⁹⁸ See RINGLE/SARSTEDT/STRAUB (2012), p. 11.

⁷⁹⁹ See HUBER et al. (2007), p. 22; ALBERS/HILDEBRANDT (2006), p. 10; HERMANN/HUBER/KRESSMANN (2006), p. 46.

chapter starts out with this latent variable before the other constructs are presented along the suggested hierarchy of effects.

4.4.1 Brand Associations

4.4.1.1 Literature Review: Dimensionality and Measurement Approaches

Different categorizations of brand associations have been established as contributing to the overall understanding of a brand's image in consumers' minds and are often used as a conceptual basis for the development of appropriate measurement models. Although the overall understanding of the construct appears consistent and clear-cut across publications, operationalizations strongly vary depending on the study approach and partially overlap with other brand equity components, such as brand awareness and perceived quality.

In his frequently quoted paper on brand equity conceptualization, measurement, and management, KELLER (1993) differentiated between three main types of brand associations according to their level of abstraction: (1) product-related and non-product-related attributes; (2) functional, experiential, and symbolic benefits; and (3) overall brand attitudes. The author highlighted that these brand associations may vary regarding their favorability, strength, and uniqueness, which are the most relevant dimensions in determining the differential response that makes up brand equity, especially in high-involvement decision settings.⁸⁰⁰ Regarding the measurement of the brand association characteristics, the author suggested an indirect approach: To investigate the type of brand associations, free-association tasks and projective techniques are recommended; to cover their favorability and strength, Keller suggested corresponding ratings of evaluations and beliefs; and the uniqueness of brand associations can be assessed in a comparison with associations of competing brands. Indeed, Keller's approach to conceptualizing and operationalizing brand associations is a broad one, and thus many of the brand elements attributed to different dimensions of brand equity by other authors may be viewed as belonging to Keller's overall category of brand image.⁸⁰¹

The basic principles of Keller's approach are also reflected in AAKER's (1991) considerations on the brand associations construct. The author distinguished between three perspectives on brands: (1) value, referring to the functional benefits of a brand that constitute its value proposition; (2) brand personality, referring to the character of the brand as a person; and (3) organizational associations, covering the feelings to trust, credibility, and admiration toward the people, values, and programs behind the brand. Aaker explicitly mentioned that this categorization might not be free from overlaps with the construct of perceived quality and that the relevance of the different perspectives may vary between brands.⁸⁰² Obviously, in comparison to Keller, Aaker has a narrower concept of brand associations. In particular, aspects such as individuals' brand-related attitudes and quality perceptions are not explicitly included in the brand associations construct but belong to

⁸⁰⁰ See KELLER (1993), pp. 3-6. Keller also pointed to the importance of leverage and congruence of brand associations. However, these aspects are not emphasized to the same extent.

⁸⁰¹ See ESCH et al. (2006), p. 99.

⁸⁰² See AAKER (1996), pp. 111-114.

other constructs of Aaker's brand equity concept, such as perceived quality and brand loyalty.

Aaker's and Keller's approaches to categorizing brand associations have been continuously adapted in later research. For instance, PITTA/KATSANIS (1995) and KELLER/APÉRIA/GEORGSON (2008) directly applied Keller's categorization of brand associations to brand attributes, brand benefits, and brand attitudes.⁸⁰³

However, a majority of authors have concentrated on certain aspects of the brand associations construct and adjust the relevant facets to their study context. For example, HAMEED (2012) had a strong focus on attitude associations covering trust, general attitude, and goodwill. In a similar way, ESCH et al. (2006) emphasized the overall attitude and affect toward the brand in their study on chocolates and athletic shoes.⁸⁰⁴

Covering five different product categories (beverages, food, electronics, calculators, shampoo), LOW/LAMB (2000) also built upon Aaker's and Keller's framework, suggesting a multidimensional concept of brand associations covering brand image, brand attitude, and perceived quality. Based on a confirmatory factor analysis, the authors came to the conclusion that the construct is clearly multidimensional and proposed brand image, perceived quality, and brand attitude as relevant dimensions. Moreover, Low/Lamb found that brand familiarity moderates the dimensionality of brand associations, with higher levels of the former being associated with a higher complexity of the latter.⁸⁰⁵

Aaker's and Keller's understanding of brand associations as a multidimensional construct is also found in BUIL/DE CHERNATONY/MARTÍNEZ (2013), who covered a wide range of association types focusing on perceived value, brand personality, trust, and sympathy. TONG/HAWLEY (2009) focused more strongly on Aaker's categorization for brand associations and built their measurement on the overall trust, respect, and sympathy toward the brand and its users. Similarly, PAPPU/QUESTER/COOKSEY (2007) also referred to Aaker's approach of the construct and concentrate on brand personality and organizational associations.⁸⁰⁶ BUIL/MARTÍNEZ/DE CHERNATONY (2013) also stayed close to Aaker's conceptualization, covering perceived value, brand personality, and organizational associations in a study on sportswear, consumer electronics, and cars.⁸⁰⁷ JAYAKUMAR/BEJOY (2012) built upon Aaker's approach to brand associations as well and added celebrity and animal associations as relevant categories for the motorbike market.⁸⁰⁸ Similarly, BIEDENBACH/BENGTSSON/WINCENT (2011) and BIEDENBACH/MARELL (2010) focused on personality-related associations, such as flexibility, reliability, and empathy, in a business-to-business context.⁸⁰⁹ By contrast, in their study on shampoos, color TVs, and PCs, WANG/WEI/YU (2008) strongly focused on organizational associations.⁸¹⁰

⁸⁰³ See KELLER/APÉRIA/GEORGSON (2008), p. 52; PITTA/KATSANIS (1995), pp. 54-55.

⁸⁰⁴ See ESCH et al. (2006), pp. 101-102.

⁸⁰⁵ See LOW/LAMB JR. (2000), pp. 353, 361-362.

⁸⁰⁶ See PAPPU/QUESTER/COOKSEY (2007), p. 741.

⁸⁰⁷ See BUIL/MARTÍNEZ/DE CHERNATONY (2013), p. 72.

⁸⁰⁸ See JAYAKUMAR/BEJOY (2012), p. 55.

⁸⁰⁹ See BIEDENBACH/BENGTSSON/WINCENT (2011), p. 1101; BIEDENBACH/MARELL (2010), p. 452.

⁸¹⁰ See WANG/WEI/YU (2008), p. 310.

While numerous studies have used a preselected set of associations considered to be relevant and potentially favorable in their respective contexts, YOO/DONTHU (2001) clearly emphasized the strength dimension of Keller's categorization approach. Their measurement model focuses on the ease of accessing brand-related associations and recognizing a specific brand among others, thus focusing on the accessibility of brand-specific associative networks.⁸¹¹ In their analysis, the authors found a lack of discriminant validity between the constructs of brand associations and brand awareness and thus suggested a combination of the two. In this context, WASHBURN/PLANK (2002) have argued that while both dimensions are highly correlated, since awareness must precede brand associations, the constructs are not synonymous, because individuals can be aware of a brand without having strong associations linked to it.⁸¹² It must also be stated at this point that Yoo/Donthu applied measurements for the brand association construct that have been attributed to brand awareness by other authors and were also related to accessibility and ease of recall by Keller. Consequently, a low level of discriminant validity could be expected due to the substantial overlap between the measurements of both constructs. A similar operationalization of brand associations that focuses on Keller's strength dimension was also applied in later publications by, for instance, WASHBURN/PLANK (2002), GIL/ANDRÉS/SALINAS (2007), and KIM/HYUN (2011).

A more comprehensive approach to capturing brand associations has been suggested by ESCH (2008): Following KELLER's (1993) differentiation of brand knowledge into brand awareness and brand image (represented through individuals' brand-specific mind-set), the author proposed an extended set of eight characteristics that can be used as a coding scheme to capture brand associations in the course of a free elicitation: (1) the overall kind of association, distinguishing between emotional and cognitive memories; (2) the strength of associations' linkage to the brand; (3) associations' representation, differentiating between verbal and nonverbal; (4) their uniqueness, referring to general associations belonging to all brands of the respective product category and brand-specific associations that are unique for a subject brand; (5) the overall amount of associations; (6) associations' relevance for stakeholders' overall assessment of the brand; (7) associations' direction, ranging from pleasant to unpleasant memories; and (8) the accessibility of brand associations, denoting the ease with which they can be retrieved from memory.⁸¹³

The approach taken by PERSSON (2010) in his business-to-business study on packaging suppliers is similar. The author covered the content, favorability, and uniqueness of brand associations in a structured elicitation and explicitly asks for personality-related associations. Similarly, OAKENFULL/MCCARTHY (2010) did not apply a preselected set of potentially relevant and favorable associations but focused on the number, accessibility, and uniqueness of respondents' associations in an elicitation approach. This is also supported by CHEN (2001), who used a free-association approach and applies a coding scheme to categorize and count the associations by favorability and type (functional and nonfunctional product associations, corporate ability, and corporate social responsibility associa-

⁸¹¹ See YOO/DONTHU (2001), p. 14.

⁸¹² See WASHBURN/PLANK (2002), p. 58.

⁸¹³ See ESCH (2008), p. 66.

tions).⁸¹⁴ ROMANIUK/NENYCK-THIEL (2013) and BOGOMOLOVA/ROMANIUK (2010) chose a similar yet less-free approach, using a choice technique to associate brands with a preselected set of attributes. In the latter case, the attributes covered service, logistics, availability, advice, adaptation, and price as relevant associations in a business-to-business financial services market.⁸¹⁵ In a hypermarket context, ANSELMSSON/JO-HANSSON/PERSSON (2007) applied a free-association approach and identify country of origin, health attributes, environmental responsibility, and organizational associations as relevant categories of grocery brand associations. Additionally, the authors highlighted the uniqueness of brand associations as a separate element of brand equity.

Clearly, there is wide agreement that from a conceptual view, brand associations are a multidimensional construct. However, only a minority of studies have examined the different facets and their individual antecedents and consequences separately. One study that principally follows this approach is the work of PINA/IVERSEN/MARTÍNEZ (2010). The authors developed a three-dimensional concept of brand associations covering functional image, affective image, and reputation and examine the measurement models separately for each dimension. However, in their final path model analysis, the authors did not differentiate between the three aspects but instead calculated the overall image as the arithmetic mean of their indicators.⁸¹⁶

In only a few studies, the construct is split up into different subconstructs that are examined separately for their relationship with other constructs. For example, on the basis of qualitative interviews, PERSSON (2010) identified six different dimensions of the brand associations construct (brand familiarity, product solution, service, distribution, relationship, and company associations) and postulated individually positive relations between the dimensions and respondents' willingness to pay a price premium for a certain brand.⁸¹⁷ BUIL/MARTINEZ/DE CHERNATONY (2013) differentiated between value associations, brand personality associations, and organizational associations, employing a reflective measurement model for each construct. On this basis, the authors clearly demonstrated that the different constructs have a distinct relation to brand loyalty and overall brand equity in their study.⁸¹⁸ In a similar manner, DEL RÍO/VÁZQUEZ/IGLESIAS (2001) modeled four reflective constructs covering different dimensions of brand associations based on brand functions (guarantee, personal identification, social identification, and status). Path model analysis suggested individual relationships between the four constructs and three outcomes of brand equity (extension, recommendation, and price premium). Furthermore, the authors explicitly stated that it is advisable to "analyze the individual effects of each of the different dimensions (...)" in order to "(...) guide brand decisions more appropriately (...)." ⁸¹⁹

The literature review demonstrates that brand associations are a highly complex construct whose operationalization strongly depends on the study purpose and industry context. However, Aaker's and Keller's framework to measuring brand associations is frequently

⁸¹⁴ See CHEN (2001), p. 443.

⁸¹⁵ See ROMANIUK/NENYCK-THIEL (2013), p. 68; BOGOMOLOVA/ROMANIUK (2010), p. 1264.

⁸¹⁶ See PINA/IVERSEN/MARTÍNEZ (2010), pp. 953-956.

⁸¹⁷ See PERSSON (2010), pp. 1272-1273.

⁸¹⁸ See BUIL/MARTINEZ/DE CHERNATONY (2013), p. 68.

⁸¹⁹ See DEL RÍO/VÁZQUEZ/IGLESIAS (2001), pp. 413, 420-421.

adapted and is the basis of a majority of publications in this field. Attribute-, benefit-, and attitude-related associations, as well as value, personality, and organizational associations, are applied as a means to categorize the construct and provide focus to its measurement.

Across studies, three basic characteristics of brand associations are implicitly or explicitly included in the majority of publications: accessibility, favorability, and uniqueness of brand associations. Those facets are frequently emphasized as the underlying reasons for associations' attitudinal and behavioral effectiveness. However, few studies focus directly on these aspects. In contrast, they are implicitly considered in the preselection of appropriate industry- and product-specific sets of associations that regularly comprise attributes that are supposed to be potentially relevant, strong, favorable, and unique.⁸²⁰ Similarly, they are sometimes reflected in separate indicators within the attribute set.⁸²¹

4.4.1.2 Proposed Dimensionality and Measurement Approach

Against this background, this study focuses on these three characteristics of brand associations that are continuously emphasized in the reviewed literature on brand equity and brand associations and that are also supported by the underlying theories on associative networks, the availability-valence heuristic, processing fluency theories, and imagery. Firstly, accessibility, in terms of the perceived ease with which brand associations are retrieved from memory, was frequently identified as a precondition for the effectiveness of stored knowledge and as an influencing factor in evaluation tasks and decision making.⁸²² Secondly, valence, referring to the favorability of brand associations in individuals' perception, was continuously highlighted as a main determinant of the direction in individuals' judgments. Thirdly, uniqueness, describing the level of differentiation in terms of associations that are not shared with competitors or the product category, was identified as the basis for a brand's unique selling proposition. Together, accessibility, valence, and uniqueness of brand associations are frequently considered to form the basis of brand associations' effectiveness in the course of evaluations and decision making on a cognitive level. The importance of the three dimensions was explicitly highlighted by KELLER (1993), who stated that they are main determinants of the differential response that makes up brand equity, an assertion that has been repeatedly quoted by later authors.⁸²³ Especially in high-involvement situations, which – as briefly highlighted in Sections **Fehler! Verweisquelle konnte nicht gefunden werden.** and **Fehler! Verweisquelle konnte nicht gefunden werden.** – is frequently the case in leasing processes, Keller ascribed a high level

⁸²⁰ See, for instance, BIEDENBACH/BENGTSSON/WINCENT (2011); HYUN/KIM (2011), p. 432; PINA/IVERSEN/MARTÍNEZ (2010), p. 954; WANG/WEI/YU (2008), p. 310.

⁸²¹ See, for instance, TONG/HAWLEY (2009), p. 267; GIL/ANDRÉS/SALINAS (2007), p. 193; WASHBURN/PLANK (2002), p. 48.

⁸²² At this point, the difference between the accessibility of brand associations and brand awareness should be clearly highlighted: While brand awareness refers to the accessibility of a certain brand under different conditions in terms of recall and recognition, the accessibility of the brand associations denotes the ease and fluency in which brand-related associations can be retrieved. The corresponding discussion of brand awareness is found in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**

⁸²³ See KELLER (1993), p. 3. See also, for instance, ROMANIUK/NENYCH-THIEL (2013), p. 68; BOGOMOLOVA/ROMANIUK (2010), p. 68; ESCH (2008), p. 595; GIL/ANDRÉS/SALINAS (2007), p. 189; MÖLL (2007), pp. 36-38; CHEN (2001), p. 440.

of importance to these dimensions of brand associations. From a practice-oriented perspective, the three dimensions are also supported: They are reflected in three (differentiation, esteem, and knowledge) of the four main pillars of Young & Rubicams Brand Asset Valuator, discussed in section **Fehler! Verweisquelle konnte nicht gefunden werden..**

The question arises as to how exactly the construct should be specified regarding its dimensionality and the relation between accessibility, valence, and uniqueness and the overall brand associations construct.

Regarding the accessibility, valence, and uniqueness of brand associations, which are the focus of this study, there is strong support for modeling the three dimensions as separate constructs. The publications from the field of cognitive psychology discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden.** especially suggest that the three aspects may have distinct effects on individuals' judgments and decision making. For instance, a feeling of fluency and ease in the retrieval and processing of brand associations was found to lead to more favorable evaluations, thus implying that accessibility and valence might be considered two different constructs that are positively related with each other. Similarly, MEYVIS/JANISZEWSKI (2004) found that if two brands have equally desirable associations, individuals prefer the extension from the brand with the more accessible benefit associations.⁸²⁴ On the one hand, this indicates that brand associations' accessibility and valence are two distinct concepts and, on the other hand, that there might be differences in their relationship, with consequences for brand equity (attitude toward brand extensions). In the same way, KÜSTER-ROHDE (2009) implied that based on the availability-valence hypotheses, accessibility and valence are two different constructs, since accessibility is related to the selection of associations used in a certain evaluation and valence is associated with the direction and magnitude of the judgment.⁸²⁵ Moreover, the uniqueness of brand associations was found to have a positive effect on the ease of retrieval, thus strengthening the understanding of uniqueness and awareness as two different and positively related constructs.⁸²⁶ Similarly, CHANG (2004) focused on associations' uniqueness as an individual construct and found that uniqueness determines their perceived relative informativeness and may ultimately lead to more favorable brand evaluations in a competitive setting.⁸²⁷

Against the background of this theoretical and empirical support, accessibility, valence, and uniqueness are modeled as three distinct (reflectively measured) constructs in this study. In line with BUIL/DECHERNATONY/MARTÍNEZ's (2013) argument that "(...) brand equity dimensions, such as brand image, may be expanded to clarify the structure of this construct in detail,"⁸²⁸ this approach allows for examining their relationships with other constructs as well as their importance within the brand equity context at an individual level. Consequently, the understanding of brand associations' role in a real estate context may be enhanced and more detailed conclusions for real estate practitioners derived.

⁸²⁴ See MEYVIS/JANISZEWSKI (2004), p. 354.

⁸²⁵ See KÜSTER-ROHDE (2009), p. 78.

⁸²⁶ See MEYERS-LEVY (1989), pp. 203-206; GREENWALD/LEAVITT (1984), pp. 582-583. See also FAZIO (1986) for a more comprehensive discussion.

⁸²⁷ See CHANG (2004), p. 701.

⁸²⁸ BUIL/DECHERNATONY/MARTÍNEZ (2013), p. 66.

Regarding the concrete measurement of the three constructs, the literature review shows that operationalizations strongly depend on the specific study purpose and industry context. Generally, two approaches can be distinguished, the first being a more quantitative approach, using multiattribute scales to capture product- or industry-specific associations preselected on the basis of their relevance. The measurements focus on the degree to which the attributes are associated with a certain brand. In this way, a range of association sets for different industries and types of associations has been developed.⁸²⁹ The second is a more qualitative approach, applying association tasks in combination with a coding scheme covering an assessment of relevant association characteristics.⁸³⁰

From the perspective of this study, an application of an existing list of associations seems impracticable since no scale or even initial suggestions have yet been developed for office properties that capture the accessibility, valence, and uniqueness of brand associations. A preselection of potentially relevant associations would also set a restriction on the examination of respondents' associative network.⁸³¹ For this reason, and in line with CHANDON's (2003) suggestion, it seems appropriate to choose an approach that provides a comprehensive picture of respondents' property-related associations.⁸³²

In this regard, the free-elicitation method is regularly emphasized as an appropriate procedure in line with the spreading activation process (discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**) and appropriate to activate individuals' association network without inducing any particular answer. The method suggests presenting respondents with a stimulus probe cue (property category in this study) and asking them to freely say anything that comes to mind, thus leaving a high degree of freedom to cover respondents' knowledge structures.⁸³³ The result is a verbal description of respondents' perception of a brand that can be used for a classification of the brand associations with the help of a coding scheme. In order to substantiate specific aspects of the brand association network, the qualitative free-elicitation procedure can be complemented by quantitative methods. For instance, respondents can evaluate their associations in terms of their favorability and relevance. Moreover, in accordance with ESCH's (2008) recommendation, an evaluation of respondents' mental images can complement the free-elicitation method in order to support the measurement. In accordance with the findings from imagery theory briefly described in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, the author highlights vividness, accessibility, and attractiveness as relevant dimensions to capture mental images.⁸³⁴ This approach to assessing associations was also applied in studies by GEUS (2005) and MÖLL (2007).

Thus, in line with the original suggestion by KELLER (1993) and the approaches applied by ROMANIUK/NENYCK-THIEL (2013), PERSSON (2010), OAKENFULL/MCCARTHY (2010), BO-

⁸²⁹ See, for instance, the work of BUIL/DE CHERNATONY/MARTÍNEZ (2013), JAYAKUMAR/BEJOY (2012), and HYUN/KIM (2011).

⁸³⁰ See, for instance, the work of OAKENFULL/MCCARTHY (2010), PERSSON (2010), and CHEN (2001).

⁸³¹ See MÖLL (2007), p. 39.

⁸³² See CHANDON (2003), p. 3.

⁸³³ See CHANDON (2003), p. 3; KORCHIA (1999), pp. 147-149. For a more detailed discussion of the free elicitation approach see, for instance, OLSON/MUDERRISOGLU (1978), pp. 269-275.

⁸³⁴ See ESCH (2008), p. 598.

GOMOLOVA/ROMANIUK (2010), ESCH (2008), MÖLL (2007), GEUS (2005), and CHEN (2001), this study employs a free-association approach that is analyzed with the help of a coding scheme and complemented by respondents' own assessments of their brand associations and mental images. In this way, accessibility, valence, and uniqueness of brand associations can be captured and prepared for further analyses.

A broad association instruction was chosen to ensure that respondents can provide an unbiased picture of their association network.⁸³⁵ Based on ESCH/GEUS (2005) and MÖLL (2006), the association instruction in this study was:⁸³⁶

"(Property brand name) is a property that you know. Please think of (property brand name) and say everything that comes to mind. In addition to verbal associations, please try to describe feelings, impressions, and pictures that you associate with the property in as much detail as possible. As example: When you think of the Empire State Building, you might recall associations such as the city of New York, the characteristic shape of the building, or its illumination at night. Moreover, you might also think of more abstract issues such as the American dream, freedom, or power. Similarly, personal experiences and memories such as your last vacation might come up to your mind. Please, now, think of (property brand name) and name everything that you associate with (property brand name)."

Respondents were allowed to name up to 10 associations, so it can be assumed that the most relevant aspects of their brand-related associations were captured.

Brand associations' valence, referring to their favorability, was covered in a combination of two respondent judgments adapted from ESCH (2008) and MÖLL (2007) and also generally supported by the work of CHEN (2001) and the original suggestion by KELLER (1993).⁸³⁷ First, after the elicitation procedure, respondents were asked to rate every single association regarding its favorability on a seven-point scale from 1 "very unpleasant" to 7 "very pleasant" and its relevance for their overall judgment on a scale from 1 "not relevant at all" to 7 "very relevant." Adapting MACKAY's (2001) measurement approach, the *Relevance-Weighted Mean Favorability (VAL1)* was then calculated for each observation, resulting in an overall score from 1 "very unpleasant overall" to 7 "very pleasant overall."⁸³⁸ In addition, building upon the work of ESCH (2008) and MÖLL (2007), we asked respondents to retrieve their mental image of the brand and rate its overall *Attractiveness (VAL2)* on a seven-point scale from 1 "very unattractive" to 7 "very attractive."⁸³⁹

In order to capture the accessibility facet of brand associations, the ease with which brand-related associations can be retrieved from memory, respondents were instructed to call up their mental image of the brand in their inner eye and rate the *Ease of Retrieval (ACC1)* on a seven-point scale from 1 "very difficult to retrieve" to 7 "very easy to retrieve,"

⁸³⁵ MÖLL (2007), pp. 139-140; ESCH/GEUS (2005), pp. 1276-1277; and LANGNER (2003), p. 181 have argued that a narrow association instruction (e.g., "Please name all functional attributes of property X that come to your mind") reduces the fluency of the association process in comparison to a wider instruction ("Please name anything that comes to your mind when thinking about property X").

⁸³⁶ See MÖLL (2007), p. 142; ESCH/GEUS (2005), p. 1277.

⁸³⁷ See ESCH (2008), pp. 595, 599; MÖLL (2007), p. 143; CHEN (2001), p. 446; KELLER (1993), p. 14.

⁸³⁸ See MACKAY (2001), p. 41.

⁸³⁹ See ESCH (2008), p. 599; MÖLL (2007), p. 143.

and its *Clarity and Detail* (ACC2) on a scale from 1 “very unclear and undetailed” to 7 “very clear and detailed.” Both indicators were based on the suggestions by ESCH (2011), ESCH (2008), and MÖLL (2007) and are generally supported by the work of RUGE (1988), who based his measurement approach on MARKS (1972).⁸⁴⁰

In accordance with MÖLL (2007) and OAKENFULL/MCCARTHY (2010) and also in line with ROMANIUK/GAILLARD's (2007) similar approach, the uniqueness facet, referring to the level of differentiation in terms of associations that are not shared with competitors or the product category, was captured in a classification procedure on the basis of the free-elicitation process.⁸⁴¹ All associations were counted and classified regarding their uniqueness in terms of being brand-specific or category-specific by two independent encoders.⁸⁴² Category-specific associations were those that might be held for all properties in the relevant market (e.g. “in a city,” “has companies as tenants,” or “has an entrance”). Brand-specific associations were uniquely related to a certain property (e.g. “The roof has the shape of a pyramid” or “I had a great conference in this building”). In case of disagreements, the classification was discussed until an agreement was achieved.⁸⁴³ In order to control for variances in the total number of associations, the indicator *Uniqueness (UNI1)* was then calculated as the relative share of unique brand associations compared to the total number of associations. Table provides a brief summary of the indicator set for the constructs. An examination of the Fornell-Larcker criterion and indicators' cross loadings suggested that the three facets of brand associations exhibit a satisfactory level of discriminant validity and supported the decision to split the brand associations construct into three distinct facets. The corresponding assessments of the measurement models are provided in Section **Fehler! Verweisquelle konnte nicht gefunden werden..**

Table 20: Overview of Indicator Set – Brand Associations

⁸⁴⁰ See ESCH (2011), p. 258; ESCH (2008), p. 599; MÖLL (2007), p. 143; RUGE (1988), p. 106; MARKS (1972), pp. 83-108.

⁸⁴¹ See OAKENFULL/MCCARTHY (2010), pp. 281-285; MÖLL (2007), p. 142; ROMANIUK/GAILLARD (2007), pp. 273-274.

⁸⁴² The first encoder was the author. The second encoder was Justine Ocik, a professional expert in experimental psychology and questionnaire design from the IBPM Institute of Psychology and Risk Management.

⁸⁴³ See MÖLL (2007), p. 142 based on AAKER et al. (2001), pp. 423-424.

Construct	Name		Description/Instruction	Scaling	Sources
Valence	VAL1	Relevance-Weighted Mean Favorability	Calculated on the basis of respondents' assessment regarding associations' relevance and favorability (see below)	1 "very unpleasant overall" - 7 "very pleasant overall"	Esch (2008), Möll (2007), Chen (2001), Mackay (2001), Keller (1993)
			Favorability: "Please indicate how favorable this association is in your eyes."	1 "very unpleasant" - 7 "very pleasant"	
			Relevance: "Please indicate how relevant this association is for your overall judgment."	1 "very unimportant" - 7 "very important"	
	VAL2	Attractiveness (of the Mental Image)	"Please indicate how attractive your mental image of (brand name) is to you."	1 "very unattractive" - 7 "very attractive"	Esch (2008), Möll (2007)
Accessibility	ACC1	Ease of Retrieval (of the Mental Image)	"Please indicate how easy it was for you to call up the mental image in front of your inner eye."	1 "very difficult to retrieve" - 7 "very easy to retrieve"	Esch (2011), Esch (2008), Möll (2007), Ruge (1988), Marks (1972)
	ACC2	Clarity and Detail (of the Mental Image)	"Please indicate how clear and detailed your mental image is for you."	1 "very unclear and undetailed" - 7 "very clear and detailed"	
Uniqueness	UNI1	Uniqueness	Calculated as the relative share of unique brand associations compared to the total number of associations on the basis of free elicitation	0 (no brand-specific associations) - 7 (only brand-specific associations)	Oakenfull/McCarthy (2010), Möll (2007), Romaniuk/Gaillard (2007)

Source: Own illustration.

The use of a single-item measure for brand uniqueness can be seen critically, for it might lead to a substantial reduction in measurement quality, and the often-underlying assumption of an error-free measurement might lead to biased conclusions.⁸⁴⁴ Nonetheless, taking into account HAIR et al. (2014), PETRESCU (2013), and the recommendations of DIAMANTOPOULOS et al. (2012) and FUCHS/DIAMANTOPOULOS (2009), the decision seems justifiable for three reasons:⁸⁴⁵ (1) In the course of the data collection, every respondent is asked to answer questions on three different property brands. Thus, including additional measures multiplies the duration and efforts of the survey, most likely resulting in a reduced response rate and increased missing values. (2) The construct is not the main focus of interest in this study. Instead, its role within the overall brand equity framework and its overall nature are of interest. (3) The conceptual domain of brand associations' uniqueness in terms of the proportion of brand-specific associations seems to be sufficiently concrete.

4.4.1.3 Development of Hypotheses

In fact, the separate examination of brand associations' accessibility, valence, and uniqueness complicates the development of hypotheses concerning the relation between the three facets and other brand equity components. Since there are few studies that focus on one or more of those dimensions individually, hypotheses must be derived partially from findings related to the overall brand associations construct.

In this regard, three basic types of sources were applied for this study that are enumerated in decreasing richness: (1) studies that explicitly examine one or more of the three fac-

⁸⁴⁴ See MOOI/SARSTEDT (2011), pp. 28-29; SARSTEDT/WILCZYNSKI (2009), p. 223.

⁸⁴⁵ See HAIR et al. (2014) pp. 46-48; PETRESCU (2013), p. 110-114; DIAMANTOPOULOS et al. (2012), pp. 444-446; FUCHS/DIAMANTOPOULOS (2009), pp. 203-206. Based on simulation studies, DIAMANTOPOULOS et al. (2012), p. 444 additionally suggested that sample sizes below 50 may justify single-item scales. This recommendation is not followed in this study. However, the other arguments – especially the practical considerations regarding the length of the questionnaire – obviously support the application of a single-item measure in this case.

ets and their relations to other brand equity components, (2) studies that incorporate brand associations' accessibility, valence, or uniqueness in their measurement approach for the overall brand associations construct,⁸⁴⁶ and (3) studies that focus on the brand associations construct without a direct reference to the three facets.⁸⁴⁷ The following considerations are based on a combination of these sources in order to provide a broad basis for the development of hypotheses.

From a theoretical perspective, it is widely accepted that based on findings in the field of cognitive psychology, strong (accessible), favorable, and unique brand associations are associated with higher levels of brand equity.⁸⁴⁸ Thus, on a general level, the three constructs should be positively associated with the overall brand equity of a brand.

In one study, GEUS (2005) found significant differences between strong brands (characterized by a high price premium) and weak brands (characterized by a low price premium) regarding the mean accessibility and valence of brand associations, as well as the number of unique associations.⁸⁴⁹ Since the willingness to pay a price premium is commonly considered to indicate a brand's equity, this supports the assumption that the three characteristics of brand associations have a positive relation with this construct. This is also partially supported by KIM/HYUN's (2011) study, in which the authors identified a significant positive relationship between brand associations and overall brand equity applying a measurement model for the brand associations construct that focuses on the accessibility aspect.⁸⁵⁰ Similarly, NETEMEYER et al. (2004) found that higher levels of perceived uniqueness are associated with an increased willingness to pay a price premium.⁸⁵¹

Utilizing a broader measurement of brand associations that included one or more indicators reflecting accessibility, valence, or uniqueness, several studies have identified the construct as a core component of brand equity and found a positive relation with overall brand equity and its consequences such as price premiums, positive attitudes toward brand extensions, a favorable overall attitude toward the brand, and brand performance.⁸⁵² Altogether, this leads to the following three hypotheses:

H_{ACC1}: Accessibility of Brand Associations is positively related to Overall Brand Equity.

H_{VAL1}: Valence of Brand Associations is positively related to Overall Brand Equity.

⁸⁴⁶ For instance, DEL RÍO/VÁZQUEZ/IGLESIAS (2001) developed their set of hypotheses on the basis of earlier studies that applied constructs characterized by a conceptual overlap with their own brand association constructs. See DEL RÍO/VÁZQUEZ/IGLESIAS (2001), pp. 413-415.

⁸⁴⁷ For example, BUIL/MARTÍNEZ/DE CHERNATONY (2013) derived their hypotheses with the help of studies by KELLER/LEHMANN (2003), CHEN (2001), and YOO et al. (2000), even if the operationalizations were not completely in line with the brand association dimensions suggested by the authors. Against this background, BUIL/MARTÍNEZ/DE CHERNATONY did not develop separate hypotheses for perceived value, brand personality, and organizational associations but transferred their postulations from the overall brand associations construct to each of its suggested subdimensions.

⁸⁴⁸ See, for instance, BARKER/VALOS/SHIMP (2012), p. 18; KELLER/APÉRIA/GEORGSON (2008), p. 49; GIL/ANDRÉS/SALINAS (2007), p. 189; ROMANIUK/GAILLARD (2007), p. 268; KELLER (1993), p. 3.

⁸⁴⁹ See GEUS (2005), pp. 147-149.

⁸⁵⁰ See KIM/HYUN (2011), p. 434.

⁸⁵¹ See NETEMEYER et al. (2004), pp. 221-222.

⁸⁵² See, for instance, BUIL/MARTÍNEZ/DE CHERNATONY (2013), p. 68 and TONG/HAWLEY (2009), pp. 267-268.

H_{UNI1}: Uniqueness of Brand Associations is positively related to Overall Brand Equity.

Regarding the relationship between the three constructs and perceived quality, it seems necessary to refer mainly to findings from the field of cognitive psychology and studies that capture the brand associations construct on a more general level.

From this perspective, assuming a positive relation between brand associations' accessibility, valence, uniqueness, and perceived quality obviously has some support. As was discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, the availability-valence heuristic suggests that evaluations of objects and events depend mainly on the accessibility and favorability of associations. Moreover, an increased fluency of the association retrieval process, representing a higher accessibility of associations, is associated with more favorable judgments. Since perceived quality can be considered to be a reflection of individuals' judgment of a brand's ability to fulfill their expectations, one can assume that higher levels of accessibility and valence of brand associations are associated with higher levels of perceived quality. With regard to the construct of uniqueness, NETEMEYER et al. (2004) suggested that against the background of the accessibility-diagnostics heuristic, uniqueness is related to perceived quality since unique associations tend to have a high perceived level of informativeness and consumers might "(...) infer that unique aspects have 'value' or quality."⁸⁵³

From a brand equity perspective, PAPPU/QUESTER/COOKSEY (2005) stated that consumers holding favorable associations toward a certain brand are more likely to develop positive quality perceptions of the branded product.⁸⁵⁴ BIEDENBACH/MARELL (2010) and BIEDENBACH/BENGTTSSON/WINCENT (2011) found a significant positive relation between brand associations and perceived quality, applying a personality-oriented measurement of the construct in their studies on auditing service companies.⁸⁵⁵ Similarly, measuring the construct with a focus on attitudinal aspects, HAMEED (2012) identified a positive relationship between store-related brand associations and perceived quality.⁸⁵⁶ A positive relation between the brand associations construct and quality perceptions has also been confirmed in a study of the consumer electronics market by AMINI et al. (2012), who applied a brand awareness/brand associations construct, as well as by WANG/WEI/YU (2008), who concentrated on organizational associations for shampoos, color TVs, and PCs.⁸⁵⁷ Equivalently, focusing on restaurant chains and an industry-specific operationalization of the construct, HYUN/KIM (2011) found evidence that brand associations are positively related to customers' quality perception, which was also confirmed by LIAO/WIDOWATI/HU (2011) in their study on fast-food chains.⁸⁵⁸ Altogether, three hypotheses are derived on the basis of this brief discussion:

H_{ACC2}: Accessibility of Brand Associations is positively related to Perceived Quality.

H_{VAL2}: Valence of Brand Associations is positively related to Perceived Quality.

⁸⁵³ NETEMEYER et al. (2004), p. 211.

⁸⁵⁴ See PAPPU/QUESTER/COOKSEY (2005), pp. 728-730.

⁸⁵⁵ See BIEDENBACH/BENGTTSSON/WINCENT (2011), p. 1099; BIEDENBACH/MARELL (2010), p. 453.

⁸⁵⁶ See HAMEED (2013), p. 187.

⁸⁵⁷ See AMINI et al. (2012), p. 200; WANG/WEI/YU (2008), p. 311.

⁸⁵⁸ See HYUN/KIM (2011), p. 433; LIAO/WIDOWATI/HU (2011), p. 12934.

H_{UNI2}: Uniqueness of Brand Associations is positively related to Perceived Quality.

Unfortunately, no studies could be identified that explicitly examine the relation between brand associations' accessibility, valence, and uniqueness and the construct of brand trust. However, the potential relationship between the concepts can be approached on the level of the overall brand association construct, as well as on the level of underlying cognitive mechanisms.

From a psychological point of view, the understanding of brand associations as an antecedent of brand trust is clearly supported. Relying on REMPEL/HOLMES/ZANNA (1985), ELLIOTT/YANNAPOULOU (2007) stated that trust evolves out of past experiences and prior interactions from which a knowledge base can be built. From there, trust may develop in a hierarchy of emotional involvement from predictability to dependability, to trust, and sometimes to faith. Consequently, brand-related associations must first be developed before levels of trust can be achieved. In this regard, the stage of trust requires a move from reliance on rational cognitions to reliance on emotion and sentiment and a developing intimacy, which leads to an investment of emotion in the person.⁸⁵⁹ TRAN/COX (2009) also hypothesized that the brand association construct is positively related with brand trust based on attitude theory and consumer-based brand equity theory. However, the corresponding relationship narrowly failed to demonstrate statistical significance in their study on grocery retailers.⁸⁶⁰ Nevertheless, this argument is also supported in the conceptual study by MING/ISMAIL/RASIAH (2011), who pointed out that once customers have favorable images toward a certain brand, those images may have a positive influence on brand trust and eventually reinforce brand loyalty.⁸⁶¹

Other studies in the field of brand equity have found evidence for a positive relation between the constructs. For instance, ESCH et al. (2006) have argued that brand trust requires brand knowledge since consumers need an accessible and favorable representation of a brand in their memory before they can develop trust toward it. In their retail study, the authors confirmed this hypothesis and identified a significant direct impact of brand image (comprising overall attitude, perceived quality, and overall affect) on a consumer's brand trust.⁸⁶² Similarly, BACK (2005) found for the hospitality industry that the congruence between self-image and hotel image has a positive effect on customers' brand loyalty.⁸⁶³ The authors implied that individuals need to acquire brand-related knowledge and respective associations in order to evaluate the congruency between self-image and brand image, which reinforces their trust and fosters the development of attitudinal and behavioral loyalty. Additionally, the result of YOON's (2002) study in an online shop setting highlighted the significant influence of variables related to brand image on brand trust.⁸⁶⁴ KANDAMPULLY/HU (2007) and KANDAMPULLY/SUHARTANTO (2000) also suggested in their hospitality studies that a favorable brand image has a positive influence on customer's trust and fi-

⁸⁵⁹ See ELLIOTT/YANNOPOULOU (2007), pp. 990-991. See also the original work of REMPEL/HOLMES/ZANNA's (1985), pp. 95-112.

⁸⁶⁰ See TRAN/COX (2009), p. 176.

⁸⁶¹ See MING/ISMAIL/RASIAH (2011), p. 72.

⁸⁶² See ESCH et al. (2006), p. 100-102.

⁸⁶³ See BACK (2005), p. 459.

⁸⁶⁴ See YOON (2002), pp. 60-61.

nally drives their loyalty toward the brand.⁸⁶⁵ Similarly, HSU/CAI (2009) concluded in their study on destination branding that brand associations are a necessary basis on which individuals build their trust in a specific destination to deliver its promises and meet or exceed their expectations.⁸⁶⁶ On the basis of these considerations, three hypotheses are derived for the three facets of brand associations in this study:

H_{ACC3}: Accessibility of Brand Associations is positively related to Brand Trust.

H_{VAL3}: Valence of Brand Associations is positively related to Brand Trust.

H_{UNI3}: Uniqueness of Brand Associations is positively related to Brand Trust.

According to TAM/WOOD/JI (2009), brand loyalty is driven by strongly held, enduring favorable brand evaluations in individuals' minds that direct brand-related intentions. Moreover, the authors specifically highlighted the importance of creating favorable brand associations and increasing their accessibility in order to establish attitudinal and behavioral brand loyalty.⁸⁶⁷ On this basis, it seems also reasonable to assume that unique brand associations drive loyal attitudes and behaviors, since a high level of differentiation may limit customers' openness to competing brands.

Corresponding findings that support a positive relation between accessibility, valence, uniqueness, and the construct of brand loyalty can be derived on the basis of studies in the field of brand equity that partially cover the three constructs in their operationalization of the brand association construct. For instance, GIL/ANDRÉS/SALINAS (2007) included indicators reflecting associations' uniqueness and accessibility in their measurement model, demonstrating that brand associations are positively related with brand loyalty.⁸⁶⁸ Equivalently, in their study on sportswear, consumer electronics, and cars, BUIL/MARTINEZ/DE CHERNATONY (2013) found a positive relation between perceived value associations, brand personality associations, and brand loyalty.⁸⁶⁹ Based on a broader measurement approach of the brand association construct, BUIL/DE CHERNATONY/MARTÍNEZ (2013) confirmed this finding.⁸⁷⁰ TU/LIN/HSU (2013), HYUN/KIM (2011), and AMINI et al. (2012) reported similar evidence for the automotive, chain restaurant, and consumer electronics sector.⁸⁷¹ Utilizing a combined brand associations/brand awareness construct, GIL/ANDRÉS/SALINAS (2007) also postulated a positive relation between brand associations and brand loyalty in the field of fast-moving consumer goods.⁸⁷² With a focus on perceived value associations and trust associations, RIOS/RIQUELME (2010) stated that higher levels of these two constructs are associated with higher levels of brand loyalty.⁸⁷³ The positive relation between brand associations and brand loyalty is also emphasized by studies in the business-to-business sector: TRAN/COX (2009), BIEDENBACH/BENGTSOON/WINCENT (2011), BONDESSON (2012), and JUNTUNEN/JUNTUNEN/JUGA (2011) found corresponding evidence for grocery retailers, auditing services, packaging

⁸⁶⁵ See KANDAMPULLY/HU (2007), p. 441; KANDAMPULLY/SUHARTANTO (2000), pp. 348-349.

⁸⁶⁶ See HSU/CAI (2009), p. 5.

⁸⁶⁷ See TAM/WOOD/JI (2009), pp. 48-53.

⁸⁶⁸ See GIL/ANDRÉS/SALINAS (2007), p. 195.

⁸⁶⁹ See BUIL/MARTINEZ/DE CHERNATONY (2013), p. 68.

⁸⁷⁰ See BUIL/DE CHERNATONY/MARTÍNEZ (2013), p. 120.

⁸⁷¹ See TU/LIN/HSU (2013), p. 189; HYUN/KIM (2011), p. 433; AMINI et al. (2012), p. 200.

⁸⁷² See GIL/ANDRÉS/SALINAS (2007), p. 195.

⁸⁷³ See RIOS/RIQUELME (2010), p. 732.

providers, and logistics services.⁸⁷⁴ Against this background, three hypotheses for brand associations accessibility, valence, and uniqueness are developed:

H_{ACC4}: Accessibility of Brand Associations is positively related to Brand Loyalty.

H_{VAL4}: Valence of Brand Associations is positively related to Brand Loyalty.

H_{UNI4}: Uniqueness of Brand Associations is positively related to Brand Loyalty.

With regard to potential relations between brand associations' accessibility, valence, and uniqueness, cognitive theories promise to be informative.

Based on processing fluency theory, high levels of accessibility have been found to increase individuals' evaluations, since individuals associate the pleasant experience of facilitated processing with the overall favorability of the judgment target.⁸⁷⁵ Consequently, a positive relation between brand associations' accessibility and valence can be expected.

Besides elaboration intensity, activation frequency, and activation recency, the uniqueness of memorized associations is considered to be one of the main determinants of the strength of the linkage between memory nodes and thus is perceived as an important factor influencing the accessibility of brand associations.⁸⁷⁶ Similarly, referring to the work of TVERSKY (1972), ROMANIUK/GAILLARD (2007) stated that unique brand associations facilitate consumers' decision-making processes, since they reflect obvious points of differentiation between two brands.⁸⁷⁷ Likewise, they contribute to the perceived processing fluency, reflecting an improved accessibility, which in turn may lead to more favorable judgments of a brand. In addition, considering NETEMEYER et al.'s (2004) argument that unique associations have a high level of informativeness that may induce a perception of value, one can assume that based on the accessibility-diagnostics heuristic, uniqueness might also have a direct positive relation with brand associations' valence.⁸⁷⁸ This argument is also supported by CHANG (2004), whose study provided evidence that the uniqueness of associations drives their perceived diagnostics, which results in improved brand evaluations.⁸⁷⁹ Together, the findings suggest that brand associations' uniqueness relates positively to their accessibility and valence. Based on these considerations, the following three hypotheses are developed:

H_{UNI5}: Brand Associations' Uniqueness is positively related to Brand Associations' Valence.

H_{UNI6}: Brand Associations' Uniqueness is positively related to Brand Associations' Accessibility.

H_{ACC5}: Brand Associations' Accessibility is positively related to Brand Associations' Valence.

⁸⁷⁴ See TRAN/COX (2009), p. 176; BIEDENBACH/BENGTSSON/WINCENT (2011), p. 1099; BONDESSON (2012), pp. 37-38; JUNTUNEN/JUNTUNEN/JUGA (2011), p. 307.

⁸⁷⁵ See KRUGLANSKI/STROEBE (2014), p. 342; CHO/SCHWARZ (2006), p. 319.

⁸⁷⁶ See MEYERS-LEVY (1989), pp. 203-206; GREENWALD/LEAVITT (1984), pp. 582-583. See also FAZIO (1986) for a more comprehensive discussion.

⁸⁷⁷ See ROMANIUK/GAILLARD (2007), p. 268.

⁸⁷⁸ See NETEMEYER et al. (2004), p. 211.

⁸⁷⁹ See CHANG (2004), pp. 700-701.

4.4.2 Brand Awareness

4.4.2.1 Literature Review: Dimensionality and Measurement Approaches

Even if there seems to be wide agreement on a common definition of brand awareness, publications in this field show several different measurement approaches reflecting researchers' individual emphasis. The vast majority builds upon the facets of the construct proposed by AAKER (1996) and KELLER (1993) and their notes regarding potential indicators.

KELLER (1993) suggested that brand awareness generally consists of brand recognition and brand recall. Brand recognition refers to individuals' ability to confirm prior exposure to a brand when confronted with the brand as a cue. Brand recall relates to individuals' ability to retrieve the brand from memory when given a cue such as the product category, the needs fulfilled by the category, or usage/purchase situations. In this regard, top-of-mind awareness describes a primary position of a brand in individuals' minds as measured in unaided recall tests. The relative importance of brand recall and recognition depends on the context of the decision making. In accordance with the elaboration likelihood model, one can assume that brand recognition is of particular importance in low-involvement situations, whereas brand recall is of more value in high-involvement situations. In high-involvement situations, decision makers are likely to spend time and effort on becoming familiar even with unknown brands.⁸⁸⁰ Similarly, brand recognition is of high relevance in circumstances where individuals are exposed to a brand (e.g., in stores), whereas brand recall plays a crucial role in situations where the brand itself is absent.⁸⁸¹

KELLER (1998) pointed out that brand awareness can also be characterized regarding its specific depth and breadth. The likelihood and the ease with which a brand is retrieved from memory are denoted as the depth of brand awareness. A brand exhibiting a deep awareness in an individual's mind is easily recalled, while other brands are recognized only with some effort. On the other hand, the breadth of brand awareness refers to the variety of product categories and purchase and usage situations in which the branded product or service comes to mind. Consequently, this characteristic of brand awareness mainly depends on the structure of brand knowledge.⁸⁸²

AAKER (1996) further differentiated between facets of the brand awareness construct, postulating that there are different levels of awareness: (1) recognition (having heard of a brand), (2) recall (being able to retrieve the brand when given a cue), (3) top-of-mind (referring to the first-named brand in a recall task), (4) brand dominance (recalling only one brand in a recall task; (5) brand knowledge (knowing what the brand stands for), and (6) brand opinion (having an opinion about the brand). The author stated that for new or niche brands, recognition is important, whereas well-known brands should rely on top-of-mind and recall in order to achieve sensitivity in awareness measurements. Since recall ques-

⁸⁸⁰ See KELLER/APÉRIA/GEORGSON (2008), pp. 48-52; ANSELMSSON/JOHANSSON/PERSSON (2007), p. 402; AAKER (1996), pp. 114-115.

⁸⁸¹ See KELLER (1993), p. 3.

⁸⁸² See KELLER (1998), p. 88.

tions can be problematic in surveys, Aaker suggested the use of brand knowledge and brand opinion as alternatives. In fact, this option has been applied by several researchers (e.g., YOO/DONTHU (2001) and other authors following their measurement approach). Aaker further suggested that measures of brand awareness could also focus on symbols and visual imagery based on a free-elicitation task with the brand name as a stimulus.⁸⁸³

Apparently, Keller's brand recall and brand recognition facet form the lower end of Aaker's brand awareness levels. By including a wide spectrum of awareness-related facets, Aaker's approach allows for a more nuanced consideration of the construct. However, this broad perspective also leads to conceptual overlaps with other brand equity-related constructs as higher levels of brand awareness might also be associated with the concept of brand familiarity or brand associations.⁸⁸⁴

In accordance with KELLER'S (1993) advice, ESCH et al. (2006) applied a free-elicitation approach, asking respondents to name all brands that came to their mind regarding the product categories included in the study (athletic shoes, chocolate).⁸⁸⁵ The position of the brands on the recalled list was then coded on a 10-point scale starting with the highest value for the top-of-mind brand. A similar approach was also applied by FAIRCLOTH (2005) in a study on nonprofit companies.⁸⁸⁶ Following the suggestion of AAKER (1996), the author applied a binary single-item first recall measure to identify the top-of-mind position of a brand based on a free-recall list and additionally included a brand familiarity facet.⁸⁸⁷ In their work on motorcycles, JAYAKUMAR/BEJOY (2012) equivalently focused on the brand recall facet of the brand awareness construct. The authors captured top-of-mind awareness and provided respondents with two different functional attributes (fuel efficiency and four-stroke engines) to capture brand recall. In addition, an indicator for brand familiarity was added, thus broadening the measurement toward an understanding of brand awareness that includes respondents' perceived extent of knowledge on the brand.⁸⁸⁸

YOO/DONTHU (2001) referred to Aaker's definition of brand awareness focusing on measures for recognition rather than recall ("I can recognize the brand among other competing brands"; "I am aware of X"). However, in their study, the authors did not find empirical evidence to separate brand awareness from brand associations and thus combined the two constructs. Nonetheless, one must state that the brand association facet was measured with the help of indicators that might also be associated with brand familiarity or the accessibility of brand associations (e.g., "Some characteristics of X come to my mind quickly").⁸⁸⁹ BALDAUF/CRAVENS/BINDER (2003) applied the same indicator set; however, the authors related the measurements to the brand awareness construct alone.⁸⁹⁰ Similarly, RIOS/RIQUELME (2008) referred to Yoo/Donthu's measurement approach, focusing primarily on the indicators related to brand awareness.⁸⁹¹ HYUN/KIM (2011) also built their

⁸⁸³ See AAKER (1996), pp. 114-115.

⁸⁸⁴ See ANSELMSSON/JOHANSSON/PERSSON (2007), p. 504.

⁸⁸⁵ See ESCH et al. (2006), p. 101; KELLER (1993), p. 14.

⁸⁸⁶ See FAIRCLOTH (2005), p. 5.

⁸⁸⁷ See AAKER (1996), pp. 114-115.

⁸⁸⁸ See JAYAKUMAR/BEJOY (2012), p. 55.

⁸⁸⁹ See YOO/DONTHU (2001), p. 3.

⁸⁹⁰ See BALDAUF/CRAVENS/BINDER (2003), p. 227.

⁸⁹¹ See RIOS/RIQUELME (2008), p. 727.

measurement model on Yoo/Donthu's suggestion but applied a reduced indicator set of only four items.⁸⁹² In their study on business-to-business software services, KIM/HYUN (2011) also followed Yoo/Donthu's approach and used a combined brand awareness with associations construct measured with three items covering respondents' general awareness of the brand and the perceived ease with which characteristic, symbols, and logos can be recalled.⁸⁹³ In the same way, in their study on milk, toothpaste, and olive oil, GIL/ANDRÉS/SALINAS (2007) applied a combination of brand awareness and associations covering aspects of recognition, recall, familiarity, and brand associations in their indicator set.⁸⁹⁴ Covering brands from three industries (sportswear, consumer electronics, cars), BUIL/MARTÍNEZ/DE CHERNATONY (2013) and BUIL/DE CHERNATONY/MARTÍNEZ (2013) also built upon the indicators that were used by YOO/DONTHU (2001) and included a measurement of brand familiarity ("X is a brand of (product category) I am very familiar with") as well as an additional indicator related to brand recall. However, in contrast to Yoo/Donthu, the authors clearly associated these measurements to the construct of brand awareness, whereas different measurement models were developed for the facets of the brand associations construct.⁸⁹⁵

Several studies focusing on brand equity in a business-to-business setting have applied another approach to measuring brand awareness. In a logistics services study, DAVIS/GOLICIC/MARQUARDT (2009) did not differentiate between recognition and recall on respondent level but applied a reflective measurement model capturing the extent to which a brand is known by its trading partners (e.g., "The name of our firm (this provider) is well known in our industry").⁸⁹⁶ This approach was also applied by JUNTUNEN/JUNTUNEN/JUGA (2011) in a similar logistics services environment and adapted by CHEN/SU (2012) and CHEN/SU/LIN (2011) in their studies on fastener companies.⁸⁹⁷ The latter authors added indicators that included statements on the overall perception of the brand (e.g., "X company is a leading edge supplier," "X company makes the purchase process easier"), which might indicate an overlap with the constructs of brand associations and perceived quality. Similar to these measurement approaches, WANG/WEI/YU (2008) focused on the extent to which a brand is known in the market ("The brand is very famous") and the perception of brand-related advertisements ("The ads of this brand are very impressive").⁸⁹⁸

There are also approaches applying single measures to capture brand awareness. For instance, BIEDENBACH/MARELL (2010) used a single item focusing on the perceived ease with which the logo of a brand can be recalled.⁸⁹⁹ In the same way, NETEMEYER et al. (2004) followed a single-item approach and concentrate on top-of-mind recall ("When I think of (product category), (brand name) is the brand that first comes to mind").⁹⁰⁰

⁸⁹² See HYUN/KIM (2011), p. 431.

⁸⁹³ See KIM/HYUN (2011), p. 427.

⁸⁹⁴ See GIL/ANDRÉS/SALINAS (2007), p. 193.

⁸⁹⁵ See BUIL/DE CHERNATONY/MARTÍNEZ (2013), p. 120; BUIL/MARTÍNEZ/DE CHERNATONY (2013), p. 72.

⁸⁹⁶ See DAVIS/GOLICIC/MARQUARDT (2009), p. 205.

⁸⁹⁷ See CHEN/SU (2012), p. 63; JUNTUNEN/JUNTUNEN/JUGA (2011) p. 305; CHEN/SU/LIN (2011), p. 1237.

⁸⁹⁸ See WANG/WEI/YU (2008), p. 310.

⁸⁹⁹ See BIEDENBACH/MARELL (2010), p. 452.

⁹⁰⁰ See NETEMEYER et al. (2004), p. 214.

Across all reviewed studies, brand awareness is operationalized following a reflective measurement mode. There were no indications of formative measurement approaches.

To recapitulate, while a common understanding of brand awareness in the context of brand equity research has been developed, there are obvious differences in the measurement and focus of the construct. Brand recall, apparently, is of prior interest in high-involvement settings, and indicators covering aspects of this awareness facet are included in the majority of respective studies. Nevertheless, there are also several studies emphasizing higher levels of brand awareness, such as brand knowledge and brand opinion, therefore including indicators that are in conceptual proximity to brand familiarity and brand associations.

4.4.2.2 Proposed Dimensionality and Measurement Approach

The operationalization of brand awareness in this study focuses on brand recall, which is also reflected in both Aaker's and Keller's conceptualization of the construct. This emphasis is in line with the work of JAYAKUMAR/BEJOY (2012), ESCH et al. (2006), and FAIRCLOTH (2005), who also highlighted the importance of the facet. In accordance with the vast majority of publications in this field, a reflective measurement mode was chosen.

Looking at the particularities of this study, the brand recall focus seems appropriate for two major reasons: (1) In a real estate context, one can assume that brand awareness in the sense of recognition is of minor importance, since leasing decisions are the result of extensive cognitive processes, reflecting a high level of involvement. Thus, in accordance with the elaboration likelihood model, brand recall might be a more relevant measure of brand awareness than brand recognition. (2) Limiting the measurement of brand awareness to brand recall establishes a clear distinction between brand awareness and the concepts of brand familiarity and brand associations' accessibility, thus enabling a separate examination of the constructs. Similarly, the associative network model discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden.** supports differentiating between brand awareness and the accessibility of brand associations. The latter refers to the ease with which brand-related associations are retrieved from memory based on an activation of the brand association network, whereas brand awareness is related to the ease with which a certain brand is retrieved from memory when a stimulus (e.g., product category) is provided.

In line with the work of JAYAKUMAR/BEJOY (2012), PAPPU/QUESTER/COOKSEY (2007), ESCH et al. (2006), and FAIRCLOTH (2005) and also in line with the original suggestions by AAKER (1996) and KELLER (1993), a free-elicitation approach was chosen to capture the brand recall facet in this study. The type of use (office) and the geographical market (Germany) were chosen as cues for the elicitation task, since they describe the potentially relevant market for respective property brands. Accordingly, respondents were asked to name up to five office properties in Germany that spontaneously came to their minds. On this basis, the recall rank and the top-of-mind position of brands were selected to capture the brand awareness construct.

Mainly building upon the suggestions made by ESCH (2008) and ESCH et al. (2006), the position of the brands within the recalled list was coded with the help of a five-point scale

from 1 “mentioned last” to 5 “mentioned first” to derive *Recall Rank (AWA1)* as an indicator of brand awareness.⁹⁰¹ Table provides a summary of the indicator set for brand awareness.

Table 21: Overview of Indicator Set – Brand Awareness

Construct	Name		Description/Instruction	Scaling	Sources
Brand Awareness	AWA1	Recall Rank	Derived from free elicitation	1 “mentioned last” - 5 “mentioned first”	Esch (2008), Esch et al. (2006)

Source: Own illustration.

The use of a single-item measure can be seen critically, for it might lead to a reduction in measurement quality.⁹⁰² Nonetheless, taking into account HAIR et al. (2014), PETRESCU (2013), and the recommendations of DIAMANTOPOULOS et al. (2012) and FUCHS/DIAMANTOPOULOS (2009), the decision seems justifiable for four reasons:⁹⁰³ (1) In the course of the data collection, every respondent is asked to answer questions on three different property brands. Thus, including additional measures multiplies the duration and efforts of the survey, most likely resulting in a reduced response rate and increased missing values. (2) The construct is not the main focus of interest in this study. Instead, its role within the overall brand equity framework and its overall nature are of interest. (3) The conceptual domain of brand awareness in terms of brand recall seems to be sufficiently concrete, and the measurement derived on the basis of respondents’ free elicitation of property brands closely follows the definition of the concept. (4) Unidimensional measurement approaches centering on brand recall usually depict a high level of semantic similarity. According to DIAMANTOPOULOS et al. (2012) and FUCHS/DIAMANTOPOULOS (2009), high levels of item homogeneity potentially reflect item redundancy, indicating that a global single-item measure might be appropriate to capture the construct.

4.4.2.3 Development of Hypotheses

Several studies have investigated the relationship between brand awareness and other dimensions of brand equity. Findings on the consequences of brand awareness in a brand equity context show a common tendency; however, they are not completely consistent but vary depending on contexts and measurement approaches.

For example, DAVIS/GOLICIC/MARQUARDT (2009) identified brand awareness as a relevant component of brand equity in a logistics services setting.⁹⁰⁴ CHEN/SU (2012) and CHEN/SU/LIN (2011) also confirmed a positive relation between brand awareness and overall brand equity in their studies on fastener companies.⁹⁰⁵ Similarly, in their study on motorcycles, JAYAKUMAR/BEJOY (2012) found evidence for a significant positive relation between the two constructs.⁹⁰⁶ Based on regression analysis, BALDAUF/CRAVENS/BINDER

⁹⁰¹ See ESCH (2008), p. 582; ESCH (2006), p. 101.

⁹⁰² See MOOI/SARSTEDT (2011), pp. 28-29; SARSTEDT/WILCZYNSKI (2009), p. 223.

⁹⁰³ See HAIR et al. (2014) pp. 46-48; PETRESCU (2013), pp. 110-114; DIAMANTOPOULOS et al. (2012), pp. 444-446; FUCHS/DIAMANTOPOULOS (2009), pp. 203-206.

⁹⁰⁴ See DAVIS/GOLICIC/MARQUARDT (2009), p. 232.

⁹⁰⁵ See CHEN/SU (2012), p. 65; CHEN/SU/LIN (2011), pp. 1237-1238.

⁹⁰⁶ See JAYAKUMAR/BEJOY (2012), p. 55.

(2003) emphasized significant positive relations between brand awareness and different brand equity outcomes (brand market performance, customer perceived value, purchase intention) in a business-to-business setting.⁹⁰⁷ This is also supported by the work of KIM/HYUN (2011), who concluded that brand awareness is a relevant component of brand equity in a business-to-business software services environment. However, the hypothesized direct positive effects on perceived quality and brand loyalty were not confirmed by the authors.⁹⁰⁸

A direct positive relation between brand awareness and brand equity is also supported from a cognitive perspective. The mere exposure theory suggests for a variety of settings that intense brand name exposure even without any associated information may be sufficient to reduce the level of perceived risk and improve individuals' confidence about approaching a brand, finally resulting in enhanced levels of brand equity.⁹⁰⁹

In contrast to those considerations, TONG/HAWLEY (2009), applying a broad measurement of brand awareness comprising the familiarity with the brand and the ease with which brand-related associations came to mind, did not find a direct positive relationship with overall brand equity in their study.⁹¹⁰ Equivalently, RIOS/RIQUELME (2008) did not confirm brand awareness as a component of overall brand equity in an online business setting. However, the authors found that the construct is positively related to respondents' trust in websites and their value perception.⁹¹¹ GIL/ANDRÉS/SALINAS (2007) did not identify a positive relation between a combined brand awareness with associations construct and overall brand equity, whereas the construct showed a significant positive effect on brand loyalty.⁹¹² BIEDENBACH/BENGTSSON/WINCENT (2011) also questioned the importance of brand awareness for the brand equity enhancement, since in the case of high levels of awareness, the brand equity development might be better captured by brand associations, perceived quality, and brand loyalty.⁹¹³

Obviously, findings on the relation between the brand awareness construct and brand equity do not draw a uniform picture, which might be partially attributable to differences in the study context and measurement models.

Several studies indicate a direct positive relation between brand awareness and overall brand equity. However, especially in business-to-business settings, the importance of the construct as a brand equity dimension is questioned. Considering the particularities of leasing decisions, the role of brand awareness as a direct antecedent of brand equity also seems doubtful in a property setting. For one thing, leasing decisions, usually characterized by a high level of involvement, are mostly based on an extensive search process in which individuals become aware of formerly unknown brands in the relevant market.⁹¹⁴ Thus, the importance of their initial consideration set as the basis of their selection seems

⁹⁰⁷ See BALDAUF/CRAVENS/BINDER (2003), p. 227.

⁹⁰⁸ See KIM/HYUN (2011), p. 433.

⁹⁰⁹ See BAKER (1999), p. 32.

⁹¹⁰ See TONG/HAWLEY (2009), pp. 267-270.

⁹¹¹ See RIOS/RIQUELME (2008), p. 732.

⁹¹² See GIL/ANDRÉS/SALINAS (2007), p. 195.

⁹¹³ See BIEDENBACH/BENGTSSON/WINCENT (2011), p. 1094.

⁹¹⁴ See GERSTNER (2008), pp. 262-263.

questionable. For another, the role of brand awareness as a decision heuristic seems limited in leasing processes as long-term high-involvement settings. As a consequence, and in line with the work of BUIL/MARTÍNEZ/DE CHERNATONY (2013), this study does not assume a direct relation between brand awareness and overall brand equity.⁹¹⁵

Regarding the relation between brand awareness and brand associations, the study findings have been more stable. For instance, in their study on chain restaurants, HYUN/KIM (2011) found a significant positive relation between brand awareness and brand image as well as between brand awareness and perceived quality.⁹¹⁶ Similarly, in a logistics services setting, JUNTUNEN/JUNTUNEN/JUGA (2011) found a significant positive relation of brand awareness with brand associations and brand equity.⁹¹⁷ This finding is also supported by ESCH et al. (2006), who found evidence for the hypotheses that brand awareness relates positively to brand image and current purchase intentions.⁹¹⁸ Equivalently, BUIL/MARTÍNEZ/DE CHERNATONY (2013) and BUIL/DE CHERNATONY/MARTÍNEZ (2013) confirmed a positive relation between brand awareness and perceived value as well as between brand awareness and three facets of brand associations (perceived value, brand personality, organizational associations).⁹¹⁹ In an analysis of local and global food brands on the basis of the Young & Rubicam database Brand Asset Valuator, SCHUILING/KAPFERER (2004) also implied that awareness is positively correlated with several brand image dimensions.⁹²⁰ From a theoretical view, a positive relation between brand awareness and brand associations is also supported by the hierarchy of effects suggested by KELLER (1993). The author stated that brand awareness has an effect on consumers' decision making by influencing the formation and strength of brand associations since the nature of the brand node that is established through brand awareness "(...) should affect how easily different kinds of information can become attached to the brand in memory."⁹²¹ This statement obviously supports a positive effect of brand awareness on the accessibility of brand associations.

However, there is also evidence that there is no direct influence between brand awareness and brand associations. In particular, BIEDENBACH/MARELL's (2010) recent study on high-involvement purchases (auditing services) in a business-to-business context did not identify respective impacts.⁹²²

In contrast to the case of brand equity, the empirical and theoretical support for a direct positive relation between brand awareness and brand associations seems more stable even across different study settings. This seems also reasonable from a real estate perspective, since brand-related associations cannot be formed in individuals' minds without their becoming increasingly aware of a certain property in the course of the leasing-decision process. Moreover, the hierarchy of effects proposed by KELLER (1993) further

⁹¹⁵ See BUIL/MARTÍNEZ/DE CHERNATONY (2013), p. 64.

⁹¹⁶ See HYUN/KIM (2011), p. 434.

⁹¹⁷ See JUNTUNEN/JUNTUNEN/JUGA (2011), p. 307.

⁹¹⁸ See ESCH et al. (2006), p. 103.

⁹¹⁹ See BUIL/DE CHERNATONY/MARTÍNEZ (2013), p. 120; BUIL/MARTÍNEZ/DE CHERNATONY (2013), p. 68.

⁹²⁰ See SCHUILING/KAPFERER (2004), p. 105.

⁹²¹ KELLER (1993), p. 3.

⁹²² See BIEDENBACH/MARELL (2010), p. 453.

supports a positive relation between brand awareness and brand associations. In fact, the author's statement on the influence of brand awareness on the nature of the brand node and the linkages in individuals' memory directly implies that higher levels of brand awareness may lead to an increased accessibility of brand associations.

Altogether, hypothesizing a positive relation between brand awareness and brand associations seems appropriate. Unfortunately, no empirical studies were identified that explicitly examine the individual effects of the construct on accessibility, valence, and uniqueness of brand associations, which are separately considered in this study. However, conceptually, the reviewed studies usually refer to the three facets, and indicators related to accessibility, valence, and uniqueness are frequently included in the measurement models used to capture the brand associations construct. For this reason, a simplifying assumption is made at this point: that the positive relation between the brand awareness construct and the brand associations construct as a whole holds true for associations' accessibility, valence, and uniqueness as well. Against this background, three hypotheses are developed, capturing the likely consequences of brand awareness regarding the facets of brand associations:

H_{AWA1}: Brand Awareness is positively related to Accessibility of Brand Associations.

H_{AWA2}: Brand Awareness is positively related to Valence of Brand Associations.

H_{AWA3}: Brand Awareness is positively related to Uniqueness of Brand Associations.

4.4.3 Brand Familiarity

4.4.3.1 Literature Review: Dimensionality and Measurement Approaches

Altogether, building upon the original definition by ALBA/HUTCHINSON (1987), a general common understanding of brand familiarity has been developed and is regularly modeled as a unidimensional construct. A few authors have suggested that brand familiarity is a multidimensional construct based on the proposition that different kinds of experiences with a brand (e.g., usage, word of mouth, advertising) may form different facets of familiarity with a brand.⁹²³ However, in the field of brand equity research, a unidimensional understanding of the construct seems to dominate in recent publications; in the majority, brand familiarity is operationalized as accumulated purchases, number of brand contacts or usage, ownership, or level of experience with a brand.

For instance, OAKENFULL/MCCARTHY (2010) measured brand familiarity with the help of two indicators capturing respondents' past consumption of the brand in the last six months and their overall familiarity on the basis of a 10-point scale.⁹²⁴ Similarly, KENT/KELLARIS's (2001) measurement was built upon three indicators on a five-point scale ("Before I saw the ads today, I was familiar/unfamiliar, experienced/inexperienced, knowledgeable/not knowledgeable with (brand name)").⁹²⁵ In a cross-category setting covering soft drinks,

⁹²³ See ALBA/HUTCHINSON (1987), p. 438; KORCHIA (2001), pp. 1-2.

⁹²⁴ See OAKENFULL/MCCARTHY (2010), p. 283.

⁹²⁵ See KENT/KELLARIS (2001), p. 165.

toothpaste, athletic shoes, and jeans, NETEMEYER et al. (2004) used a single-item measurement focusing on respondents' overall familiarity ("(Brand name) is a brand of (product category) I am very familiar with"). In a more basic manner, PHELPS/THORSON (1991) asked study participants to indicate on a single bipolar scale whether they were familiar or unfamiliar with the brand.⁹²⁶

While these operationalizations clearly center on the common understanding of the brand familiarity construct, other measurement approaches show overlaps with the constructs of brand awareness and, to a lesser extent, brand associations and perceived quality.

Regarding overlaps with brand associations and perceived quality, for example, BAKER (1999) focused on motor oil and toothpaste brands, measuring overall brand familiarity on a 10-point scale ("very familiar"/"very unfamiliar") including an association ("very appealing"/"very unappealing") and quality perception ("very high"/"very low") facet.⁹²⁷ Similarly, in a website context, HA/PERKS (2005) captured brand familiarity on the basis of indicators related to attitudes and feelings of comfort, which might also be attributed to the brand associations construct in other studies (e.g., "The brand gives me a feeling of goodwill").⁹²⁸ Conversely, BONDESSON (2012) incorporated brand familiarity as a dimension of brand image and applied two indicators related to brand recall ("When I think of packaging, this company comes first to my mind") and the level of brand-related knowledge ("I know what this company stands for and has to offer") as manifest measures.⁹²⁹ PERSSON (2010) also considered brand familiarity as a facet of brand image.

Looking at publications that show overlaps between brand familiarity and brand awareness measures, one case in point is the study by DOYLE/PENTECOST/FUNK (2014) in which they examined the construct in a sport sponsoring context. The authors applied two indicators capturing overall familiarity ("I am very familiar with the brand") and brand recognition ("I can easily recognize the brand"), implying a close proximity between the two constructs.⁹³⁰ On the other hand, several studies utilize indicators related to the concept of brand familiarity in their measurements of brand awareness, which is in line with AAKER's (1996) suggestion of brand awareness levels where brand familiarity is represented by the knowledge level. For instance, TONG/HAWLEY (2009) suggested a measurement of overall brand familiarity ("I am familiar with X") as an indicator for brand awareness.⁹³¹ In the same way, BUIL/DE CHERNATONY/MARTÍNEZ (2013), BUIL/MARTÍNEZ/DE CHERNATONY (2013), JAYAKUMAR/BEJOY (2012), and FAIRCLOTH (2005) also included familiarity facets in their operationalization approaches for the awareness construct.⁹³²

Regarding the measurement mode, all studies that were reviewed applied a reflective measurement model for the brand familiarity construct. Even though the measurement mode was not explicitly stated, the application of confirmatory factor analyses and the wording of the indicators hint at the use of reflective approaches.

⁹²⁶ See PHELPS/THORSON (1991), p. 205.

⁹²⁷ See BAKER (1999), p. 37.

⁹²⁸ See HA/PERKS (2005), p. 449.

⁹²⁹ See BONDESSON (2012), pp. 33-34, 42; PERSSON (2010), p. 1270.

⁹³⁰ See DOYLE/PENTECOST/FUNK (2014), p. 321.

⁹³¹ See TONG/HAWLEY (2009), p. 267.

⁹³² See BUIL/DE CHERNATONY/MARTÍNEZ (2013), p. 120; BUIL/MARTÍNEZ/DE CHERNATONY (2013), p. 72; JAYAKUMAR/BEJOY (2012), p. 53; FAIRCLOTH (2005), p. 5.

In addition to the construct operationalizations that have been discussed so far, several experimental studies have used settings in which participants are confronted with brands that are considered to be familiar in the population and unfamiliar brands that are sometimes invented by the researchers.⁹³³ Since this work is not based on an experimental setting, the applicability of the corresponding measurement and grouping approaches seems limited and is not further considered at this point.

On balance, while there is an accepted common understanding of the concept, brand familiarity measures strongly depend on the focus of the study. Publications aiming to capture higher levels of brand awareness may combine familiarity-related indicators with brand recall and brand recognition facets in order to achieve higher levels of sensitivity. Likewise, contributions examining brand associations in detail may partially incorporate familiarity associations to reflect the extent of brand-related knowledge in their measurement approach.

4.4.3.2 Proposed Dimensionality and Measurement Approach

This study follows the dominant stream of recent publications that suggest brand familiarity to be a unidimensional construct. In this regard, against the background of the obvious overlaps between brand familiarity, brand awareness, brand associations, and perceived quality detected in other studies, the work aims at a clear differentiation of the construct from other brand equity components. For this reason, NETEMEYER et al.'s (2004) operationalization approach is adapted and brand familiarity reflectively measured with the help of a single-item indicator.⁹³⁴

In this regard, overall familiarity, frequently employed by earlier authors, such as DOYLE/PENTECOST/FUNK (2014), OAKENFULL/MCCARTHY (2010), TONG/HAWLEY (2009), KENT/KELLARIS (2001), and BAKER (1999), seems appropriate as an indicator that reflects individuals' level of brand-related knowledge and experiences. Those authors applied this indicator across several industries, product categories, and study settings mainly using 5- to 10-point scales.⁹³⁵ In line with those suggestions, in this study, respondents' *Overall Familiarity (FAM1)* with a property brand is captured on the basis of a self-assessment applying a seven-point scale from 1 "I am unfamiliar with (property brand name)" to 7 "I am very familiar with (property brand name)." The corresponding instruction was as follows:

"Please indicate your level of familiarity with (property brand name) on a scale from 1 'I am unfamiliar with (property brand name)' to 7 'I am very familiar with (property brand name)'."

Table provides an overview of the measurement approach.

Table 22: Overview of Indicator Set – Brand Familiarity

⁹³³ See, for instance, the experimental studies by MIKHAILITCHENKO et al. (2009), BETTMANN/SUJAN (1987).

⁹³⁴ See NETEMEYER et al.'s (2004), pp. 210-214.

⁹³⁵ See DOYLE/PENTECOST/FUNK (2014), p. 321; OAKENFULL/MCCARTHY (2010), p. 283; TONG/HAWLEY (2009), p. 267; KENT/KELLARIS' (2001), p. 165; BAKER (1999), p. 37.

Construct	Name		Description/Instruction	Scaling	Sources
Brand Familiarity	FAM1	Overall Familiarity	"Please indicate your level of familiarity with (property brand name)."	1 "I am unfamiliar with (property brand name)." - 7 "I am very familiar with (property brand name)."	Doyle/Pentecost/Funk (2014), Oakenfull/McCarthy (2010), Tong/Hawley (2009), Kent/Kellaris (2001), Baker (1999)

Source: Own illustration.

Indeed, applying a single-item measure might lead to a reduction in measurement quality.⁹³⁶ Nonetheless, taking into account the recommendations of HAIR et al. (2014), PETRESCU (2013), DIAMANTOPOULOS et al. (2012), and FUCHS/DIAMANTOPOULOS (2009), and in line with the argumentation in the case of brand awareness, the decision seems justifiable for four reasons:⁹³⁷ (1) Including additional measures multiplies the duration and efforts of the survey, which might result in a higher cancelation rate and a lower number of responses. (2) While brand familiarity is assumed to play an important role in building brand equity, the construct is not explicitly in the focus of the study but is considered within the overall brand equity framework, and thus only its general nature is of interest. (3) The conceptual domain of familiarity seems to be sufficiently concrete, and respondents most likely have a common understanding of its meaning. Thus, measurement errors can be assumed to be less prevalent. (4) Unidimensional measurement approaches that focus on brand familiarity usually apply indicators that are basically the same item rephrased in slightly different ways. According to FUCHS/DIAMANTOPOULOS (2009), this high level of item homogeneity reflects potential item redundancy and indicates that a global single-item measure might be appropriate to capture the construct.

4.4.3.3 Development of Hypotheses

A growing number of studies focus on the consequences and effects of brand familiarity, especially in the field of advertising. However, the number of publications explicitly centering on the effects of the construct in a brand equity context seems limited.

In a sports equipment setting, PINA/IVERSEN/MARTÍNEZ (2010) found that brand familiarity is positively related to brand equity outcomes such as individuals' attitude toward brand extensions.⁹³⁸ This result is also in line with an earlier study by LANE/JACOBSON (1995), who indicated that familiar brands show more positive stock market reactions in the case of brand extensions than unfamiliar brands.⁹³⁹ Similarly, in a study across several industries (automotive, entertainment, financial, pharmaceutical, technology), MCCORKINDALE (2008) found a significant positive relation between persons' familiarity with a company and their perceptions of company citizenship, personality, and reputation, irrespective of positive or negative perceptions resulting from familiarity. Moreover, higher levels of familiarity were associated with higher levels of corporate equity as reflected through respondents' willingness to recommend products or investments to others.⁹⁴⁰ This is also support-

⁹³⁶ See MOOI/SARSTEDT (2011), pp. 28-29; SARSTEDT/WILCZYNSKI (2009), p. 223.

⁹³⁷ See HAIR et al. (2014) pp. 46-48; PETRESCU (2013), pp. 110-114; DIAMANTOPOULOS et al. (2012), pp. 444-446; FUCHS/DIAMANTOPOULOS (2009), pp. 203-206.

⁹³⁸ See PINA/IVERSEN/MARTÍNEZ (2010), p. 956.

⁹³⁹ See LANE/JACOBSON (1995), pp. 72-74.

⁹⁴⁰ See MCCORKINDALE (2008), p. 394.

ed by the findings of MACKAY (2001), who identified brand familiarity as a relevant dimension of brand equity in a replication of an earlier study by AGARWAL/RAO (1996).⁹⁴¹ The findings of HA/PERKS (2005) additionally suggest that brand familiarity significantly affects individuals' overall satisfaction with a website as long as they hold favorable brand associations.⁹⁴² In an organizational buying context, HUTTON (1997) demonstrated that the perceived familiarity of a brand has a positive effect on buyers' willingness to pay a price premium, recommend the brand to others, and give it special consideration in buying processes.⁹⁴³

A direct positive effect between brand familiarity and brand equity is also supported from a theoretical perspective. In this regard, PINA/IVERSEN/MARTÍNEZ (2010) pointed out that, due to mere exposure effects, highly familiar brand names may be better liked "simply as a result of more exposure."⁹⁴⁴ The theory suggests that the perceived risk associated with a brand may decrease when individuals are confronted repeatedly with a brand, leading to more favorable brand evaluations. ZIMBARDO/LEIPPE (1991) pointed out that social psychologists have "amassed a great deal of evidence"⁹⁴⁵ concluding that the more exposed individuals are to an object, the more they are prone to like it. This is also in line with habituation effects, suggesting that initial uncertainty or negativity toward an unfamiliar stimulus is successively reduced by repetition.⁹⁴⁶

However, in contrast to these considerations, which suggest a direct positive relation between brand familiarity and brand equity, FAIRCLOTH (2005) found a negative impact of brand familiarity on individuals' willingness to provide resources to nonprofit organizations.⁹⁴⁷

The majority of reviewed publications apparently suggest a positive relation between brand familiarity and overall brand equity, which is also supported by the conceptual work of AAKER (1996) and KELLER (1993), who both considered the concept an important step toward building brand equity. From a real estate perspective, it also seems convincing that higher levels of familiarity with a property, reflecting an increasing number of brand-related experiences and more elaborate knowledge structures, may foster a preference and increased willingness to pay a premium for the subject property. For instance, office tenants familiar with the property in which they are located may – irrespective of the resources needed to change the location – be willing to accept an increase in rents due to their increased level of habituation and reduced perceived risk, even if comparable properties might be available at a lower price. Against this background, it seems appropriate to follow the empirical evidence from other industries and study settings and propose a direct positive relation between brand familiarity and overall brand equity in this study. More formally put, it is hypothesized:

H_{FAM1}: Brand Familiarity is positively related to Overall Brand Equity.

⁹⁴¹ See MACKAY (2001), p. 47. See also the original study by AGARWAL/RAO (1996).

⁹⁴² See HA/PERKS (2005), p. 446.

⁹⁴³ See HUTTON (1997), pp. 433-434.

⁹⁴⁴ See PINA/IVERSEN/MARTÍNEZ (2010), p. 946.

⁹⁴⁵ ZIMBARDO/LEIPPE (1991), p. 171.

⁹⁴⁶ See CAMPBELL/KELLER (2003), p. 294.

⁹⁴⁷ See FAIRCLOTH (2005), p. 9.

Regarding the relation between brand familiarity and brand awareness, KELLER (1993) stated that “greater brand familiarity, through repeated exposures to a brand, should lead to increased consumer ability to recognize and recall the brand.”⁹⁴⁸ This proposition was repeatedly confirmed in empirical studies. In their experimental study, CAMPBELL/KELLER (2003) demonstrated that brand familiarity has a strong effect on brand recall such that familiar brands were significantly better recalled than were unfamiliar brands.⁹⁴⁹ Equivalently, focusing on chocolates in a cross-cultural setting, MIKHAILITCHENKO et al. (2009) found evidence that higher levels of brand familiarity are related to higher levels of brand awareness regarding respondents’ ability to recall brand claims.⁹⁵⁰ This is also confirmed by KENT/KELLARIS (2001), who posited that high levels of prior experience with a brand may result in the retention of stronger advertisement-brand linkages, finally leading to an enhanced recall of familiar brands’ attitudes.⁹⁵¹ Similarly, DELGADO-BALLESTER/NAVARRO/SICILIA (2012) stated that familiar brands can be recognized and identified more easily and come to mind more readily.⁹⁵²

The empirical findings regarding a positive effect of brand familiarity on brand awareness are, clearly, partially in contradiction to the hierarchical levels of brand awareness proposed by AAKER (1996), implying that brand recall represents a lower level of awareness than brand familiarity.⁹⁵³ Nevertheless, from a real estate view, it also seems reasonable that a growing number of experiences with a property brand lead to higher levels of awareness. In fact, individuals engaged in a search process in advance of a leasing decision will successively increase their number of brand-related experiences through advertisements, real estate agent contacts, and site visits, which in turn may result in higher levels of brand awareness in terms of recall. Considering the existing empirical evidence and the plausibility in a real estate context, this study suggests a positive relation between brand familiarity and brand awareness.

H_{FAM2}: Brand Familiarity is positively related to Brand Awareness.

Apart from its influence on brand equity and brand awareness, there is also strong empirical evidence suggesting a positive relation between the construct of brand familiarity and brand associations. In fact, several studies were identified that explicitly relate to one or more of the three association facets that are examined in this work.

Regarding the accessibility of associations in the case of familiar brands, KENT/ALLEN (1994) pointed out that high levels of familiarity reduce the likelihood that brand-related information is confounded with information on competing brands. Based on the associative network model and the accessibility-valence hypothesis, one may expect that exposure to information on competing brands may result in overlapping memory traces, which in turn may inhibit the retrieval of distinctive associations. Familiar brands are less prone to those interferences since their underlying knowledge structures are more stable and well estab-

⁹⁴⁸ See KELLER (1993), p. 10.

⁹⁴⁹ See CAMPBELL/KELLER (2003), pp. 301-302.

⁹⁵⁰ See MIKHAILITCHENKO et al. (2009), p. 936.

⁹⁵¹ See KENT/KELLARIS (2001), pp. 165-166.

⁹⁵² See DELGADO-BALLESTER/NAVARRO/SICILIA's (2012), pp. 1264-1266.

⁹⁵³ See AAKER (1996), pp. 114-115.

lished.⁹⁵⁴ This proposition is also supported by KELLER's (1987) assertion that "(...) greater brand knowledge might produce stronger links in the ad memory trace and (...) improve resistance to competitive interference effects."⁹⁵⁵ Similarly, studies have shown that consumers may have a greater willingness to pay attention to advertisements for familiar brands. As ALBA/HUTCHINSON/LYNCH (1991) stated: "Familiarity guides the consumer's attention to specific brands."⁹⁵⁶ In this respect, CAMPBELL/KELLER (2003) further posited that individuals already possess some knowledge about a familiar brand and are more likely to update their existing knowledge in a less extensive, more confirmatory process.⁹⁵⁷

Looking at the potential relation between familiarity and brand associations' valence, a majority of studies suggest that increasing levels of familiarity also drive the favorability of brand associations. In their study covering the business financial market, BOGOMOLOVA-ROMANIUK (2010) compared the favorability of brand associations between defectors of a brand and individuals that had never bought the brand before. The authors found that respondents who were familiar with a brand held significantly more-favorable associations than the unfamiliar group, even if they had defected from the brand earlier, thus implying that brand familiarity might be positively related to the valence of brand associations.⁹⁵⁸ This is supported by the results of DELGADO-BALLESTER/NAVARRO/SICILIA's (2012) study, which proposes that familiar brands benefit from higher levels of processing fluency, ultimately enjoying cognitive and affective advantages over unfamiliar brands.⁹⁵⁹ ZAJONC/MARKUS (1982), BETTMAN/SUJAN (1987), and PARK (2009) also found evidence for a positive relation between brand familiarity and favorable brand-related attitudes and images.⁹⁶⁰ Focusing on the impact of brand crisis information, DAWAR/LEI (2009) found that familiar brands also benefit from the stability and accessibility of the underlying knowledge structures in situations where individuals are confronted with negative information on the brand. Consumers' direct or indirect experiences with the brand allow them to easily retrieve proattitudinal information, leading to a reduction in the influence of the crisis information and the preservation of a favorable brand image.⁹⁶¹ This notion that the extent and stability of existing knowledge, as reflected by brand familiarity, influences the effects of new information on a brand was also confirmed by DOYLE/PENTECOST/FUNK (2014) in a sports sponsoring setting.⁹⁶² In support of these findings, LAROCHE/KIM/ZHOU (1996) found that higher levels of brand familiarity through accumulated customer experiences fortify individual's confidence about the brand.⁹⁶³ However, CARRILAC/LAFFERTY/HARRIS (2005) hinted at potential drawbacks of brand familiarity, outlining that the higher the familiarity

⁹⁵⁴ See KENT/ALLEN (1994), pp. 97-98.

⁹⁵⁵ KELLER (1987), p. 329.

⁹⁵⁶ ALBA/HUTCHINSON/LYNCH (1991), p. 10.

⁹⁵⁷ See CAMPBELL/KELLER (2003), p. 293.

⁹⁵⁸ See BOGOMOLOVA-ROMANIUK (2010), pp. 1264-1266.

⁹⁵⁹ See DELGADO-BALLESTER/NAVARRO/SICILIA (2012), p. 33.

⁹⁶⁰ See PARK (2009), p. 95; BETTMAN/SUJAN (1987), pp. 147-150; ZAJONC/MARKUS (1982), p. 125-127.

⁹⁶¹ See DAWAR/LEI (2009), p. 511.

⁹⁶² See DOYLE/PENTECOST/FUNK (2014): pp. 313, 318-320.

⁹⁶³ See LAROCHE/KIM/ZHOU (1996), pp. 119-120.

level of a brand, the more difficult it is to change existing brand associations, whether they are positive or negative.⁹⁶⁴

Publications focusing on the relation between brand familiarity and the uniqueness of brand-related associations are scarce. However, OAKENFULL/MCCARTHY (2012) found that higher levels of brand familiarity are associated with a higher proportion of brand-specific associations.⁹⁶⁵

Altogether, a series of studies have provided empirical evidence for the hypothesis that brand familiarity is positively related to brand associations in general and, in particular, to the facets of accessibility, valence, and uniqueness that are captured in this study. Considering the particularities of real estate markets and leasing decisions, there is no strong reason that speaks against these propositions. In fact, increasing levels of familiarity with a property brand based on individuals' accumulated direct and indirect experiences may lead to a higher accessibility of brand associations, to more favorable evaluations due to fluent processing and habituation, and to a greater amount of unique brand-specific knowledge. Consequently, the following three hypotheses are derived:

H_{FAM3}: Brand Familiarity is positively related to Accessibility of Brand Associations.

H_{FAM4}: Brand Familiarity is positively related to Valence of Brand Associations.

H_{FAM5}: Brand Familiarity is positively related to Uniqueness of Brand Associations.

4.4.4 Perceived Quality

4.4.4.1 Literature Review: Dimensionality and Measurement Approaches

In line with the means-end chain model, it seems practicable to differentiate between operationalization approaches on the basis of their level of abstraction. Clearly, some approaches may comprise indicators reflecting different levels; however, a roughly structured overview can be achieved in this way. In this regard, one can distinguish between publications applying a majority of abstract quality facets, such as benefits, personal values, and overall judgments, and studies centering on a majority of product-related attributes, such as physical product characteristics or tangible service characteristics. Measurement approaches based on more abstract quality aspects like benefit or personal value level obviously have the advantage that they can be applied to different study settings, whereas sets of concrete product-related attributes most likely are limited to their specific industry.

Against this background, the transferability of the proposed measurements to a real estate context obviously decreases with lower levels of abstraction. In contrast to the other constructs that are considered in this study, however, the concept of perceived quality has been occasionally examined in property-related publications, especially on lower levels of abstraction, so the development of an appropriate measurement approach can draw from these studies. Nevertheless, it must be stated that respective work in the field of real es-

⁹⁶⁴ See CARRILAC/LAFFERTY/HARRIS (2005), p. 53.

⁹⁶⁵ See OAKENFULL/MCCARTHY (2012), p. 285.

tate is still scarce and in an early stage. Users and their perceptions have traditionally not been in the focus of interest, and approaches to develop objective quality measures have long been dominant.⁹⁶⁶ Moreover, no studies have been identified that examined perceived quality within a brand equity framework.

On a high level of abstraction, YOO/DONTHU (2001) measured perceived quality in their study on athletic shoes, films, and TV sets with the help of six indicators focusing mainly on the overall quality perception. After purification the authors retained two indicators capturing respondents' perception regarding the overall functionality ("The likelihood that X would be functional is very high") and quality of the products ("The likely quality of X is extremely high").⁹⁶⁷ Similarly, in a place brand setting, KEMP/CHILDERS/WILLIAMS (2012) applied three indicators covering variations of individuals' overall quality perception regarding events (e.g., "Austin events are of high quality," "Austin music events are really good") on a seven-point scale from 1 "strongly disagree" to 7 "strongly agree."⁹⁶⁸

AAKER (1996) suggested a more differentiated approach. The author emphasized overall quality, quality compared to competing brands, and consistency of quality as three important facets of perceived quality. Further, Aaker proposed leadership/popularity as a related concept to complement the construct of perceived quality and sharpen its sensitivity regarding market dynamics. The measurement of the construct reflects dominance in the market, growth in popularity, and innovativeness.⁹⁶⁹

AAKER's (1996) approach has been frequently referred to in later publications. For instance, in their study on motorcycles, JAYAKUMAR/BEJOY (2012) captured perceived quality based on brand popularity, brand leadership, innovativeness, esteem, performance, and superiority within the product category.⁹⁷⁰ Equivalently, focusing on brand equity in an automotive setting, LOBSCHAT et al. (2013) considered overall quality, reliability, fulfillment of expectations and needs, and innovativeness with the help of five-point scales anchored from 1 "strongly disagree" to 5 "strongly agree."⁹⁷¹ A similar approach was taken by NETEMEYER et al. (2004), who suggested a combination of perceived quality and perceived value for the cost captured with the help of eight indicators. Obviously, the four indicators reflecting perceived quality also built upon Aaker's suggestion, comprising overall quality, leadership in the product class, consistency, and reliability compared to other brands.⁹⁷²

Employing only the measures from the original perceived quality construct, GIL/ANDRÉS/SALINAS (2007), KIM/HYUN (2011), and HAMEED (2013) relied on three indica-

⁹⁶⁶ See, for instance, the work of BOTTOM/MCGREAL/HEANEY (1999), which focused on quantitative measures of building quality and performance such as floor-to-ceiling height, width of entrances, or percentage of floor space per employee. A different approach was suggested by BAUM (1993), who defined a building's quality in terms of its resistance against depreciation and obsolescence, depending on its external appearance, internal specification, and layout specification. From a portfolio perspective, OLAYONWA/IMAN/ISMAIL (2012) posited that rental prices are appropriate indicators of overall building quality.

⁹⁶⁷ See YOO/DONTHU (2001), p. 14.

⁹⁶⁸ See KEMP/CHILDERS/WILLIAMS (2012), p. 514.

⁹⁶⁹ See AAKER (1996), p. 109.

⁹⁷⁰ See JAYAKUMAR/BEJOY (2012), p. 53.

⁹⁷¹ See LOBSCHAT et al. (2013), p. 143.

⁹⁷² See NETEMEYER et al. (2004), p. 223.

tors covering overall quality, quality compared to other brands (superiority), and trust in the consistency of the product's quality.⁹⁷³ BIEDENBACH/BENGTSSON/WINCENT (2011) and BIEDENBACH/MARELL (2010) also applied a similar indicator set asking respondents to rate their overall quality perception, the consistency of the quality, and the relative superiority of the quality on five-point scales.⁹⁷⁴

PAPPU/QUESTER/COOKSEY (2007) built upon indicators from AAKER (1991) and YOO et al. (2000), broadening the measurement of perceived quality by focusing on overall quality, reliability, excellence of features, durability, and consistency of quality.⁹⁷⁵ BUIL/MARTINEZ/DE CHERNATONY (2013) and BUIL/DECHERNATONY/MARTÍNEZ (2013) partially adopted this approach in their studies on sportswear, consumer electronics, and cars. The authors measured perceived quality on the basis of respondents' overall quality perception, the perceived consistency of the products' quality, the quality's reliability, and the excellence of the product features.⁹⁷⁶ Similarly, TONG/HAWLEY (2009) applied an overall assessment of perceived quality based on three indicators focusing on trust in the quality of products from the brand, overall quality perception, and excellence of product features.⁹⁷⁷

Several publications rely on a combination of highly abstract and partially more industry- or product-related attributes and quality dimensions to capture respondents' quality perception. One is the study by VAN RIEL/DE MORTANGES/STREUKENS (2005) that centered on a business-to-business setting in the chemical industry. The authors examined three high-level indicators covering overall quality ("Product X is a high-quality product"), dependability and consistency ("Product X is a dependable and consistent product"), and innovation ("Product X is an innovative product"), and added as a fourth factor development lead time ("Product X development lead time is excellent"), which is derived from the particularities of the business sector.⁹⁷⁸ In a similar context, ULAGA/CHACOUR (2001) divided the construct into product-related, service-related, and product-related quality in order to capture attributes that are relevant for customers' judgment on chemical suppliers in the food industry.⁹⁷⁹ CHEN/SU (2012) and CHEN/SU/LIN (2011) investigated quality perceptions in the fastener industry, stating that perceived quality builds upon tangible attributes of the product such as product quality, and intangible attributes such as service quality. The authors split perceived quality into product quality and service quality, postulating that service quality is of particular importance in a business-to-business setting. However, service quality did not show a significant relation with brand equity in their study. The product quality construct comprised indicators for overall quality, development lead time, consistency, and innovativeness, which were identified as relevant attributes in the industry. Service quality was measured in terms of production support and development support.⁹⁸⁰ In a hospitality context, KWUN (2010) also suggested a split between product and service

⁹⁷³ See HAMEED (2013), p. 190; KIM/HYUN (2011), p. 432; GIL/ANDRÉS/SALINAS (2007), p. 193.

⁹⁷⁴ See BIEDENBACH/BENGTSSON/WINCENT (2011), p. 1101; BIEDENBACH/MARELL (2010), p. 452.

⁹⁷⁵ See PAPPU/QUESTER/COOKSEY (2007), p. 741.

⁹⁷⁶ See BUIL/DECHERNATONY/MARTÍNEZ (2013), p. 120; BUIL/MARTÍNEZ/DE CHERNATONY (2013), p. 72.

⁹⁷⁷ See TONG/HAWLEY (2009), p. 267.

⁹⁷⁸ See VAN RIEL/DE MORTANGES/STREUKENS (2005), p. 844.

⁹⁷⁹ See ULAGA/CHACOUR (2001), p. 534.

⁹⁸⁰ See CHEN/SU (2012), p. 60; CHEN/SU/LIN (2011), p. 1235.

quality to reflect the characteristics of hotel brands. Nevertheless, the author applied an indicator set focusing on overall quality, superiority, and favorability at an abstract level.⁹⁸¹ For their study in the tile reseller industry, BALDAUF/CRAVENS/BINDER (2003) also combined highly abstract quality facets with a more product-oriented measurement. The authors adapted indicators capturing overall quality perception, functionality, reliability, dependability, and durability and included workmanship as a product-specific representation of quality.⁹⁸² In a consumer electronics and cosmetics setting, WANG/WEI/YU (2008) also applied a set of abstract and more concrete quality aspects. On the basis of an interview series, they derived a set of six indicators comprising perceived value, stability and reliability, comfort, upgrade capability, style, and variety.⁹⁸³

On a low level of abstraction, several publications examining perceived quality in a property context are available. CLARK/KEARNS (2012) investigated effects of housing quality improvements on psychosocial comfort. The authors suggested four dimensions of perceived quality covering external/structural quality (e.g., state of repair, external appearance), security (e.g., front door, windows), warmth/energy efficiency (e.g., heating system, insulation, dampness), and internal quality (e.g., overall space, interior state of repair, internal layout, internal decoration) measured on five-point Likert scales.⁹⁸⁴ HO/NEWELL/WALKER (2005) carried out a survey focusing on the quality perception of Australian office tenants. Their findings indicate that functionality (e.g., floor size, ceiling height, space efficiency), services (e.g., bathroom facilities, work environment, IT services), access and circulation (e.g., way finding, lifts, parking), presentation (e.g., external façade, entrance and foyer, finishes specification), management (e.g., security and access control, maintenance, cleaning services), and amenities (e.g., garden or courtyard, infrastructure) are the order of importance in assessing office building quality.⁹⁸⁵ BRADE (1998) aimed to investigate the relationship between office tenants' quality perception and their willingness to renew their lease contract. The author distinguished between material (building-related) and immaterial (service-related) aspects and employed an indicator set comprising a total of 38 building attributes. The indicator set covered location (e.g., shopping facilities, restaurants, accessibility), flexibility (e.g., adaptability of space), fixtures and fittings (e.g., sun protection, elevators, bathrooms, kitchens), functionality (e.g., appropriateness, convenience), services (e.g., contract management, concierge, security), and visual appearance (e.g., architecture, interior design, prestige, exclusivity). The results indicated that building-related quality aspects are a main driver of tenants' willingness to renew their lease contract, whereas service-related aspects play only a minor role.⁹⁸⁶

Across publications from different industries and across abstraction levels, there seems to be wide agreement that perceived quality is a multidimensional construct comprising a number of aspects that are individually assessed and accumulated by individuals to form their subjective quality judgments.⁹⁸⁷ Therefore, a majority of researchers strive to develop

⁹⁸¹ See KWUN (2010), p. 187.

⁹⁸² See BALDAUF/CRAVENS/BINDER (2003), p. 227.

⁹⁸³ See WANG/WEI/YU (2008), p. 310.

⁹⁸⁴ See CLARK/KEARNS (2012), p. 923.

⁹⁸⁵ See HO/NEWELL/WALKER (2005), p. 428.

⁹⁸⁶ See BRADE (1998), pp. 220-231.

⁹⁸⁷ See ANSELMSSON/JOHANSSON/PERSSON (2007), p. 403.

measurements that capture all major aspects of the construct domain. However, in most studies, analysis methods and path model illustrations indicate a reflective measurement mode for the perceived quality construct, thus trying to maximize the conceptual overlap between interchangeable indicators.⁹⁸⁸ In fact, in some cases – especially on lower levels of abstraction, where a variety of distinct product characteristics are considered – it may be argued whether substantial collinearity can be assumed between the quality aspects. Rather, when conceptually different facets of perceived quality are in the focus of interest, it might be reasonable to assume a trade-off between the dimensions, suggesting a formative measurement of the construct.⁹⁸⁹

4.4.4.2 Proposed Dimensionality and Measurement Approach

Looking at the reviewed publications, this study follows the common understanding of perceived quality as a multidimensional construct. With regard to the means-end model, capturing perceived quality at an abstract level and focusing on benefits and personal values seems inappropriate to derive meaningful recommendations for real estate practitioners regarding the drivers underlying tenants' quality perception. On the contrary, in accordance with the advice of ANSELMSSON/JOHANSSON/PERSSON (2007), it seems reasonable to concentrate on lower levels of abstraction and to rely on a set of property-specific quality criteria that are considered by individuals when forming their quality judgments.⁹⁹⁰ The limited transferability of the resulting indicator set is acceptable as the brand equity model is explicitly developed for an office property context.

With regard to the limited number of studies that explicitly center on perceived quality in a property, it seems appropriate at this point to additionally take into account property-related publications that examine potentially relevant building characteristics from a development or user requirements perspective.

ERTLE-STRAUB (2002) referred to relevant building characteristics from a development view. The author enlisted potential elements of building design and differentiated between location (plot layout, geologic characteristics, infrastructure, image, parking), functionality (accessibility, paths and roads, relation between usable and total area), architecture (design, materials, equipment standards), environment (outdoor facilities, green areas, supply infrastructure), flexibility (variability of spatial structures, flexible floor layout, adaptability of technical equipment), service concept (lease management, sales management, facility management, consulting), contract guarantees (lease guarantees, completion guarantees), and day-to-day management (security management, operating and marketing con-

⁹⁸⁸ See HAIR et al. (2014), p. 44.

⁹⁸⁹ In literature, the discussion on approaches to measure quality perceptions is ongoing, and there are a variety of established reflective and formative models of the construct that differ in their assumptions regarding the relationship between the latent construct, its subdimensions, and manifest variables. In this regard, MARTÍNEZ/MARTÍNEZ (2010) provided a detailed discussion of the topic in a service quality context. For a discussion of formative and reflective measurement approaches in related settings, see also the work of LIN/SHER/SHIH (2005), focusing on customer perceived value, and RUIZ et al. (2008), who investigated the customer value construct in a services environment.

⁹⁹⁰ In a grocery setting, ANSELMSSON/JOHANSSON/PERSSON (2007) argued that measures of perceived quality in the context of brand equity should "by all means" include product-specific components. See ANSELMSSON/JOHANSSON/PERSSON (2007), p. 403.

cept).⁹⁹¹ Similarly, in a study carried out by PSEPHOS (2004) for DeTelmobilien, the author examined the most important office space requirements of German small and medium-sized companies, identifying IT infrastructure, rental price, atmosphere, infrastructure, accessibility, external appearance, and flexibility.⁹⁹² In a case study, THOMAS (2010) investigated office tenants' general perception of a building as a working space, applying a set of indicators covering temperature, ventilation and air quality, lighting and access to views, noise, privacy and office layout, perceived health, personal control, and speed of management response, as well as overall comfort and perceived productivity.⁹⁹³ The key criteria for relocations were examined by ABEL (1994), who found lease price, accessibility, prestige, parking facilities, flexibility of space, and functionality of working space as main influencing factors.⁹⁹⁴

Altogether, it becomes apparent that due to the substantial complexity of properties, perceived building quality is a highly complex construct as well. With regard to the granularity of potentially relevant attributes, it seems necessary to focus on a medium level of abstraction that strikes a balance between the desired parsimony of the questionnaire and the possibility to derive differentiated recommendations for real estate practice.

Regarding the measurement mode, a formative approach to measuring perceived quality seems appropriate. Following the widely accepted assumption that persons form their overall quality perceptions on the basis of an assessment of individual attributes, it seems reasonable that there are trade-offs between the different quality facets of a property. The perceived quality of an office building regarding its architectural design may be high, whereas the same property might suffer from a low perceived quality of its location. A formative measurement mode for the perceived quality construct has also been applied by other authors in several industry settings. For instance, COLLIER/BIENSTOCK (2006) suggested a formative measurement model for service quality in an e-retailing context. Equivalently, MOLINA-CASTILLO et al. (2013) measured product quality across four industries (chemicals, machinery, electronics, transportation) in a formative mode.⁹⁹⁵ VÖLCKNER et al. (2010) also tested a formative approach to measuring service quality covering financial, cultural, telecommunication, catering, and hospitality services.⁹⁹⁶ Moreover, formative measurements are the basis for established service quality models, such as SERVQUAL and SERVPERF, that consider quality as an aggregate of its dimensions.⁹⁹⁷ In line with these approaches, this study refers to perceived quality as a formative index.

Against this background, the property-oriented measurement of perceived quality in this study mainly draws from the work of BRADE (1998) and ERTLE-STRAUB (2002), focusing on the comprehensive quality facets suggested in a similar manner by both authors and also partially reflected in the work of PSEPHOS (2004), HO/NEWELL/WALKER (2005), and THOMAS (2010): (1) *Visual Appearance* (QAL1), referring to the architectural design, aesthetics, and overall appeal of a property; (2) *Equipment* (QAL2), comprising all fixtures, fittings,

⁹⁹¹ See ERTLE-STRAUB (2002), p. 81.

⁹⁹² See PSEPHOS (2004), pp. 8-13.

⁹⁹³ See THOMAS (2010), p. 616.

⁹⁹⁴ See ABEL (1994), p. 28.

⁹⁹⁵ See MOLINA-CASTILLO et al. (2013), p. 393; COLLIER/BIENSTOCK (2006), pp. 268-269.

⁹⁹⁶ See VÖLCKNER et al. (2010), pp. 381-384.

⁹⁹⁷ See MARTÍNEZ/MARTÍNEZ (2010), pp. 34-38.

furnishings, and facilities of the property, such as sun protection, bathrooms, and kitchens; (3) *Flexibility* (QAL3), related to the possibility to adapt a property according to varying needs, especially regarding spatial structures and technical equipment; (4) *Functionality* (QAL4), describing the adequacy and convenience of the property to efficiently meet the work-related requirements of its occupiers and support their productivity; (5) *Location* (QAL5), depicting the conditions of the property's micro and macro surroundings in terms of plot layout, infrastructure, accessibility, neighborhood, and other relevant aspects determining the locational circumstances; and (6) *Service Offer* (QAL6), denoting the provision of additional services for occupiers, such as reception, concierge, or relocation services.

In order to limit respondents' efforts when participating in the study, the measurement relies on an overall assessment of the perceived quality in these dimensions, and no further differentiation into more granular items is applied. Therefore, this study follows the understanding of perceived quality as a multifaceted construct and applies a measurement model in which each of the six quality facets is reflected by a single item.

In addition to the six items, *Overall Perceived Quality* (QAL7) is captured as an overall reflective indicator of respondents' quality perception. In this way, a later assessment of the formative construct's external validity can be conducted.⁹⁹⁸

In the course of the survey, respondents were asked to rate their agreement with extreme statements regarding the facets of perceived quality on a seven-point scale. The full instruction was:

"Please rate the following statements as how strongly you agree or disagree on a scale from 1 'very strongly disagree' to 7 'very strongly agree'."

In order to establish a common understanding of the items in line with the descriptions above, respondents were provided a short definition of their meaning in advance of the respective ratings. For instance:

"A property's location refers to the conditions of the property's micro- and macrosurroundings in terms of plot layout, infrastructure, accessibility, neighborhood, and other relevant aspects determining the locational circumstances."

Afterward, the statement was presented in the following form:

"Compared to other office buildings in Germany, (brand name)'s (indicator name) is of excellent quality."

Table summarizes the measurement model for the perceived quality construct.

Table 23: Overview of Indicator Set – Perceived Quality

⁹⁹⁸ See HAIR et al. (2014), pp. 121-122.

Construct	Name	Description/Instruction	Scaling	Sources
Perceived Quality	QAL1	Visual Appearance	"Compared to other office buildings in Germany (property brand name)'s visual appearance is of excellent quality."	Thomas (2010), Ho/Newell/Walker (2005), Psephos (2004), Ertle-Straub (2002), Brade (1998)
	QAL2	Equipment	"Compared to other office buildings in Germany (property brand name)'s equipment is of excellent quality."	
	QAL3	Flexibility	"Compared to other office buildings in Germany (property brand name)'s flexibility is of excellent quality."	
	QAL4	Functionality	"Compared to other office buildings in Germany (property brand name)'s functionality is of excellent quality."	
	QAL5	Location	"Compared to other office buildings in Germany (property brand name)'s location is of excellent quality."	
	QAL6	Service Offer	"Compared to other office buildings in Germany (property brand name)'s service offer is of excellent quality."	
	QAL7	Overall Perceived Quality	"Compared to other office buildings in Germany (property brand name) is of excellent quality."	

Source: Own illustration.

4.4.4.3 Development of Hypotheses

While objective quality does not necessarily contribute to brand equity, the behavioral relevance of perceived quality as a core facet of brand equity has been widely established.⁹⁹⁹ According to AAKER (1991), a high level of perceived quality in comparison to competitors promises direct positive effects concerning customers' brand-specific response: an increased willingness to pay a price premium, an enhanced likelihood to recommend the brand, and an improvement of the brand's overall desirability. In addition, perceived quality facilitates brand extensions when using the brand name to enter into new markets.¹⁰⁰⁰

A positive relation between perceived quality and brand equity has been confirmed by numerous publications across industries and study settings. For instance, YOO/DONTHU (2001) found support for perceived quality as a core dimension of brand equity across three product categories (athletic shoes, film, TV sets).¹⁰⁰¹ Focusing on the consumer electronics and automotive industry, PAPPU/QUESTER/COOKSEY (2007) also emphasized the importance of the construct within the brand equity framework.¹⁰⁰² A direct positive relation between perceived quality and overall brand equity was also found by BUIL/DECHERNATONY/MARTÍNEZ (2013) in their study on the effectiveness of advertisement and sales promotions across products from the sportswear, consumer electronics, and automotive sectors, and by JAYAKUMAR/BEJOY (2012), who centered on brand equity in the motorbike category.¹⁰⁰³ Across four product categories (soft drinks, toothpaste, athletic shoes, jeans) NETEMEYER et al. (2004) developed a brand equity model applying a combined construct covering perceived quality and perceived value for the cost. The author

⁹⁹⁹ See WANG/WEI/YU (2008), p. 311; ANSELMSSON/JOHANSSON/PERSSON (2007), p. 403; PAPPU/QUESTER/COOKSEY (2005), p. 145; MYERS (2003), p. 41.

¹⁰⁰⁰ See AAKER (1991), pp. 86-88.

¹⁰⁰¹ See YOO/DONTHU (2001), p. 9-11.

¹⁰⁰² See PAPPU/QUESTER/COOKSEY (2007), p. 733.

¹⁰⁰³ See BUIL/DECHERNATONY/MARTÍNEZ (2013), p. 68; JAYAKUMAR/BEJOY (2012), p. 53.

also found a positive effect of the construct on customers' willingness to pay a price premium.¹⁰⁰⁴ Similarly, looking at brand extensibility and price flexibility as two brand equity outcomes in the cosmetics and consumer electronics industries, WANG/WEI/YU (2008) found a positive effect of perceived quality on the two constructs.¹⁰⁰⁵

The relevance of perceived quality in building brand equity has also been highlighted repeatedly in business-to-business settings. Empirical evidence for a direct positive relation between the construct and overall brand equity was provided, for instance, by VAN RIEL/DE MORTANGES/STREUKENS (2005), who examined the marketing antecedents of brand equity in the chemicals industry.¹⁰⁰⁶ This finding is supported by KIM/HYUN (2011), who focused on the effectiveness of marketing activities in the IT software industry and also confirmed a positive relation between the two constructs.¹⁰⁰⁷ Equivalently, other authors have found that perceived quality has a significant positive effect on several outcomes of brand equity. The results in BALDAUF/CRAVENS/BINDER's (2003) work on brand equity management in the tile reseller sector indicate a significant positive relation with a brand's profitability and market performance.¹⁰⁰⁸ This is supported by YASEEN et al. (2011), who focused on resellers in a retail environment and identified a positive effect of customers' quality perceptions on a brand's profitability.¹⁰⁰⁹ In a courier services setting, RAUYRUEN/MILLER (2007) found evidence that higher levels of perceived service quality are associated with a higher purchase intention of business customers.¹⁰¹⁰

In contrast to the majority of studies, which have confirmed perceived quality as a core facet of brand equity, several publications did not identify a significant positive effect of the construct. For instance, in their study on building brand equity in the fastener industry, CHEN/SU (2012) identified only perceived product quality as a direct antecedent of brand equity, whereas their corresponding hypothesis regarding perceived service quality was not confirmed.¹⁰¹¹ Focusing on the quality perception of nondurable products (milk, toothpaste, olive oil), GIL/ANDRÉS/SALINAS (2007) also did not confirm their proposition of a positive relation between the construct and overall brand equity and concluded that perceived quality might not be sufficient to establish brand equity.¹⁰¹² This statement is also supported by the results of TONG/HAWLEY (2009), who did not find a statistically significant relation between perceived quality and overall brand equity in a sportswear setting.¹⁰¹³

The last mentioned publications demonstrated that perceived quality as an argument might not be strong enough to establish brand equity in all cases. Nevertheless, considering the dominant empirical support from studies across different industries and study settings, it seems reasonable to assume that tenants' quality perception is positively related to a property brand's overall brand equity. In fact, when individuals hold favorable perceptions of a property's quality compared to competing buildings, it seems probable that they

¹⁰⁰⁴ See NETEMEYER et al. (2004), p. 222.

¹⁰⁰⁵ See WANG/WEI/YU (2008), p. 311.

¹⁰⁰⁶ See VAN RIEL/DE MORTANGES/STREUKENS (2005), p. 845.

¹⁰⁰⁷ See KIM/HYUN (2011), p. 433.

¹⁰⁰⁸ See BALDAUF/CRAVENS/BINDER (2003), p. 232.

¹⁰⁰⁹ See YASEEN et al. (2011), p. 836.

¹⁰¹⁰ See RAUYRUEN/MILLER (2007), p. 27.

¹⁰¹¹ See CHEN/SU (2012), p. 64.

¹⁰¹² See GIL/ANDRÉS/SALINAS (2007), p. 196.

¹⁰¹³ See TONG/HAWLEY (2009), p. 267.

generally prefer the brand over its competitors, are enthusiastic regarding a tenancy, and are more likely to consider the property to provide good value for the cost. Correspondingly, the following hypothesis is derived:

H_{QAL1}: Perceived Quality is positively related to Overall Brand Equity.

Besides its role as a direct antecedent of brand equity, a broad range of studies have examined the relation between perceived quality and brand loyalty in different contexts.

In their study on brand equity dimensions in the chain restaurant industry, HYUN/KIM (2011) detected a positive effect of perceived quality on brand loyalty.¹⁰¹⁴ A similar result was achieved by JAHANGIR et al. (2009) in their examination of factors influencing customers' attitude toward soft drink brand extensions.¹⁰¹⁵ In an investigation of the brand equity construct in the automotive industry, LOBSCHAT et al. (2013) also found a positive relation with customers' loyalty toward a brand.¹⁰¹⁶ HAMEED (2013) considered perceived quality as a mediator between hypermarkets' advertising activities and brand loyalty and confirmed the construct as a direct antecedent of customers' future purchase intention and willingness to recommend the market to others.¹⁰¹⁷ Similarly, in their study on cosmetics and electronic products, WANG/WEI/YU (2008) found evidence that perceived quality has a positive relation to brand resonance, which shows a broad overlap with the concept of brand loyalty.¹⁰¹⁸

The importance of perceived quality is also emphasized in business-to-business settings. For instance, the work of BIEDENBACH/BENGTTSSON/WINCENT (2011) and BIEDENBACH/MARELL (2010) has indicated that higher perceived quality levels of auditing services are associated with higher levels of brand loyalty toward the auditor.¹⁰¹⁹ KIM/HYUN (2011) found a positive relation between perceived quality and brand loyalty in their examination of brand equity in an IT software context.¹⁰²⁰ Those findings are also supported by the work of RAUYRUEN/MILLER (2007) and RAUYRUEN/MILLER/GROTH (2007) centering on courier services, BONDESSON (2012) in a packaging services setting, and MICHELL/KING/REAST (2001), who identified perceived quality as the primary driver of brand loyalty across several industries.¹⁰²¹

From a theoretical perspective, the hierarchy-of-effects theory suggested by LAVIDGE/STEINER (1961) also provides a supportive framework for this predominant empirical evidence. Following an understanding of brand equity building as a learning process, individuals will successively develop favorable attitudes toward a brand, which in turn will lead to attitudinal brand loyalty.¹⁰²² The assumption of a positive relation between perceived quality and brand loyalty is also in line with the cognitive-affective-conative loyalty framework suggested by OLIVER (1999) and described in section **Fehler! Verweisquelle**

¹⁰¹⁴ See HYUN/KIM (2011), p. 434.

¹⁰¹⁵ See JAHANGIR et al. (2009), pp. 26-29.

¹⁰¹⁶ See LOBSCHAT et al. (2013), p. 138.

¹⁰¹⁷ See HAMEED (2013), p. 187.

¹⁰¹⁸ See WANG/WEI/YU (2008), p. 311.

¹⁰¹⁹ See BIEDENBACH/BENGTTSSON/WINCENT (2011), p. 1098; BIEDENBACH/MARELL (2010), p. 453.

¹⁰²⁰ See KIM/HYUN (2011), p. 433.

¹⁰²¹ See BONDESSON (2012); pp. 35-38; RAUYRUEN/MILLER (2007), p. 27; RAUYRUEN/MILLER/GROTH (2009), p. 182; MICHELL/KING/REAST (2001), p. 422.

¹⁰²² See KIM/HYUN (2011), p. 427.

konnte nicht gefunden werden. as well. According to the model, perceived quality as a cognitive belief has an influence on individuals' affective response, which is followed by conative responses such as brand loyalty.

In contrast to the general empirical and theoretical support, not all publications in this field have found a positive relation between perceived quality and brand loyalty. One case in point is a study in the nondurable consumer goods segment by GIL/ANDRÉS/SALINAS (2007) that did not confirm the authors' initial hypothesis that perceived quality is a direct antecedent of brand loyalty.¹⁰²³ Similarly, the results of BUIL/MARTÍNEZ/DE CHERNATONY (2013) and BUIL/DECHERNATONY/MARTÍNEZ (2013) stood against their original hypotheses. In the studies, which both covered data from the consumer electronics, sportswear, and automotive sector, the authors identified a negative relation between perceived quality and brand loyalty and concluded that quality is not a guarantee for brand success.¹⁰²⁴

Taking into account the mainly supportive empirical evidence from other industries and the theoretical framework, it seems appropriate to assume a positive relation between perceived quality and brand loyalty in a real estate context. In fact, the development of attitudinal – and ultimately behavioral – loyalty toward a property seems reasonable only when individuals hold strong and favorable attitudes toward a property brand based on the notion that the office property has superior abilities in fulfilling their needs compared to other properties. In line with the findings of BRADE (1998), it seems appropriate to assume that tenants' quality perception of the building relative to potential alternatives is a main influencing factor regarding their willingness to renew their lease contract.¹⁰²⁵ In light of the considerations above, the following hypothesis is developed for this study:

H_{QAL2}: Perceived Quality is positively related to Brand Loyalty.

Brand trust is also frequently examined as a potential consequence of perceived quality, and empirical findings indicate a positive relation between the two constructs. For example, centering on a services setting, DONEY/BARRY/ABRATT (2007) found a significant positive relationship between customers' overall quality perception and their trust in the brand.¹⁰²⁶ This result is supported by the study of CHIOU/DROGE/HANVANICH (2002), which proved a significant positive relation between perceived company and employee quality and the brand trust construct in a financial services setting.¹⁰²⁷ Equivalently, SICHTMANN (2007) identified competence, reflecting the basis for providing high-quality products, as the primary antecedent of customers' trust in mobile phone brands, and CHINOMONA/MAHLANGU/POOE (2013), focusing on nondurable consumer goods, found a positive indirect effect of perceived service quality through satisfaction on brand trust.¹⁰²⁸

Theories such as the hierarchy-of-effects model proposed by LAVIDGE/STEINER (1961) and the cognitive-affective-conative loyalty framework developed by OLIVER (1997) again contribute to the understanding of the empirical evidence and provide support for a positive

¹⁰²³ See GIL/ANDRÉS/SALINAS (2007), p. 196.

¹⁰²⁴ See BUIL/DECHERNATONY/MARTÍNEZ (2013), p. 121; BUIL/MARTÍNEZ/DE CHERNATONY (2013), p. 68.

¹⁰²⁵ See BRADE (1998), pp. 220-231.

¹⁰²⁶ See DONEY/BARRY/ABRATT (2007), pp. 1108-1109.

¹⁰²⁷ See CHIOU/DROGE/HANVANICH (2002), p. 121.

¹⁰²⁸ See CHINOMONA/MAHLANGU/POOE (2013), pp. 187-188; SICHTMANN (2007), p. 1008.

relation between perceived quality and brand trust. From this perspective, brand trust is reflected by individuals' affective response, which is influenced by their cognitive belief in the quality of the brand. In this regard, CHIOU/DROGE/HANVANICH (2002) stated that "if customers perceive (...) quality favorably, they will have more confidence in the provider, which in turn will increase their trust (...)." ¹⁰²⁹ Thus, continually achieving and exceeding expected performance may act as an indicator that a brand can be relied upon to perform well in the future.

From a real estate perspective, the considerations above allow for the proposition that perceived quality is positively related to brand trust. Indeed, it seems reasonable to assume that individuals evaluate a building's performance as a cue on which they build their confidence that the building will consistently fulfill their needs in the future. Ultimately, quality perceptions of property-related services and the property itself might guide the successive development of trust regarding the people behind the property. Against this background, the following hypothesis is derived:

H_{QAL3}: Perceived Quality is positively related to Brand Trust.

4.4.5 Brand Trust

4.4.5.1 Literature Review: Dimensionality and Measurement Approaches

While there exists a common intuitive understanding of trust, publications in the field of brand equity do not show a consensus regarding the dimensionality and measurements to capture the construct. Unidimensional as well as multidimensional approaches are applied. ¹⁰³⁰

Regarding unidimensional approaches, for instance, MORGAN/HUNT (1994) referred to LARZELERE/HUTSON's (1980) one-dimensional measurement scale. The approach identifies honesty and benevolence as two conceptually distinct dimensions that are nevertheless considered to be operationally inseparable. ¹⁰³¹ Consequently, the authors applied a first-order-only reflective measurement model comprising nine indicators. Similarly, DONEY/CANNON (1997) identified credibility and benevolence as two conceptually different dimensions of brand trust but found that both facets are highly correlated. As a result, the authors proposed that trust is a unidimensional construct, even if the indicator set may comprise items reflecting both credibility and benevolence.

CHAUDHURI/HOLBROOK (2001) suggested a unidimensional approach to measuring brand trust. The authors applied a set of four indicators based on seven-point ratings of agreement (1 "very strongly disagree" to 7 "very strongly agree") with the following statements: "I trust this brand," "I rely on this brand," "This is an honest brand," and "This brand is safe." ¹⁰³² The same measurement approach was also applied by GEÇTI/ZENGİN (2013) in their study on athletic shoes focusing on overall brand trust, honesty, and safety using a

¹⁰²⁹ CHIOU/DROGE/HANVANICH (2002), p. 115.

¹⁰³⁰ See LI et al. (2008), p. 817.

¹⁰³¹ See MORGAN/HUNT (1994), p. 28; LARZELERE/HUTSON (1980), p. 596.

¹⁰³² See CHAUDHURI/HOLBROOK (2001), p. 87.

five-point agreement scale.¹⁰³³ Similarly, in a study on athletic shoes and chocolates, ESCH et al. (2006) used a reduced set of statements covering reliability and overall brand trust on five-point scales.¹⁰³⁴ In an employer brand context, HUBER/WEIHRAUCH/WEINDEL (2012) also applied a unidimensional reflective measurement approach that captures employees' overall brand trust. For this purpose, the authors adapted an indicator set suggested by MACMILLAN et al. (2005) and retained four indicators after purification.¹⁰³⁵ A unidimensional understanding of brand trust was also maintained by LASSAR/MITTAL/SHARMA (1995) in a study across three product categories (television monitors, telephone answering machines, athletic shoes). The authors considered trustworthiness as a separate dimension of brand equity, captured with the help of three semantically similar statements (e.g., "I consider the company and the people who stand behind these televisions to be very trustworthy") on seven-point agreement scales from 1 "strongly disagree" to 7 "strongly agree."¹⁰³⁶ Focusing on telecommunication service providers in a business-to-business setting, RAMASESHAN/RABBANEE/HUI (2013) also relied on a unidimensional approach to measuring brand trust and suggested eight indicators reflecting respondents' overall trust in the brand.¹⁰³⁷ Similarly, centering on the factors influencing shopping center tenants' willingness to renew their service contract, ROBERTS/MERRILEES (2007) applied a set of seven statements (e.g., "I personally trust centre management") to capture the domain of the brand trust construct.¹⁰³⁸

While multiple-item measurements dominate unidimensional concepts of brand trust, some researchers have criticized these approaches and relied on a single-item global measure for the construct. For instance, in a business-to-business setting in the food industry, SELNES (1998) applied a single-item measurement asking respondents to what degree they trust in a supplier. The author argued that the construct is unidimensional and directly accessible for the respondents. Further, Selnes stated that multi-item scales, such as the scale suggested by MORGAN/HUNT (1994), are questionable since they frequently use sources of trust (e.g., reliability, integrity, and confidence) as a measure of trust.¹⁰³⁹ This argument is also supported by MICHELL/REAST/LYNCH (1998), who examined 22 sources of trust as independent variables (e.g., integrity, sincerity, reliability), whereas brand trust was considered as the dependent variable and measured based on a single global item.¹⁰⁴⁰

Multidimensional, and in particular two-dimensional, approaches to operationalizing brand trust are also frequently used in publications. DELGADO-BALLESTER/MUNUERA-ALEMAN (2005), for example, have argued that a unidimensional conceptualization may ignore the motivational aspects associated with the concept, thus limiting the conceptual richness of the phenomenon.¹⁰⁴¹ The authors therefore included reliability (referring to the ability and willingness to keep promises and satisfy customers' needs) and intentions (denoting the

¹⁰³³ See GEÇTİ/ZENGİN (2013), p. 114.

¹⁰³⁴ See ESCH et al. (2006), p. 102.

¹⁰³⁵ See HUBER/WEIHRAUCH/WEINDEL (2012), pp. 57-58; MACMILLAN et al. (2005), p. 813.

¹⁰³⁶ See LASSAR/MITTAL/SHARMA (1995), p. 16.

¹⁰³⁷ See RAMASESHAN/RABBANEE/HUI (2013), p. 340.

¹⁰³⁸ See ROBERTS/MERRILEES (2007), p. 413.

¹⁰³⁹ See SELNES (1998), p. 312.

¹⁰⁴⁰ See MICHELL/REAST/LYNCH (1998), p. 162.

¹⁰⁴¹ See DELGADO-BALLESTER/MUNUERA-ALEMAN (2005), p. 188.

attribution of good intentions to the brand regarding customers' interest and welfare) in their scale. Each dimension was considered as a separate construct and measured on the basis of four indicators. Similarly, DONEY/CANNON (1997) in their study on industrial buyers, as well as DONEY/BARRY/ABRATT (2007) in their investigation of business-to-business services, stated that brand trust encompasses two essential elements: credibility and benevolence. Trust in an exchange partner's credibility refers to the belief that the other party is sincere, fulfills promises, and stands by its word, whereas trust in the partner's benevolence is based on the belief that the other party is interested in the other's welfare and does not engage in opportunistic actions.¹⁰⁴² In a business-to-business e-commerce setting, HELM/STÖLZLE (2007) also followed a multidimensional concept of brand trust and apply a formative measurement approach covering three items reflecting fairness, overall trust, and benevolence on seven-point agreement scales.¹⁰⁴³

The discussion on the dimensionality and measurement of brand trust is ongoing. While several publications follow a holistic understanding of the construct centering on parties' overall belief or willingness to trust in their counterpart, others account for the fact that parties' trust may refer to distinct facets of the relationship. Against the background of the various operationalizations, LI et al. (2008) examined brand trust as a two-dimensional second-order formative construct (comprising the two dimensions competence and benevolence) and also included a reflective measurement model for overall brand trust. The authors concluded that brand trust can be measured either directly in a global measure or indirectly through measuring its various dimensions; however, researchers should be clear about the level of trust that they are interested in.¹⁰⁴⁴ In this regard, it can be stated that the dimensionality and operationalization of the brand trust construct strongly depends on the study focus. In cases where the construct itself is in the center of interest, multidimensional approaches that apply measures which specifically tap into different dimensions of the concept domain are dominant. On the other hand, unidimensional approaches are preferred when the construct is examined in the context of a comprehensive model comprising several other constructs.

Regarding the measurement mode, reflective measurement models obviously dominate the reviewed literature, even in cases where a multidimensional understanding of brand trust might imply a formative measurement mode as a viable option. Few studies (e.g., HELM/STÖLZLE (2007) and DELGADO-BALLESTER/MUNUERA-ALEMAN (2005)) stand out as applying formative measurement models or individual constructs for the different dimensions of brand trust.

4.4.5.2 Proposed Dimensionality and Measurement Approach

Considering the importance of a strong and stable relationship between office tenants and property owners, brand trust is proposed as a substantial component of brand equity in the scope of this work. However, the interest in the construct centers mainly on its role within the overall complex of potentially relevant brand equity elements, whereas its components and their relationship are not in the focus. For this reason, and in line with the

¹⁰⁴² See DONEY/BARRY/ABRATT (2007), pp. 1099-1106; DONEY/CANNON (1997), p. 48.

¹⁰⁴³ See HELM/STÖLZLE (2007), pp. 76-77.

¹⁰⁴⁴ See LI et al. (2008), pp. 833-837.

working definition of brand trust adapted from CHAUDHURI/HOLBROOK (2001), this work employs a unidimensional understanding of brand trust as an overall feeling or a dispositional tendency toward the property brand.

Building upon the work of SELNES (1998) and MICHELL/REAST/LYNCH (1998), a single item, *Overall Brand Trust (TRU1)*, was chosen to capture respondents' general willingness to rely on the property brand on the basis of their agreement with a corresponding statement on a seven-point scale from 1 "strongly disagree" to 7 "strongly agree." The following instruction and statement were provided:

"Please rate the following statement as how strongly you agree or disagree on a scale from 1 'strongly disagree' to 7 'strongly agree': I trust the people behind (brand name)."

Table provides a brief summary of the indicator set.

Table 24: Overview of Indicator Set – Brand Trust

Construct	Name		Description/Instruction	Scaling	Sources
Brand Trust	TRU1	Overall Brand Trust	"The owner and the people behind (property brand name) are very trustworthy."	1 "very strongly disagree" - 7 "very strongly agree"	Selnes (1998), Michell/Reast/Lynch (1998)

Source: Own illustration.

Equivalent to the case of brand familiarity, which is measured with a single indicator, measurement quality of brand familiarity might be reduced.¹⁰⁴⁵ However, taking into account the recommendations by HAIR et al. (2014), PETRESCU (2013), DIAMANTOPOULOS et al. (2012), and FUCHS/DIAMANTOPOULOS (2009), and in line with the arguments for brand familiarity, applying a single-item approach seems justifiable for the following reasons:¹⁰⁴⁶

(1) Additional measures result in a multiplication of the duration of the survey since respondents are asked for their assessments of three property brands. (2) Brand trust is not explicitly in the focus of interest in this study but rather its role and overall nature within the brand equity framework. (3) Consistent with the argument of SELNES (1998), the concept of trust seems to be sufficiently concrete as respondents have a common and intuitive understanding of its meaning and measurement error can be assumed to be less prevalent. (4) Measurements of brand trust frequently apply indicators that are basically the same item slightly rephrased in different ways, indicating a high level of item homogeneity.

4.4.5.3 Development of Hypotheses

In business-to-business and business-to-consumer settings, brand trust has proven to have a positive effect on purchase intentions, willingness to pay a price premium, brand extensibility, and overall preference for a brand. However, the study results have not been unanimous. For instance, DONEY/BARRY/ABRATT (2007) found a significant positive relation between brand trust and the brand's share of purchases made by industrial buyers of

¹⁰⁴⁵ See MOOI/SARSTEDT (2011), pp. 28-29, SARSTEDT/WILCZYNSKI (2009), p. 223.

¹⁰⁴⁶ See HAIR et al. (2014) pp. 46-48; PETRESCU (2013), pp. 110-114; DIAMANTOPOULOS et al. (2012), pp. 444-446; FUCHS/DIAMANTOPOULOS (2009), pp. 203-206.

aviation component repair services.¹⁰⁴⁷ RIOS/RIQUELME (2010) showed a similar relation in their study on online retailers. The authors found that higher levels of brand trust are associated with higher levels of overall brand equity reflected in an increased willingness to pay a premium and a stronger purchase intention.¹⁰⁴⁸ However, in an earlier study in the same setting, the authors were not able to confirm a direct positive relation between brand trust and overall brand equity.¹⁰⁴⁹ In contrast, focusing on low-involvement products, REAST (2007) identified a positive effect of brand trust on respondents' attitude toward a brand extension.¹⁰⁵⁰ Similarly, DELGADO-BALLESTER/MUNUERA-ALEMÁN (2005) demonstrated in a business-to-customer setting that brand trust has an indirect positive effect on brand equity through brand loyalty.¹⁰⁵¹ In a study on mobile phone service providers, SICHTMANN (2007) also found a significant positive relation between brand trust and individuals' current purchase intention and their openness to brand innovations.¹⁰⁵² ROBERTS/MERRILEES (2007) examined brand trust as an antecedent of retail tenants' willingness to renew their contract with the management of a shopping center. The results indicated that higher levels of trust in the management behind the shopping center were related to a higher willingness to retain the contractual relationship.¹⁰⁵³ A positive relation between business customers' trust in courier delivery services and their purchase intention was hypothesized by RAUYRUEN/MILLER/GROTH (2007). However, the authors were not able to confirm their initial hypothesis.¹⁰⁵⁴

Despite individual publications that do not support brand familiarity as an antecedent of brand equity in specific settings, there is a tendency to assume a positive relation between the two constructs. ROBERTS/MERRILEES's (2007) publication in the field of shopping center management services especially supports the proposition that commercial tenants that trust in the management behind a property tend to develop favorable attitudes and behaviors toward a brand. Consequently, the following hypothesis is suggested:

H_{TRU1}: Brand Trust is positively related to Overall Brand Equity.

Significantly more publications have examined the relation between brand trust and brand loyalty across different study settings. For instance, focusing on tire dealers, MORGAN/HUNT (1994) found a significant favorable effect of trust on respondents' commitment toward their exchange partner and their willingness to cooperate.¹⁰⁵⁵ Covering 107 brands across several industries, CHAUDHURI/HOLBROOK (2001) also identified a positive relation between trust and attitudinal loyalty and between trust and behavioral loyalty. The authors concluded that brand trust leads to brand loyalty because trust creates highly valued exchange relationships.¹⁰⁵⁶ In a financial services environment, CHIOU/DROGE/HANVANICH (2002) confirmed that higher levels of trust are directly and indirectly (through satisfaction)

¹⁰⁴⁷ See DONEY/BARRY/ABRATT (2007), p. 1108.

¹⁰⁴⁸ See RIOS/RIQUELME (2010), p. 224.

¹⁰⁴⁹ See RIOS/RIQUELME (2008), p. 732.

¹⁰⁵⁰ See REAST (2005), p. 7.

¹⁰⁵¹ See DELGADO-BALLESTER/MUNUERA-ALEMÁN (2005), pp. 191-193.

¹⁰⁵² See SICHTMANN (2007), p. 1008.

¹⁰⁵³ See ROBERTS/MERRILEES (2007), p. 414.

¹⁰⁵⁴ See RAUYRUEN/MILLER/GROTH (2007), p. 182.

¹⁰⁵⁵ See MORGAN/HUNT (1994), p. 30.

¹⁰⁵⁶ See CHAUDHURI/HOLBROOK (2001), p. 89.

associated with a higher level of attitudinal loyalty and willingness to recommend the service provider.¹⁰⁵⁷

Consistent with those early publications, later studies support the positive results of brand trust. DELGADO-BALLESTER/MUNUERA-ALEMAN (2005) found proof for a separately significant effect of brand reliability and brand intentions on the brand loyalty construct in a consumer goods environment.¹⁰⁵⁸ In a retail setting, ESCH et al. (2006) identified an indirect effect of brand trust through brand attachment leading to an increase in customers' current and future purchase intentions.¹⁰⁵⁹ Moreover, SICHTMANN (2007) postulated that trust had a substantial impact on customers' willingness to recommend a certain mobile phone service provider to others.¹⁰⁶⁰ Centering on athletic shoes, the findings of GEÇTİ/ZENGİN (2013) suggested a positive relation of customers' trust in a brand and their attitudinal and behavioral loyalty.¹⁰⁶¹ Similarly, RIOS/RIQUELME (2008) detected a significant positive relationship between brand trust and brand loyalty in an online retail environment.¹⁰⁶²

In a business-to-business context, brand trust was also confirmed as a direct antecedent of brand loyalty. For instance, DONEY/BARRY/ABRATT (2007) found a positive relation between brand trust and the loyalty of industrial buyers of aviation component repair services.¹⁰⁶³ Similarly, TRAN/COX (2009) postulated that brand trust is positively related to brand loyalty in relationships between manufacturers and retailers.¹⁰⁶⁴ Similarly, RAMASESHAN/RABBANEE/HUI's (2013) study confirmed that professional buyers of telecommunication services show higher levels of recommendation and purchase intention when they have a higher level of trust toward their provider.¹⁰⁶⁵

Finally, an experimental study that highlights a protective effect of brand trust regarding brand loyalty should be emphasized at this point: HERBST et al. (2012) found that when individuals trust a brand, they tend to be inattentive to negative trust cues because they have developed confidence that the brand is unlikely to take advantage of them. In this way, customers' trust protects the stability of the exchange relationship against negative brand-related information.¹⁰⁶⁶

Altogether, there is strong empirical evidence to propose a direct positive relation between brand trust and brand loyalty. This assumption seems reasonable from a real estate perspective also. Office tenants that have confidence in the management of their property should be more likely to recommend the property to others and feel attached to the brand. A state of trust can be expected to reduce tenants' perceived risk regarding opportunistic intentions of their landlord and to contribute to an effective, efficient, and productive tenancy relationship that is highly valued. More formally, the following hypothesis is suggested:

¹⁰⁵⁷ See CHIOU/DROGE/HANVANICH (2002), p. 121.

¹⁰⁵⁸ See DELGADO-BALLESTER/MUNUERA-ALEMAN (2005), p. 191.

¹⁰⁵⁹ See ESCH et al. (2006), p. 102.

¹⁰⁶⁰ See SICHTMANN (2007), p. 1008.

¹⁰⁶¹ See GEÇTİ/ZENGİN (2013), p. 116.

¹⁰⁶² See RIOS/RIQUELME (2008), p. 732.

¹⁰⁶³ See DONEY/BARRY/ABRATT (2007), p. 1108.

¹⁰⁶⁴ See TRAN/COX (2009), p. 176.

¹⁰⁶⁵ See RAMASESHAN/RABBANEE/HUI (2013), p. 340.

¹⁰⁶⁶ See HERBST et al. (2012), p. 917.

H_{TRU2}: Brand Trust is positively related to Brand Loyalty.

4.4.6 Brand Loyalty

4.4.6.1 Literature Review: Dimensionality and Measurement Approaches

Even if there seems to be a common agreement on the multidimensional nature of the construct, a consensus on how to measure brand loyalty has not been achieved. Some researchers focus on a behavioral or attitudinal perspective only, while others aim at an integrative approach to operationalizing the construct.¹⁰⁶⁷ Initial empirical research has been clearly dominated by a behavioral view on loyalty, leading to the use of measures to capture repurchases by amount, sequence, and frequency. However, more recent publications apparently prefer more holistic or attitudinal approaches.¹⁰⁶⁸

In accordance with the focus of this study, the literature review centers on operationalizations of brand loyalty from an attitudinal or holistic perspective. Operationalizations that build upon a mere behavioral perspective are not considered.

Regarding measurement approaches that follow an attitudinal view on brand loyalty, YOO/DONTHU (2001) developed a set of reflective indicators that was adapted in several later publications across different product categories in business-to-business and business-to-consumer settings (e.g., BUIL/MARTÍNEZ/DE CHERNATONY (2013), RIOS/RIQUELME (2008), PAPPU/QUESTER/COOKSEY (2007), BALDAUF/CRAVENS/BINDER (2003), and WASHBURN/PLANK (2002)).¹⁰⁶⁹ The authors captured respondents' level of agreement with three statements: "I consider myself to be loyal to (brand name)," "(Brand name) would be my first choice," and "I will not buy other brands if (brand name) is available at the store."¹⁰⁷⁰ Thus, the measurement focused mainly on individuals' overall preference of a brand over other brands and their self-assessment regarding their intrinsic bond toward it.

In other publications, the indicator sets show different orientations reflecting diverse aspects of attitudinal brand loyalty. For example, in their study on sportswear, TONG/HAWLEY (2009) relied on five statements representing respondents' self-assessment regarding their overall loyalty toward the brand, their future purchase intention, their willingness to pay a price premium, and their willingness to recommend the brand to others.¹⁰⁷¹ GIL/ANDRÉS/SALINAS (2007) applied the same measurements in a fast-moving consumer goods environment but left out the willingness to pay a premium.¹⁰⁷² Similarly, WANG/WEI/YU (2008), examining durable and nondurable goods, and RIOS/RIQUELME

¹⁰⁶⁷ See DEWITT/NGUYEN/MARSHALL (2008), pp. 269-271.

¹⁰⁶⁸ See ANSELMSSON/JOHANSSON/PERSSON (2007), p. 403; OLIVER (1997), p. 392.

¹⁰⁶⁹ See BUIL/MARTÍNEZ/DE CHERNATONY (2013), p. 66; RIOS/RIQUELME (2008), p. 727; PAPPU/QUESTER/COOKSEY (2007), p. 741; BALDAUF/CRAVENS/BINDER (2003), p. 227; WASHBURN/PLANK (2002), p. 48.

¹⁰⁷⁰ See YOO/DONTHU (2001), p. 14.

¹⁰⁷¹ See TONG/HAWLEY (2009), p. 267.

¹⁰⁷² See GIL/ANDRÉS/SALINAS (2007), p. 193.

(2010), in an online retailer setting, included willingness to recommend, and put emphasis on buying the brand as a first choice over identical products from other brands.¹⁰⁷³

In another consumer goods setting, HELM/LANDSCHULZE (2013) adapted an indicator set from GANESH et al. (2000) comprising four indicators that reflect perceived value for money, respondents' overall brand preference/enthusiasm, their willingness to recommend the brand, and their conviction to make the best choice when buying the brand.¹⁰⁷⁴ In this way, the authors combined indicators tapping into the direction of individuals' esteem and appreciation and indicators capturing their brand-related intentions.

Several publications explicitly emphasize respondents' emotional disposition toward the brand in their measurement approach. For instance, LOBSCHAT et al. (2013) applied a set of four indicators, including a statement on individuals' feeling of regret in the case of a sudden withdrawal of the brand from the market.¹⁰⁷⁵ Investigating attitudinal brand loyalty in the motorbike sector, JAYAKUMAR/BEJOY's (2012) indicator set incorporates customers' commitment toward the brand, as well as their overall appreciation.¹⁰⁷⁶ Similarly, the indicators applied by JAHANGIR et al. (2009) cover respondents' feeling of attachment toward the brand and their brand-related feeling of comfort and well-being.¹⁰⁷⁷

In a business-to-business context, the approaches to measuring brand loyalty from an attitudinal perspective do not show greater deviances from those in business-to-customer settings. The majority of studies have relied mainly on reflective measures of respondents' willingness to recommend the brand to others, their overall satisfaction, and their intention to continue the business relationship (e.g., BONDESSON (2012), CHEN/SU (2012), JUNTUNEN/JUNTUNEN/JUGA (2011), BIEDENBACH/MARELL (2010), CHEN/SU/LIN (2010), VAN RIEL/DE MORTANGES/STREUKENS (2005)).¹⁰⁷⁸ Other publications have referred to one or two of those indicators and added measures reflecting individuals' bond with the brand. For instance, in their study on auditing services, BIEDENBACH/BENGTSSON/WINCENT (2011) included a loyalty self-assessment, and KIM/HYUN (2011), focusing on the IT software sector, relied on respondents' overall esteem and their confidence in the brand.¹⁰⁷⁹

Finally, several studies consider both attitudinal and behavioral aspects of brand loyalty as distinct constructs. One case in point is GEÇTI/ZENGİN's (2013) study in the athletic shoes sector. The authors integrated the two loyalty facets as separate constructs, measuring attitudinal loyalty with the help of respondents' willingness to pay a premium and their switching tendency, whereas behavioral loyalty was captured in statements regarding their future purchase intentions.¹⁰⁸⁰ In the same way, CHAUDHURI/HOLBROOK (2001) considered two distinct constructs for the loyalty facets. The measurement model of attitudinal

¹⁰⁷³ See RIOS/RIQUELME (2010), pp. 224-225; WANG/WEI/YU (2008), p. 310.

¹⁰⁷⁴ See HELM/LANDSCHULZE (2013), p. 54; GANESH et al. (2000) p. 74.

¹⁰⁷⁵ See LOBSCHAT et al. (2013), p. 143.

¹⁰⁷⁶ See JAYAKUMAR/BEJOY (2012), p. 53.

¹⁰⁷⁷ See JAHANGIR et al. (2009), p. 25.

¹⁰⁷⁸ See BONDESSON (2012), p. 34; CHEN/SU (2012), p. 63; JUNTUNEN/JUNTUNEN/JUGA (2011), p. 305; CHEN/SU/LIN (2010), p. 1237; VAN RIEL/DE MORTANGES/STREUKENS (2005), p. 844.

¹⁰⁷⁹ See BIEDENBACH/BENGTSSON/WINCENT (2011), p. 1101; KIM/HYUN (2011), p. 432.

¹⁰⁸⁰ See GEÇTI/ZENGİN (2013), p. 115.

loyalty taps into the direction of commitment and willingness to pay a premium, whereas the measurement of behavioral loyalty centers on future purchase intentions.¹⁰⁸¹

Altogether, looking at earlier publications, it becomes apparent that the majority of the measurement approaches include an indicator that reflects some form of respondents' intrinsic bond or connection with the brand, such as commitment, feeling loyal, appreciation, liking, enthusiasm, or regret. Secondly, most indicator sets comprise measures centering on future purchase and usage intentions toward the brand. Finally, a large proportion of measurement approaches capture respondents' willingness to recommend the brand to others as a reflection of the willingness to engage in positive word of mouth.

However, measurements for attitudinal and behavioral loyalty are not clearly distinguished, and in some cases, there is an overlap between the two. The attribution of indicators that tap into the direction of customers' future intentions toward the brand especially is not clear-cut in some cases. Some authors, such as GEÇTI/ZENGİN (2013) or CHAUDHURI/HOLBROOK (2001), have associated current and future purchase intentions with behavioral loyalty, whereas others, such as BONDESSON (2012) or CHEN/SU (2012), have suggested these indicators for measuring attitudinal loyalty.

4.4.6.2 Proposed Dimensionality and Measurement Approach

In accordance with previous publications that focused their measurement approaches on attitudinal loyalty, this study applies a reflective mode to capture attitudinal brand loyalty. Following LOBSCHAT et al. (2013), JAYAKUMAR/BEJOY (2012), JAHANGIR et al. (2009), KELLER/APÉRIA/GEORGSON (2008), and CHAUDHURI/HOLBROOK (2001), who emphasized individuals' emotional disposition toward a brand in their operationalizations of attitudinal loyalty, two indicators were adapted: *Attachment* (LOY1) as a reflection of respondents' commitment and personal bonding with the property, and *Regret* (LOY2), referring to feelings of personal loss in the hypothetical event of the sudden nonexistence of the property.¹⁰⁸² Additionally, and in line with the majority of studies focusing on attitudinal loyalty in both business-to-business and business-to-consumer settings (e.g., BONDESSON (2012), BIEDENBACH/MARELL (2010), and VAN RIEL/DE MORTANGES/STREUKENS (2005)), respondents' *Willingness to Recommend* (LOY3) the property to others was included in order to capture their intention to engage in favorable word-of-mouth activities toward the brand.¹⁰⁸³ The three indicators were presented as statements, and respondents were asked to rate their level of agreement on a seven-point scale from 1 "very strongly disagree" to 7 "very strongly agree." The full instruction was as follows:

"Please rate the following statements as how strongly you agree or disagree on a scale from 1 'very strongly disagree' to 7 'very strongly agree':"

Table summarizes the indicator set of the brand loyalty construct.

Table 25: Overview of Indicator Set – Brand Loyalty

¹⁰⁸¹ See CHAUDHURI/HOLBROOK (2001), pp. 87-88.

¹⁰⁸² See LOBSCHAT et al. (2013), p. 143; JAYAKUMAR/BEJOY (2012), p. 53; JAHANGIR et al. (2009), p. 25; KELLER/APÉRIA/GEORGSON (2008), p. 74; CHAUDHURI/HOLBROOK (2001), pp. 87-88.

¹⁰⁸³ See BONDESSON (2012), p. 34; BIEDENBACH/MARELL (2010), p. 452; VAN RIEL/DE MORTANGES/STREUKENS (2005), p. 844.

Construct	Name		Description/Instruction	Scaling	Sources
Brand Loyalty	LOY1	Attachment	"I feel very attached to (property brand name)."	1 "very strongly disagree" - 7 "very strongly agree"	Lobschat et al. (2013), Jayakumar/Bejoy (2012), Jahangir et al. (2009), Keller/Apéria/Georgson (2008), Chaudhuri/Holbrook (2001)
	LOY2	Regret	"I would deeply regret if (property brand name) did not exist anymore."	1 "very strongly disagree" - 7 "very strongly agree"	
	LOY3	Willingness to Recommend	"I would recommend a close friend to lease in (property brand name)."	1 "very strongly disagree" - 7 "very strongly agree"	Bondesson (2012), Biedenbach/Marell (2010), Van Riel/De Mortanges/Streuken (2005)

Source: Own illustration.

4.4.6.3 Development of Hypotheses

Across different settings in business-to-business and business-to-customer markets, numerous studies have found empirical evidence for a positive relation between brand loyalty and overall brand equity. However, the assumed direction of the relation strongly depends on the concept and measurement approach of the two constructs.

Some studies, especially in an industrial buying context, consider brand loyalty as an outcome rather than antecedent of brand equity. For instance, VAN RIEL/DE MORTANGES/STREUKENS (2005) conceptualized brand loyalty as a desired outcome of brand equity. The authors examined the individual relations of product brand equity and corporate brand equity with brand loyalty in the chemical industry and found a positive relation in both cases.¹⁰⁸⁴ In the same way, CHEN/SU (2012) suggested that from a customer-based perspective, brand equity stems from great confidence or strong favorable images in customers' minds that will translate into customer loyalty, which consequently has an influence on their willingness to pay premium prices. Focusing on the fastener industry, the authors found empirical evidence for their hypothesis and proposed that brand equity is an antecedent of brand loyalty.¹⁰⁸⁵ In contrast to this result, CHEN/SU/LIN (2010) confirmed a reverse chain of effects between the two constructs in an earlier study in the same industry setting.¹⁰⁸⁶

Similarly, in their study on business-to-business logistics services, JUNTUNEN/JUNTUNEN/JUGA (2011) argued that a company's brand equity (reflected by customers' willingness to pay a premium, the perceived level of differentiation, and competitive advantage of the brand) has a strong impact on customers' loyalty intentions (reflected in their overall satisfaction and their willingness to continue the business relationship). However, the study results indicated that loyalty is not an outcome of brand equity.¹⁰⁸⁷ RAMASESHAN/RABBANEE/HUI's (2013) examination of on-hold telecommunication service providers had a similar result. The authors did not confirm their hypothesized positive relation between brand equity and brand loyalty and argued that brand equity might generally be of lesser importance in a business-to-business context.¹⁰⁸⁸

¹⁰⁸⁴ See VAN RIEL/DE MORTANGES/STREUKENS (2005), p. 845.

¹⁰⁸⁵ See CHEN/SU (2012), p. 61.

¹⁰⁸⁶ See CHEN/SU/LIN (2010), p. 1237.

¹⁰⁸⁷ See JUNTUNEN/JUNTUNEN/JUGA (2011), p. 304.

¹⁰⁸⁸ See RAMASESHAN/RABBANEE/HUI (2013), p. 340.

In contrast to those studies, a majority of publications in business-to-business and business-to-consumer markets have postulated a positive effect of brand loyalty on brand equity. For instance, YOO/DONTHU (2001) confirmed brand loyalty as a dimension of brand equity that has a positive direct influence on respondents' brand preference in comparison to an identical product from another brand.¹⁰⁸⁹ Covering 41 product categories, CHAUDHURI/HOLBROOK (2001) found a significant positive relation between attitudinal brand loyalty and respondents' willingness to pay a premium, and between behavioral loyalty (purchase loyalty) and a brand's market share.¹⁰⁹⁰ DELGADO-BALLESTER/MUNUERA-ALEMÁN (2005), GIL/ANDRÉS/SALINAS (2007), and TONG/HAWLEY (2009) also supported those findings with their studies on consumer goods, postulating a positive effect of brand loyalty on brand equity.¹⁰⁹¹ Equivalently, RIOS/RIQUELME (2008) and RIOS/RIQUELME (2010) found evidence for a positive relation between brand loyalty and overall brand equity in an online retailer setting.¹⁰⁹²

Regarding potential outcomes of brand equity, WANG/WEI/YU (2008) and JAHANGIR et al. (2009) found that higher levels of attitudinal brand loyalty are associated with a more positive attitude toward brand extensions of consumer goods brands.¹⁰⁹³ In a similar consumer goods setting, HELM/LANDSCHULZE (2013) identified a significant positive effect of loyal attitudes on cross buying behavior and a significant negative influence on the willingness to switch to alternative brands.¹⁰⁹⁴

In a business-to-business context, the assumption of a positive effect of brand loyalty on brand equity also has strong support. For instance, in their study on tile manufacturers, BUIL/MARTÍNEZ/DE CHERNATONY (2013) detected a direct positive influence on overall brand equity, which was also confirmed by KIM/HYUN (2011) in their study on the IT software sector.¹⁰⁹⁵ Moreover, BALDAUF/CRAVENS/BINDER (2003) identified brand loyalty as a direct antecedent of tile manufacturers' brand profitability, brand market performance, and customer perceived value.¹⁰⁹⁶

On balance, there is wide empirical support for a positive relationship between brand loyalty and brand equity. Indeed, evidence is not unanimous regarding the causality between the two constructs, and arguments for both directions seem justified depending on the conceptualization and operationalization of the constructs. However, findings from studies that hypothesize a positive effect of brand equity on brand loyalty seem to be less unanimous than results from studies assuming the reverse. Looking at the dominant empirical evidence from studies that focus on brand loyalty as an emotional connection between a customer and a brand, it seems reasonable for this study to assume that overall brand equity in terms of brand preference is a consequence rather than an antecedent of brand loyalty. This understanding is also supported by the hierarchy of effects, which is part of

¹⁰⁸⁹ See YOO/DONTHU (2001), pp. 10-12.

¹⁰⁹⁰ See CHAUDHURI/HOLBROOK (2001), p. 89.

¹⁰⁹¹ See TONG/HAWLEY (2009), p. 268; GIL/ANDRÉS/SALINAS (2007), p. 196; DELGADO-BALLESTER/MUNUERA-ALEMÁN (2005), p. 191.

¹⁰⁹² See RIOS/RIQUELME (2010), p. 229; RIOS/RIQUELME (2008), p. 732.

¹⁰⁹³ See JAHANGIR et al. (2009), p. 25; WANG/WEI/YU (2008), pp. 311-312.

¹⁰⁹⁴ See HELM/LANDSCHULZE (2013), pp. 47-49.

¹⁰⁹⁵ See BUIL/MARTÍNEZ/DE CHERNATONY (2013), p. 68; KIM/HYUN (2011), p. 433.

¹⁰⁹⁶ See BALDAUF/CRAVENS/BINDER (2003), p. 232.

the theoretical framework for this work. In accordance with this model, brand loyalty is a vital step in building brand equity, and thus is an antecedent rather than a consequence of a brand's added value.

From a real estate perspective, this assumption also seems appropriate. Office tenants that have an intrinsic bond with a property brand can be assumed to develop an overall favorable attitude toward it, attribute an incremental value to the property based on its brand, and prefer the building in leasing decisions. Against this background, the following hypothesis is derived:

H_{LOY1}: Brand Loyalty is positively related to Overall Brand Equity.

4.4.7 Overall Brand Equity

4.4.7.1 Literature Review: Dimensionality and Measurement Approaches

While there is a common understanding of the concept of consumer-related brand equity, publications have followed different approaches in the measurement of the construct depending on their individual objectives and settings. One can roughly distinguish between measurement models that focus on respondents' preference for a brand in comparison with similar products from other brands, models that center on the willingness to pay a price premium or perceived value for the cost, and models that emphasize the incremental and unique value of a brand from a more affective perspective. Indeed, authors also combine indicators reflecting different aspects of brand equity; however, this categorization seems to be a sufficient basis for a brief overview of the basis of the dominant focus of the measurement approaches.

Centering on individuals' preference for a brand over identical products from other brands, YOO/DONTHU (2001) suggested four reflective indicators based on similar statements that were slightly rephrased (e.g., "Even if another brand has the same features as X, I would prefer to buy X").¹⁰⁹⁷ This approach has found some acceptance in later publications and was also adapted by other authors, such as KIM/HYUN (2011), GIL/ANDRÉS/SALINAS (2007), DELGADO-BALLESTER/MUNUERA-ALEMÁN (2005), and WASHBURN/PLANK (2002).¹⁰⁹⁸

Other publications have emphasized respondents' price sensitivity or a brand's perceived value for the cost in their measurement approaches. For instance, RIOS/RIQUELME (2008) and RIOS/RIQUELME (2010) applied two indicators covering respondents' willingness to pay a premium ("I'm willing to pay a premium of up to 10 percent when purchasing from X as opposed to a less well known brand") and their general brand preference.¹⁰⁹⁹ Similarly, CHEN/SU/LIN (2011) and CHEN/SU (2012) included individuals' perception of a brand's value for the cost and their willingness to pay more in their measurement model for brand equity in a business-to-business setting.¹¹⁰⁰ Examining nonprofit organizations, FAIRCLOTH

¹⁰⁹⁷ See YOO/DONTHU (2001), p. 14.

¹⁰⁹⁸ See KIM/HYUN (2011), p. 432; GIL/ANDRÉS/SALINAS (2007), p. 193; DELGADO-BALLESTER/MUNUERA-ALEMÁN (2005), p. 190; WASHBURN/PLANK (2002), p. 47.

¹⁰⁹⁹ See RIOS/RIQUELME (2010), p. 225; RIOS/RIQUELME (2008), p. 726.

¹¹⁰⁰ See CHEN/SU (2012), p. 63; CHEN/SU/LIN (2011), p. 1237.

(2005) put emphasis on respondents' willingness to pay premium fees and a membership's perceived value for the money.¹¹⁰¹

The incremental and unique value of a brand in customers' eyes is highlighted in several operationalizations. For example, RAMASESHAN/RABBANEE/HUI (2013) focused on brands' overall attractiveness and their perceived uniqueness and level of differentiation.¹¹⁰² In a similar manner, JUNTUNEN/JUNTUNEN/JUGA (2011) and DAVIS/GOLICIC/MARQUARDT (2009) included indicators reflecting individuals' perceptions of a brand's uniqueness and overall competitive advantage in order to capture the construct domain.¹¹⁰³ In a business-to-business setting, KIM/CAVUSGIL (2009) applied measures that tapped into the direction of a brand's prestigiousness and respondents' emotional bond with the brand.¹¹⁰⁴ TONG/HAWLEY (2009) also included a measure representing respondents' enthusiasm toward a brand in their indicator set.¹¹⁰⁵ ROBERTS/MERRILEES (2007) offered the only study that is in thematic proximity to this work, focusing on brands in a shopping center environment. In their measurement approach, the authors emphasized a center's overall reputation in the eyes of the tenants, their enthusiasm and admiration toward the brand, and the perceived level of differentiation.¹¹⁰⁶

4.4.7.2 Proposed Dimensionality and Measurement Approach

Looking at previous approaches to operationalizing overall brand equity, this study follows the main stream of publications and applies a reflective measurement mode for the construct. Regarding the indicator set, centering on measurements that require a comparison of a branded product with an identical alternative from another brand seems questionable in a property context. Considering the discussion of real estate particularities in section **Fehler! Verweisquelle konnte nicht gefunden werden.**, every property is characterized by an inherent uniqueness due to its individual and uncopiable location, thus making it impossible to compare properties that vary only in their brand. In contrast, focusing on general preferences for a property as a whole over comparable alternatives does not allow the separation of the value added by the brand from the particularities of the location and the building. However, in this way, a general impression of respondents' appreciation might be captured.

Against this background, it seems reasonable to focus the measurement approach for overall brand equity on capturing the incremental value of a brand in terms of individuals' affection and attraction toward the brand as well as in terms of their perceptions of value for the cost. For this purpose, four indicators reflecting a property's overall brand equity were adapted from previous publications that applied a similar measurement approach. Following the suggestion of ROBERTS/MERRILEES (2007), TONG/HAWLEY (2009), and KIM/CAVUSGIL (2009), the indicators *Enthusiasm* (OBE1) and *Prestige* (OBE2) were included: Enthusiasm refers to tenants' overall emotional disposition toward the property

¹¹⁰¹ See FAIRCLOTH (2005), p. 5.

¹¹⁰² See RAMASESHAN/RABBANEE/HUI (2013), p. 340.

¹¹⁰³ See JUNTUNEN/JUNTUNEN/JUGA (2011), p. 304; DAVIS/GOLICIC/MARQUARDT (2009), p. 205.

¹¹⁰⁴ See KIM/CAVUSGIL (2009), p. 501.

¹¹⁰⁵ See TONG/HAWLEY (2009), p. 267.

¹¹⁰⁶ See ROBERTS/MERRILEES (2007), p. 413.

brand, and Prestige covers the perceived prestigiousness of a tenancy, thus reflecting that a value is attributed to the property which goes beyond its mere functionality as a building.¹¹⁰⁷ Building upon the work of FAIRCLOTH (2005), CHEN/SU/LIN (2011), and CHEN/SU (2012), *Value for the Cost (OBE3)* was used as an additional representation of respondents' esteem for a brand based on their consideration of brand-related benefits and costs.¹¹⁰⁸ Finally, *Overall Lease Preference (OBE4)* was added to the indicator set to account for respondents' confidence in the decision to lease in the property and their underlying comprehensive assessment of the property brand. A similar indicator focusing on individuals' overall brand preference was also applied in the work of RIOS/RIQUELME (2010, 2008) and ROBERTS/MERRILEES (2007).¹¹⁰⁹

Respondents were provided with corresponding statements and were asked to rate their level of agreement on a seven-point scale from 1 "strongly disagree" to 7 "strongly agree." The respective instruction was as follows:

"Please rate the following statements as how strongly you agree or disagree on a scale from 1 'very strongly disagree' to 7 'very strongly agree':"

Table provides a brief overview of the indicator set for the construct.

Table 26: Overview of Indicator Set – Overall Brand Equity

Construct	Name	Description/Instruction	Scaling	Sources
Overall Brand Equity	OBE1	Enthusiasm "People who work in (property brand name) are very enthusiastic about the property."	1 "very strongly disagree" - 7 "very strongly agree"	Tong/Hawley (2009), Kim/Cavusgil (2009), Roberts/Merrilees (2007)
	OBE2	Prestige "It is very prestigious to lease in (property brand name)."	1 "very strongly disagree" - 7 "very strongly agree"	
	OBE3	Value for the Cost "Overall, leasing in (property brand name) is worth the money."	1 "very strongly disagree" - 7 "very strongly agree"	Chen/Su (2012), Chen/Su/Lin (2011), Faircloth (2005)
	OBE4	Overall Lease Preference "Overall, it is an excellent decision to lease in (property brand name)."	2 "very strongly disagree" - 7 "very strongly agree"	Rios/Riquelme (2010, 2008), Roberts/Merrilees (2007)

Source: Own illustration.

4.5 Model Synthesis: Final Proposed Model of Brand Equity in an Office Property Context

On the basis of the hypotheses derived in the last chapter, the basic conceptual framework from Section **Fehler! Verweisquelle konnte nicht gefunden werden.** is substantiated and the final suggested model for brand equity in an office property context developed and empirically tested in the following step of the study. Figure on page 229 illustrates the postulated model, and Table on page 230 provides a summary of the set of hypotheses.

¹¹⁰⁷ See KIM/CAVUSGIL (2009), p. 501; TONG/HAWLEY (2009), p. 267; ROBERTS/MERRILEES (2007), p. 413.

¹¹⁰⁸ See CHEN/SU (2012), p. 63; CHEN/SU/LIN (2011), p. 1237; FAIRCLOTH (2005), p. 5.

¹¹⁰⁹ See RIOS/RIQUELME (2010), p. 225; RIOS/RIQUELME (2008), p. 726; ROBERTS/MERRILEES (2007), p. 413.

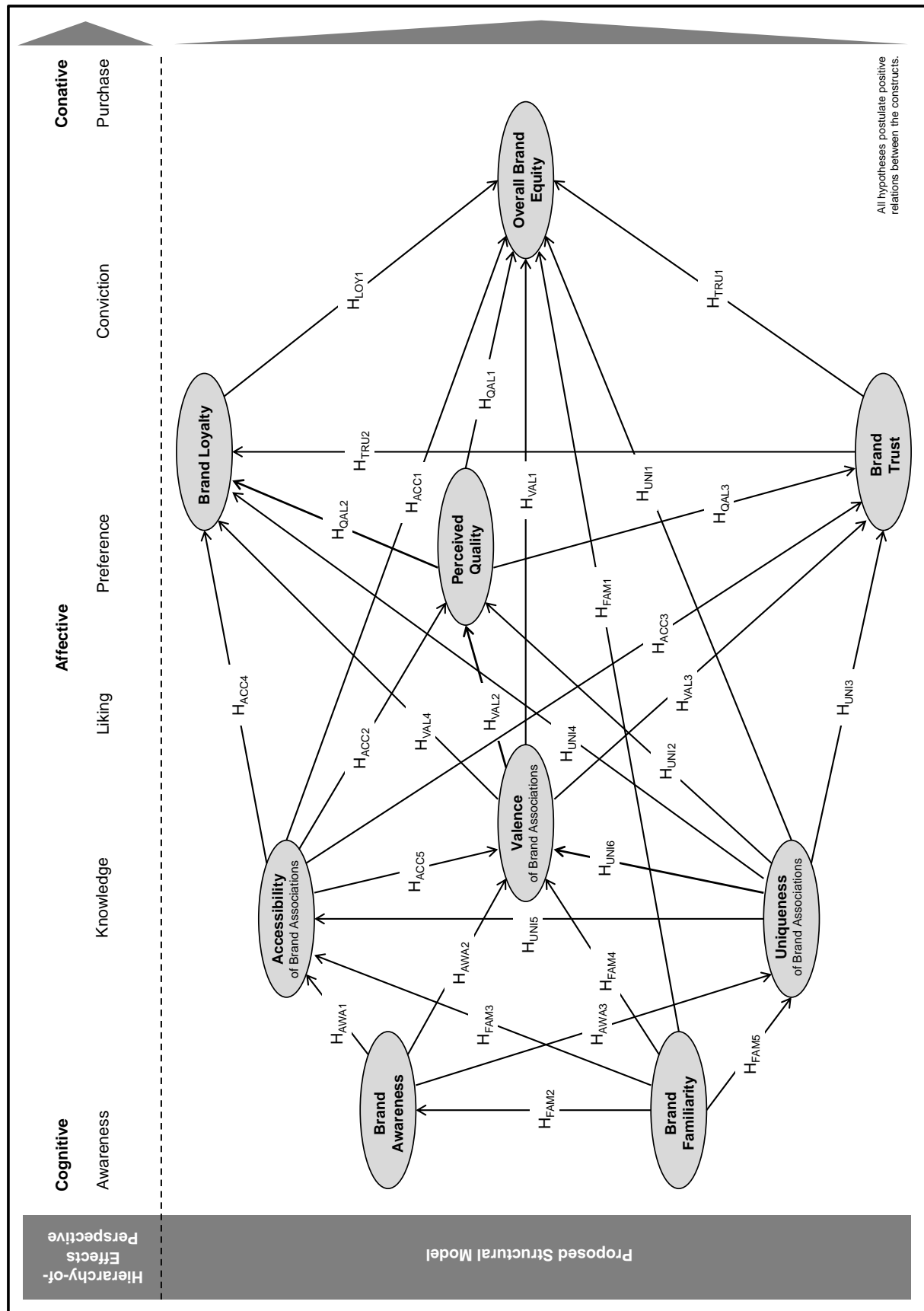
It seems useful at this point to briefly discuss the proposed framework against the four most similar practice-based brand equity models that were described in Section **Fehler! Verweisquelle konnte nicht gefunden werden.** in order to highlight differences and commonalities. Moreover, it appears reasonable to consider the proposed model in light of the few publications in the field of real estate that focus on property brands.

Initially, the model should be compared to the Real Estate Brand Potential Index developed by Premise Brand+/MPG Solutions because this is the only approach that explicitly centers on the measurement of brand equity in a real estate context.¹¹¹⁰ Considering their objectives, the two models have a different focus. The Real Estate Brand Potential Index examines emotional brand equity in a corporate context across different sectors of the real estate industry on the basis of four independent components. For this purpose, the dimensions and indicators capture market participants' perception of brands on a company level. Moreover, the indicator set encompasses assessments of a company's success in the market and its overall market share. By contrast, the proposed model focuses on the brand equity of office property brands and – apart from respondents' trust in the people behind a property brand – does not consider the company level. In addition, the model that is proposed in this study does not assume that the brand equity components are independent of each other; rather, they are suggested to follow a hierarchy of effects that reflects a causal chain of how brand equity is built. Regarding the indicator set, however, the two models exhibit some commonalities. For instance, brand awareness, service quality, flexibility, value for the money, trustworthiness, uniqueness, and recommendation are reflected in both approaches.

As a result, one can state that even if both models share some of their indicators, they clearly differ in their overall focus, objective, and complexity. The Real Estate Brand Potential Index may provide an easily accessible overview of the brand equity status of a property brand, whereas the suggested model allows for drawing conclusions on the performance, the main drivers of office property brands, and their relations.

Figure 24: Final Proposed Model of Brand Equity in an Office Property Context

¹¹¹⁰ See Section **Fehler! Verweisquelle konnte nicht gefunden werden.**



Source: Own illustration.

Table 27: Overview of Hypotheses

Construct	Hypotheses	Sources/Rationale
Brand Familiarity (FAM)	H _{FAM1} FAM is positively related to OBE	PINAIVERSEN/MARTÍNEZ (2010), MCCORKINDALE (2008), MACKAY (2001), HUTTON (1997), AGARWAL/RAO (1996), LANE/JACOBSON (1995), ZIMBARDO/LEIPPE (1991)
	H _{FAM2} FAM is positively related to AWA	DELGADO-BALLESTER/NAVARRO/SICILIA (2012), MIKHAILITCHENKO et al. (2009), CAMPBELL/KELLER (2003), KENT/KELLARIS (2001), KELLER (1993)
	H _{FAM3} FAM is positively related to ACC	CAMPBELL/KELLER (2003), KENT/ALLEN (1994), ALBA/HUTCHINSON/LYNCH (1991), KELLER (1987)
	H _{FAM4} FAM is positively related to VAL	DELGADO-BALLESTER/NAVARRO/SICILIA's (2012), BOGOMOLOVA/ROMANIUK (2010), DAWAR/LEI (2009), PARK (2009), LAROCHE/KIMZHOU (1996), BETTMAN/SUJAN (1987), ZAJONC/MARKUS (1982)
	H _{FAM5} FAM is positively related to UNI	OAKENFULL/MCCARTHY (2012)
Brand Awareness (AWA)	H _{AWA1} AWA is positively related to ACC	BUIL/DE CHERNATONY/MARTÍNEZ (2013), BUIL/MARTÍNEZ/DE CHERNATONY (2013), HYUN/KIM (2011), JUNTUNEN/JUNTUNEN/JUGA (2011), ESCH et al. (2006), SCHUILLING/KAPFERER (2004), KELLER (1993)
	H _{AWA2} AWA is positively related to VAL	
	H _{AWA3} AWA is positively related to UNI	
Accessibility of Brand Associations (ACC)	H _{ACC1} ACC is positively related to OBE	BARKER/VALOS/SHIMP (2012), KIMHYUN (2011), KELLER/APÉRIA/GEORGSON (2008), ROMANIUK/GAILLARD (2007), GEUS (2004), KELLER (1993)
	H _{ACC2} ACC is positively related to QAL	AMINI et al. (2012), HAMEED (2012), BIEDENBACH/BENGTTSSON/WINCENT (2011), HYUN/KIM (2011), LIAO/WIDOWATI/HU (2011), BIEDENBACH/MARELL (2010), WANG/WEI/YU (2008)
	H _{ACC3} ACC is positively related to TRU	MING/SMAIL/RASIAH (2011), HSU/CAI (2009), ELLIOTT/YANNAPOULOU (2007), KANDAMPULLY/HU (2007), ESCH et al. (2006), BACK (2005), YOON's (2002), KANDAMPULLY/SUHARTANTO (2000), REMPEL/HOLMES/ZANNA (1985)
	H _{ACC4} ACC is positively related to LOY	BONDESSON (2012), BIEDENBACH/BENGTTSSON/WINCENT (2011), JUNTUNEN/JUNTUNEN/JUGA (2011), TRAN/COX (2009)
	H _{ACC5} ACC is positively related to VAL	KRUGLANSKI/STROEBE (2014), CHO/SCHWARZ (2006)
Valence of Brand Associations (VAL)	H _{VAL1} VAL is positively related to OBE	BARKER/VALOS/SHIMP (2012), KELLER/APÉRIA/GEORGSON (2008), ROMANIUK/GAILLARD (2007), GEUS (2004), KELLER (1993)
	H _{VAL2} VAL is positively related to QAL	AMINI et al. (2012), HAMEED (2012), PAPPU/QUESTER/COOKSEY (2005), BIEDENBACH/BENGTTSSON/WINCENT (2011), HYUN/KIM (2011), LIAO/WIDOWATI/HU (2011), BIEDENBACH/MARELL (2010), WANG/WEI/YU (2008)
	H _{VAL3} VAL is positively related to TRU	MING/SMAIL/RASIAH (2011), HSU/CAI (2009), ELLIOTT/YANNAPOULOU (2007), KANDAMPULLY/HU (2007), ESCH et al. (2006), BACK (2005), YOON's (2002), KANDAMPULLY/SUHARTANTO (2000), REMPEL/HOLMES/ZANNA (1985)
	H _{VAL4} VAL is positively related to LOY	BONDESSON (2012), BIEDENBACH/BENGTTSSON/WINCENT (2011), JUNTUNEN/JUNTUNEN/JUGA (2011), TRAN/COX (2009)
Uniqueness of Brand Associations (UNI)	H _{UNI1} UNI is positively related to OBE	BARKER/VALOS/SHIMP (2012), KELLER/APÉRIA/GEORGSON (2008), ROMANIUK/GAILLARD (2007), GEUS (2004), NETEMEYER et al. (2004), KELLER (1993)
	H _{UNI2} UNI is positively related to QAL	AMINI et al. (2012), HAMEED (2012), BIEDENBACH/BENGTTSSON/WINCENT (2011), HYUN/KIM (2011), LIAO/WIDOWATI/HU (2011), NETEMEYER et al. (2004), BIEDENBACH/MARELL (2010), WANG/WEI/YU (2008)
	H _{UNI3} UNI is positively related to TRU	MING/SMAIL/RASIAH (2011), HSU/CAI (2009), ELLIOTT/YANNAPOULOU (2007), KANDAMPULLY/HU (2007), ESCH et al. (2006), BACK (2005), YOON's (2002), KANDAMPULLY/SUHARTANTO (2000), REMPEL/HOLMES/ZANNA (1985)
	H _{UNI4} UNI is positively related to LOY	BONDESSON (2012), BIEDENBACH/BENGTTSSON/WINCENT (2011), JUNTUNEN/JUNTUNEN/JUGA (2011), TRAN/COX (2009)
	H _{UNI5} UNI is positively related to ACC	ROMANIUK/GAILLARD (2007), MEYERS-LEVY (1989), GREENWALD/LEAVITT (1984), FAZIO (1986), TVERSKY (1972)
	H _{UNI6} UNI is positively related to VAL	CHANG (2004), NETEMEYER et al. (2004)
Perceived Quality (QAL)	H _{QAL1} QAL is positively related to OBE	KIMHYUN (2011), YASEEN et al. (2011), RAUYRUEN/MILLER (2007), VAN RIEL/DE MORTANGES/STREUKENS (2005), BALDAUF/CRAVENS/BINDER's (2003)
	H _{QAL2} QAL is positively related to LOY	BONDESSON (2012), BIEDENBACH/BENGTTSSON/WINCENT (2011), KIMHYUN (2011), BIEDENBACH/MARELL (2010), RAUYRUEN/MILLER (2007), RAUYRUEN/MILLER/GROTH (2007), MICHELL/KING/REAST (2001)
	H _{QAL3} QAL is positively related to TRU	CHINOMON/MAHLANGU/POOE (2013), DONEY/BARRY/ABRATT (2007), SICHTMANN (2007), CHIOU/DROGE/HANVANICH (2002)
Brand Trust (TRU)	H _{TRU1} TRU is positively related to OBE	RIOS/RIQUELME (2010), DONEY/BARRY/ABRATT (2007), REAST (2007), ROBERTS/MERRILEES (2007), SICHTMANN (2007), DELGADO-BALLESTER/MUNUERA-ALEMÁN (2005)
	H _{TRU2} TRU is positively related to LOY	GEÇTIZENGİN (2013), RAMASESHAN/RABBANEE/HUI (2013), HERBST et al. (2012), TRAN/COX (2009), RIOS/RIQUELME (2008), DONEY/BARRY/ABRATT (2007), SICHTMANN (2007), ESCH et al. (2006), DELGADO-BALLESTER/MUNUERA-ALEMÁN (2005), CHIOU/DROGE/HANVANICH (2002), CHAUDHURI/HOLBROOK (2001), MORGAN/HUNT (1994)
Brand Loyalty (LOY)	H _{LOY1} LOY is positively related to OBE	BUIL/MARTÍNEZ/DE CHERNATONY (2013), HELMLANDSCHULZE (2013), KIMHYUN (2010), RIOS/RIQUELME (2010), JAHANGIR et al. (2009), TONG/HAWLEY (2009), RIOS/RIQUELME (2008), WANG/WEI/YU (2008), BRAVO GIL/FRAJ ANDRÉS/MARTÍNEZ SALINAS (2007), DELGADO-BALLESTER/MUNUERA-ALEMÁN (2005), BALDAUF/CRAVENS/BINDER (2003), CHAUDHURI/HOLBROOK (2001), YOO/DONTHU (2001)

OBE: Overall Brand Equity

Source: Own illustration.

The MARKET-Q model is the only model of the reviewed practice-based approaches that explicitly focuses on brand equity in a business-to-business context. On this basis, the

model exhibits several commonalities with the suggested model for brand equity in an office property context but also a number of distinct characteristics. For one thing, the facets suggested for the different dimensions of brand equity in the MARKET-Q model also reflect Aaker's dimensions. However, the property brand equity model takes a more differentiated approach and individually considers a larger number of facets. Moreover, both models assume a hierarchy of effects between the brand equity components, although the proposed model follows a more detailed approach regarding the relationships between them and follows the cognitive-affective-conative concept more closely. The MARKET-Q model strongly emphasizes the relationship aspect as an individual dimension of the industrial brand equity concept, whereas the suggested model reflects relationship-related aspects only implicitly in terms of individuals' intrinsic bond with the property and their trust in the people behind the brand. In addition, the MARKET-Q approach includes three outcome variables that refer to price, volume, and support premiums. By contrast, the proposed model only focuses on a property's overall brand equity that mainly reflects perceptions of prestige, enthusiasm, value for the cost, and general preference. Finally, a brand's salience in terms of awareness is obviously not taken into account in the MARKET-Q model. Altogether, while both models follow a similar approach regarding the basic framework of brand equity in an industrial setting, they mainly differ in their focus. The MARKET-Q model obviously centers on the triad of functional attributes, emotional attributes, and the customer-brand relationship and provides a differentiated analysis of their influence on different favorable outcomes. By contrast, the suggested model aims at reflecting the steps in which brand equity is built in individuals' minds and additionally has a strong focus on the different facets of brand associations.

The suggested property brand equity framework has several similarities with Icon Added Value's 'Brand Iceberg'. Regarding the Brand Iconography facet of the Brand Iceberg model, the suggested property brand equity components of brand awareness, brand familiarity, and brand associations clearly have counterparts. In particular, the Brand Iceberg also explicitly encompasses brands' uniqueness and the accessibility and attractiveness of customers' mental image of the brand. In the same way, brand trust and brand loyalty are reflected in the Brand Credit facet. A major difference is that the proposed model puts more emphasis on the process of how brand equity is built in customers' minds along a continuous hierarchy of effects and thus does not strike a clear differentiation between short-term and long-term aspects of brand equity. Indeed, the clear-cut separation of those aspects strongly contributes to the intuitive accessibility and comprehensibility of the Brand Iceberg.

The suggested model follows a similar understanding of brand equity as the Brand Potential Index by GfK-Marktforschung; both models focus on customers' appreciation and esteem for the brand and highlight the importance of attitudes and motivations. However, the suggested model does not clearly distinguish between emotional, rational, and action-oriented aspects of brand equity, although these facets are generally reflected in the hierarchy-of-effects stages (cognition, affection, conation). Moreover, the Brand Potential Index includes more indicators capturing individuals' relationship with the brand such as empathy, identification, and confidence, whereas the proposed property brand equity

model contains only brand trust and brand loyalty as reflections of a personal connection to a property brand and the people behind it.

Overall, the suggested model captures all major facets of brand equity suggested by the practice-based approaches and is in accordance with their general customer-based perspective. However, a major point of difference is the assumption of a detailed hierarchy of effects between the brand equity components that follows the development of brand equity in customers' minds as a successive learning process. While this assumption allows for an identification of strengths and weaknesses in the brand equity building process, it reduces the model's simplicity at the same time.

Looking at the few publications that center on property brands in the sense of this work, which were briefly summarized in section **Fehler! Verweisquelle konnte nicht gefunden werden.**, the proposed model clearly captures and extends the aspects that were identified as relevant in building property brands.

The four brand-related factors that were emphasized by VIITANEN (2004) (performance, location, services, and image in terms of prestige) are explicitly covered in the model. The suggested perceived quality component captures buildings' functionality, location, and services in its indicator set. In the same way, a property's perceived prestigiousness is highlighted as a reflection of a brand's overall brand equity. Viitanen's approach is mainly quality focused and neglects a brand's salience in the market, as well as nonquality brand associations. Moreover, tenants' relationship with the brand and the people behind it is not taken into account. Consequently, the proposed model captures all aspects of Viitanen's approach and goes beyond the author's model by consequently applying a customer-based perspective including individuals' awareness, familiarity, brand associations, trust, and loyalty toward the brand.

HÄGG/SCHULTZ (2006) have argued that uniqueness is a central factor in building strong property brands. Similarly, ROULAC (2007) highlighted the prestige associated with a property as the main reflection of its brand. The proposed property brand equity model also accounts for both factors: The uniqueness of a brand in individuals' eyes is considered by including brand associations' uniqueness as a separate construct. Similarly, a property's prestige is integrated as a reflection of overall brand equity.

The model suggested in this study shares several similarities with MUSSLER's (2010) schematic brand value chain. The author's Brand Capital concept comprises brand knowledge, brand image, uniqueness, trust and sympathy, willingness to purchase or lease, willingness to pay a price premium, and brand attachment. Moreover, the author emphasizes the crucial role of the tenant-owner relationship and states that brand awareness is of utmost importance to establish brand familiarity, desirability, and attachment to the brand. Apart from the willingness to pay a premium, the proposed brand equity model contains all of those facets. However, besides the assumption that brand familiarity is an antecedent of brand awareness, there are two major differences between the two approaches: (1) Mussler does not account for the relations between the components of brand capital, whereas the proposed model explicitly considers this aspect. (2) While Mussler applies a management perspective in which brand capital is a stage in a property brand's overall management, the suggested property brand equity model consistently fo-

cuses on a customer-based understanding and builds upon a hierarchy of effects reflecting how brand equity is built in tenants' minds.

Altogether, one can state that the brand equity model that is suggested in this work encompasses the vast majority of factors that have been addressed by prior publications as being relevant for the success of a property brand. The model clearly stands out against existing approaches through a clear focus on the property level and a consistent emphasis of tenants' perceptions. Moreover, the model applies a rigorous orientation on a hierarchy of effects that reflects the way brand equity is built in tenants' minds and that is in line with the basic steps in office leasing processes.

4.6 Data Basis

In order to test the suggested model, an empirical study was conducted. This chapter provides an overview of the data collection approach and survey design, a brief description of the data sample, and an assessment of the sample size, missing values, and outliers.

4.6.1 Data Collection and Survey Design

Given that the proposed brand equity model follows a customer-based perspective, the relevant target population generally comprises all office tenants in Germany. Specifically, the relevant units of analysis are company representatives engaged in leasing decisions at the time of the study. However, all activities to identify members of this group and convince them to participate in the study were unsuccessful. Inquiries asking real estate agencies and large property owners to provide contact details of clients currently searching for office units or existing tenants in the process of renewing their lease contract were denied for reasons of confidentiality. Similar concerns of real estate owners to actively engage in academic studies and provide access to their tenants have also been reported in earlier publications.¹¹¹¹ For this reason, an appropriate surrogate was required that could empathize and engage with the role of an office leasing center member and that was willing to take part in the study. Division and branch managers and chief executive officers of real estate agencies in charge of office leasing mandates for companies in the German market were deemed suitable in this regard.

Using surrogate samples has been questioned for its limitations in external validity. For instance, the use of student samples asked to take an imaginary position as if they were other subjects (e.g., CEOs) has been critically discussed, and authors such as RIOS/RIQUELME (2008), WELLS (1993), and SEARS (1986) have emphasized the need for justifying surrogates' representativeness.¹¹¹²

In this regard, the use of office real estate agents as surrogates for office tenants in the course of a leasing decision seems justifiable for the following reasons: (1) As discussed in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, real estate agents

¹¹¹¹ For instance, ERTLE-STRAUB (2002), pp. 188-189 faced severe difficulties approaching office tenants in a study on relocation criteria. The author noted that property owners and developers were not willing to provide access to their tenants, stating that they might be disturbed and could make comparisons between their current office location and potential alternatives.

¹¹¹² See RIOS/RIQUELME (2008), p. 728; WELLS (1993), pp. 491-492; SEARS (1986), pp. 515-530.

hold an intermediary function in leasing processes and are frequently involved in all relevant steps of tenants' decision making, giving them the necessary understanding of the underlying mechanisms and interactions. (2) They possess a level of market knowledge that at least equals a highly informed company representative in an advanced stage of the leasing-decision process. (3) Real estate agents often act on behalf of companies that are searching for appropriate office units. Thus, real estate agents frequently take over the role of office tenants and make tenants' requirements their own. (4) Real estate agents are tenants in office buildings themselves, which additionally supports their ability to empathize with company representatives in search for office space.

However, due to the selection of a surrogate, this study cannot claim full representativeness of the original population and is valid only for this particular segment.

From a geographic point of view, it seemed appropriate to focus the data collection on respondents from Germany's top 10 office space markets, which were also included in the first study: Berlin, Dresden, Düsseldorf, Essen, Frankfurt/Main, Hamburg, Cologne, Leipzig, Munich, and Stuttgart. Together, the cities comprise approximately 99.0 million square meters of total office space and represent a share of 31.8% of the German office leasing market.¹¹¹³

Considering the wide geographical spread, the approximate length of the survey, the limited number of potential respondents, and the general reluctance of real estate professionals to participate in electronic or paper-based questionnaires in previous studies, questionnaire-based telephone interviews were chosen as an appropriate approach to achieve a satisfying response rate.¹¹¹⁴ Fixed appointments were agreed on and respondents were guided through the question set. In this way, a personal contact was established that encouraged participants to fully answer the questionnaire, thus reducing non-response errors. In case of interruptions, telephone interviews provided the flexibility to rearrange a scheduled interview. Together, these obvious advantages were considered to outweigh disadvantages such as a lack of visual aids and potential biases due to variances in the interviewer behavior.¹¹¹⁵ Moreover, interview partners were promised that only aggregated anonymized data would be used in the study and no third parties would be given access to their individual answers.

In order to capture all relevant real estate agencies in the top 10 office space markets and increase the overall response rate, the study, which was carried out between June and

¹¹¹³ Own estimation based on BNP PARIBAS REAL ESTATE (2014), p. 1; CUBIONIMMOBILIEN AG (2013), p. 7; DEUTSCHE GENOSSENSCHAFTS-HYPOTHEKENBANK AG (2013), p. 25; DR. LÜBKE & KELBER GMBH (2013), p. 2; BULWIEN/DENK/SCHEFFLER (2008), p. 86. The total amount of office space in Germany was estimated with 311.2 million square meters. See DEUTSCHER VERBAND FÜR WOHNUNGSWESEN, STÄDTEBAU UND RAUMORDNUNG E.V./GESELLSCHAFT FÜR IMMOBILIENWIRTSCHAFTLICHE FORSCHUNG E.V. (2012), p. 27.

¹¹¹⁴ For example, ERTLE-STRAUB (2002), p. 190 reported that in a paper-based questionnaire targeting representatives of companies' leasing centers, a response rate of 25.4% was achieved only with the help of multiple follow-up calls. Similarly, BRADE (1998), p. 150 achieved a response rate of 20.0% with strong support of property owners convincing tenants to take part in the study. Focusing on shopping center tenants, STURM (2006), p. 111 reached a response rate of 11.0%.

¹¹¹⁵ For a more detailed discussion of advantages and disadvantages of telephone interviews, see, for instance, OPDENAKKER (2006), pp. 4-6; GROVES (1990), pp. 221-240; ZIKMUND et al. (2013), pp. 212-217.

September 2010, followed a three-step approach: (1) an initial set of potential respondents was identified, (2) the initial set was successively extended based on respondents' market insights and personal contacts in their local market, and (3) the final set of respondents was contacted and the main survey carried out.

- (1) In the first step, five commercial real estate brokers with a focus on office buildings were identified for each of the selected cities. For this purpose, three online leasing platforms (www.immobilienscout24.de, www.immowelt.de, www.immonet.de) were screened, and those agencies (branch offices) offering the largest sum of office space (in square meters) in the respective city were selected.¹¹¹⁶ In this way, a general market relevance of all agencies was ensured, and an initial set of 50 potential respondents was identified.
- (2) A brief preliminary survey was carried out with the objective of initiating personal contact with the respondents and further broadening the sample size. In a short telephone interview, respondents were asked to name up to five office properties that they considered to be well known in their respective market.¹¹¹⁷ Afterward, the interview partners were asked to name all other real estate agencies focusing on office properties in their local market. Real estate agencies that were identified in this way were also contacted and provided with the same questions. When no new agencies were named for a certain market, the inquiry was closed.¹¹¹⁸ As a result of this iterative process, a total of 96 real estate agencies were identified as potential interview partners.
- (3) In the course of the main survey, all potential respondents were contacted, and structured telephone interviews were conducted on the basis of a questionnaire focusing on the assessment of up to three office property brands.

The questionnaire for the telephone interviews comprised three main sections:

- (A) Introduction: In a first step, participants were informed about the overall purpose and background of the study, the anonymization of the data, and the approximate length (30 minutes) of the interview. Afterward, an introductory question asking for the number of employees in their respective branch was given.
- (B) Selection of Property Brands: The second section focused on participants' unaided awareness of office property brands and their level of familiarity (indicator: *Overall Familiarity*). Out of the recalled list, the two property brands with the highest and the property brand with the lowest familiarity level were selected for the subsequent assessment of brand perceptions. In the case of equal familiarity levels, the selection was additionally based on the recall rank (indicator: *Recall Rank*) and the two brands with the highest and the one with the lowest score were selected.

¹¹¹⁶ The screening was limited to the first 100 offers displayed for each city.

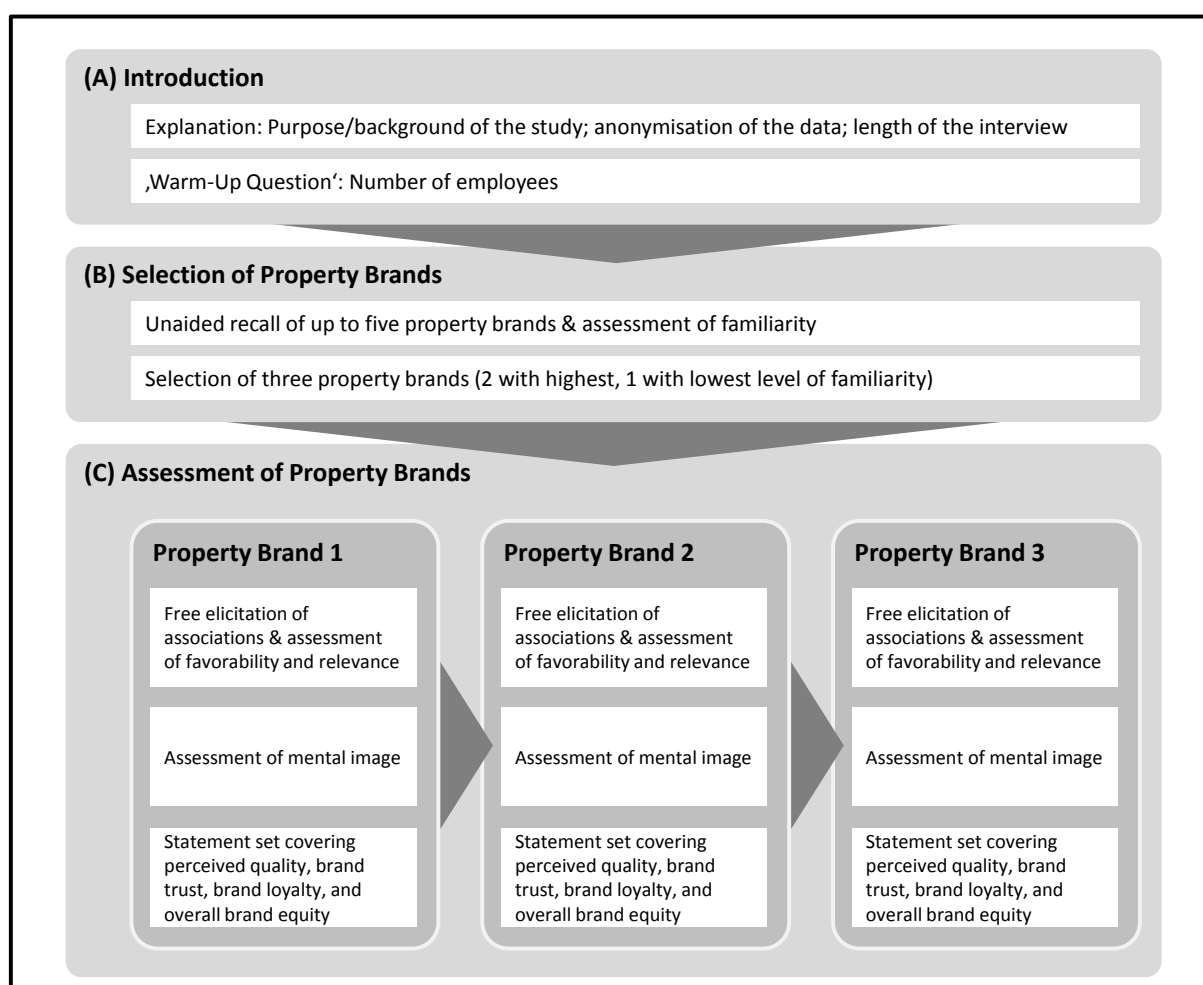
¹¹¹⁷ This result of the preliminary survey was not used in the empirical test of the brand equity model, since the main survey included an equivalent question.

¹¹¹⁸ Refer to Appendix 2 for the full questionnaire used in the presurvey.

- (C) Assessment of Property Brands: For each of the three property brands, the third section comprised three steps that followed a decreasing complexity regarding the level of activation and reflection required from respondents:¹¹¹⁹ the initial free elicitation of brand associations and the assessment of their favorability and relevance, questions focusing on participants' mental image of the brand, and a set of brand-related statements to be rated according to interviewees' level of agreement. In advance of respective assessment tasks, interview partners were asked to focus on the perspective of a potential office tenant.

Figure illustrates the structure of the telephone interviews. An overview of the underlying questionnaire is provided in Appendix 3.

Figure 25: Interview Structure



Source: Own illustration.

At this point, the choice of seven-point agreement scales for the majority of variables in this work should be briefly discussed. Rating scales are among the most widely-used scaling approaches across different fields of research due to their simplicity and versatility.¹¹²⁰

¹¹¹⁹ See, for instance, NASKRENT (2010), p. 230, who stated that participants' level of reflection and activation is substantially higher in the beginning of an interview.

¹¹²⁰ See WEIBER/MÜHLHAUS (2010), pp. 96-98; BORTZ (2005), p. 26.

They are based on respondent ratings with the help of prepared numerical values. One of the most common forms of rating scales is agreement or Likert scales – which are also applied in this study – on which study participants indicate their level of agreement with a certain statement. The scales are quasi-metric and thus fulfill the requirements of an interval scale for a causal analysis.¹¹²¹ For this reason, the scale used in this study does not violate the assumption of continuous variables, even if the measurement itself is discrete.¹¹²² Moreover, focusing on seven-point scales strikes a balance between an appropriate level of differentiation and complexity for the respondent.¹¹²³ However, agreement scales are not free of criticism. For instance, WEIBER/MÜHLHAUS (2010) stated that agreement scales require the formulation of extreme statements and allow for only an indirect measurement of participants' judgments. Moreover, ROSSITER (2002) has argued that the statement might be interpreted differently by respondents and a higher cognitive effort is needed.¹¹²⁴

Against this background, agreement scales were chosen for this study for reasons of simplicity and comparability, for they are commonly used in both real estate publications (e.g., MUSCHIOL (2008), PFNÜR/LOHSE (2008), JACKOB/ZERBACK/ARENS (2008)) and in the field of brand equity research.

4.6.2 Sample Description

Based on the set of 96 real estate agencies, 80 telephone interviews were conducted, representing a response rate of approximately 84.2%. In comparison to other studies in the field of real estate, this result is highly satisfactory and also exceeds the average response rate of approximately 35% for telephone interviews.¹¹²⁵ Establishing a personal contact through the presurvey, flexible interview arrangements, and follow-up calls mainly contributed to this result. Table provides an overview of the participation in the different cities. The group of respondents consisted of approximately 83% men and 17% women, corresponding to the average gender distribution at management level in the German real estate industry. A cooperative study by FRAUEN IN DER IMMOBILIENWIRTSCHAFT E.V./IVG (2012) on women's situation in real estate companies found a share of 21% female managers.¹¹²⁶ Figure illustrates participants' gender distribution in this study.

Regarding the structure of the real estate agencies, 50 (63%) of the participating branch offices employed fewer than 25 persons, 64 (80%) fewer than 50 persons, and only 6 (7%) had more than 100 employees. An illustration of the participating agencies by the number of their employees is provided in Figure .

¹¹²¹ See KROEBER-RIEL/WEINBERG/GRÖPPEL-KLEIN (2009), p. 194; ZINNBAUER/EBERL (2005), p. 566.

¹¹²² See BAGOZZI (1981), p. 380.

¹¹²³ See WEIBER/MÜHLHAUS (2010), p. 96.

¹¹²⁴ See ROSSITER (2002), p. 323.

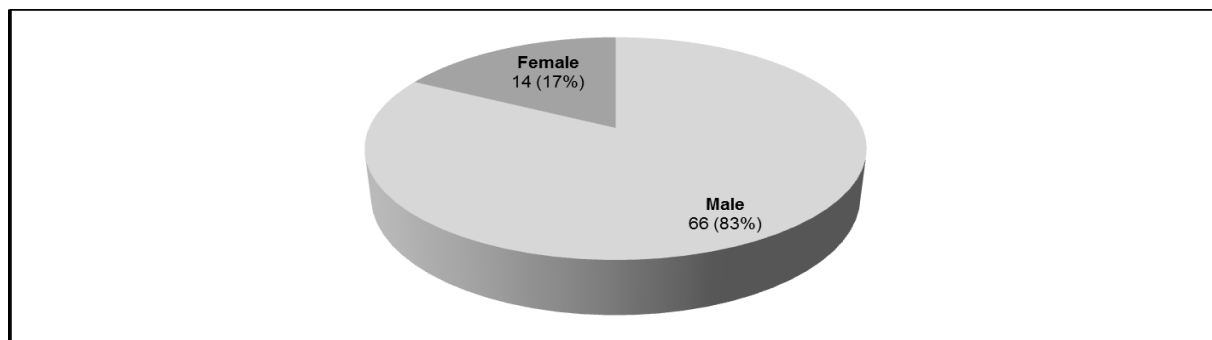
¹¹²⁵ See HOMBURG/FÜRST (2008), p. 620; STURM (2006), p. 111; ERTLE-STRAUB (2002), p. 190; BRADE (1998), p. 150.

¹¹²⁶ See FRAUEN IN DER IMMOBILIENWIRTSCHAFT E.V./IVG (2012), p. 4.

Table 28: Response Rate by City

	Number of relevant Interview Partners	Number of Responses	Response Rate
Berlin	11	11	100,0%
Dresden	10	9	90,0%
Düsseldorf	9	8	88,9%
Essen	5	4	80,0%
Frankfurt/Main	11	10	90,9%
Hamburg	10	8	80,0%
Cologne	8	6	75,0%
Leipzig	8	5	62,5%
Munich	14	10	71,4%
Stuttgart	9	9	100,0%
Total	95	80	84,2%

Source: Own illustration.

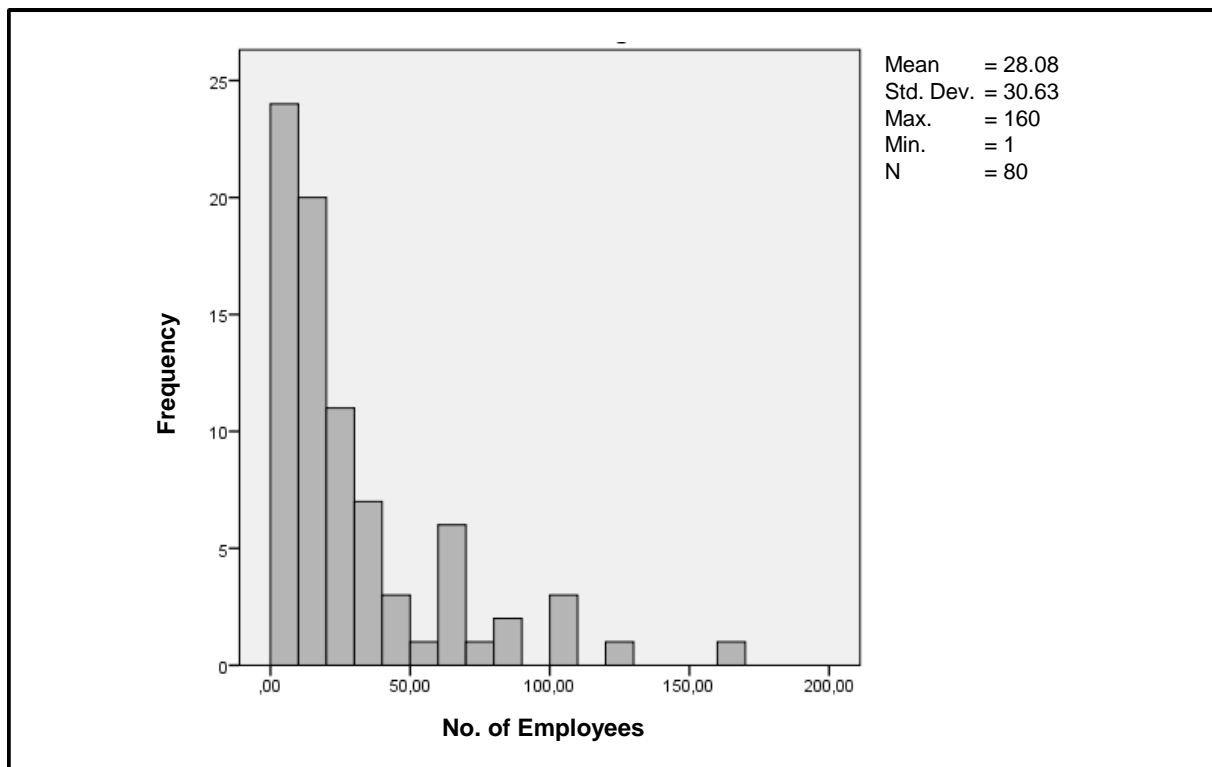
Figure 26: Overview: Gender Distribution of Study Respondants

Source: Own illustration.

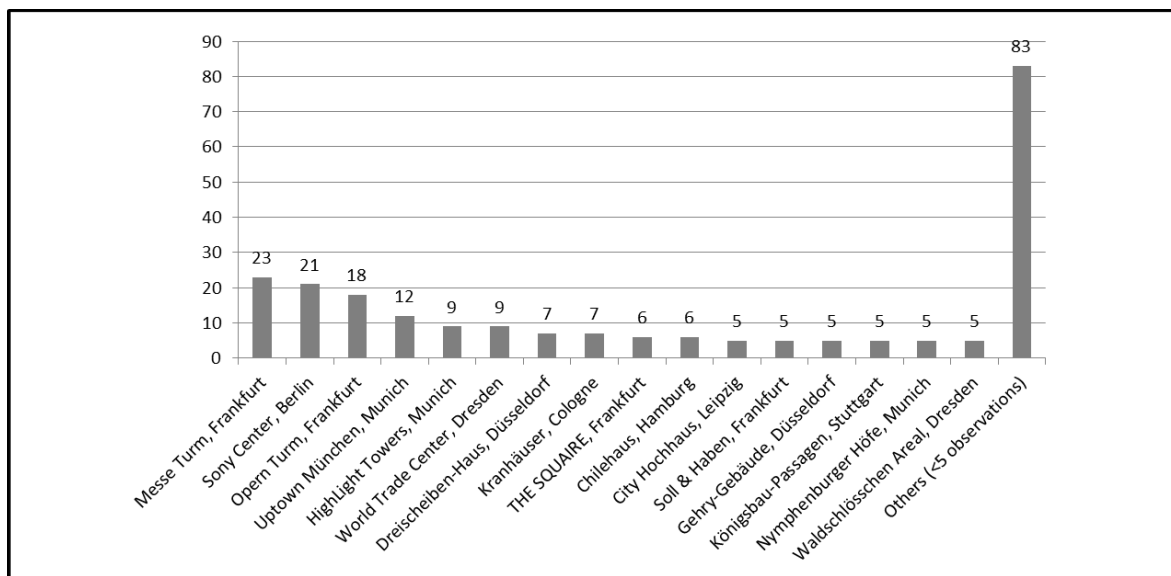
A total set of 231 complete assessments of 59 property brands was collected based on the telephone interviews. The potential number of 240 observations was not achieved, owing to premature interview terminations where only one or two property brands were assessed completely. In five cases the interview was terminated between two brand assessments, and in four cases respondents canceled the interview during the assessment of a brand owing to work-related interruptions and time restrictions, leading to missing values. The latter observations were eliminated from the sample since the questions for the respective brands were less than 75% complete.¹¹²⁷ Apart from those observations, the data set contained no missing values.

An average number of approximately four (3.9) observations per property brand were achieved. However, four property brands (Messe Turm, Sony Center, Opern Turm, and Uptown München) account for approximately 36% of the observations. Consequently, the study relies substantially on respondents' perceptions of these properties, which should be taken into account in the interpretation of the study results. Figure illustrates the number of observations by property brand.

¹¹²⁷ See DECKER/WAGNER (2008), p. 63; SCHNEIDER/KORNMEIER (2006), p. 122. HAIR et al. (2014), p. 51 suggested a cut-off value of 85% questionnaire completion.

Figure 27: Participating Real Estate Agencies by Number of Employees

Source: Own illustration.

Figure 28: Number of Observations by Property Brand

Source: Own illustration.

For the suggested structural model, the largest number of items in a formative construct is six, and the maximum number of structural paths directed at a particular construct is seven. Considering the sample size requirements for PLS-SEM discussed in section **Fehler! Verweisquelle konnte nicht gefunden werden.**, the number of observations in this study seems sufficient to detect minimum R^2 values of 0.10 in any of the endogenous constructs in the structural model for a significance level of 1%, assuming a level of statis-

tical power of 80%.¹¹²⁸ The sample size is also above the mean sample size (211.29) identified by HAIR et al. (2012) in their metastudy on the use of PLS-SEM in marketing research.¹¹²⁹

4.6.3 Preparation of the Data Set

The initial preparation and descriptive analysis of the data set regarding missing values, outliers, and distributional assumptions was conducted using the software SPSS Statistics 20.

The data set was checked for univariate outliers based on a visual examination of box plot diagrams. Outliers were detected in the case of eight indicators that were negatively skewed. Their share varied between 0.9% (Uniqueness) and 4.3% (Ease of Retrieval), and no observation had extreme values on more than three variables. Figure provides an overview of the corresponding boxplots.

Additionally, the data set was also examined for multivariate outliers based on a regression of the latent variable scores for overall brand equity on all indicators from latent variables preceding the construct. In accordance with the first study in this work, 11 observations with a Cook's distance higher than $4/(n-k-1)$ (where k is the number of independent variables and n is the size of the sample) were considered suspect and reviewed in more detail.¹¹³⁰ Following TABACHNICK/FIDELL's (2007) recommendation, a dummy variable for the outlier status was introduced (0 = no outlier, 1 = outlier), and a regression was applied using all variables as predictors of the outlier status in order to identify the variables that distinguish the multivariate outliers from the rest of the data set.¹¹³¹ No significant relationships were found between the independent variables and the outlier status, implying that there are no single variables characterizing outliers.

Altogether, a case-wise individual examination of all univariate and multivariate outliers showed that they did not result from erroneous data entries and represented unusual but probable assessments of property brands that fit the objectives of this work. Moreover, there was no strong reason to believe that the respondents form a distinct subgroup that does not belong to the study population. Consequently, the observations designated as outliers seem similar enough to the remaining observations, and the corresponding data was retained unchanged.

PLS-SEM is generally considered to be robust against violations of normal distribution, and according to a meta-analysis by HAIR et al. (2012), only 9.3% of publications in the top 30 marketing journals had reported the extent of nonnormality.¹¹³² However, recent studies, such as JANNOO et al. (2014), have indicated that the approach does not neces-

¹¹²⁸ For these specifications, HAIR et al. (2014), p. 21 (based on COHEN (1992), pp. 155-159) suggested a minimum sample size of 228 observations. Statistical power refers to the ability of a test to detect an effect, if the effect actually exists. Reversely, a statistical power of 80% indicates a likelihood of 20% for a type II error where the null hypothesis is false but erroneously fails to be rejected. (See HELD (2009), p. 171.)

¹¹²⁹ See HAIR et al. (2012), p. 420.

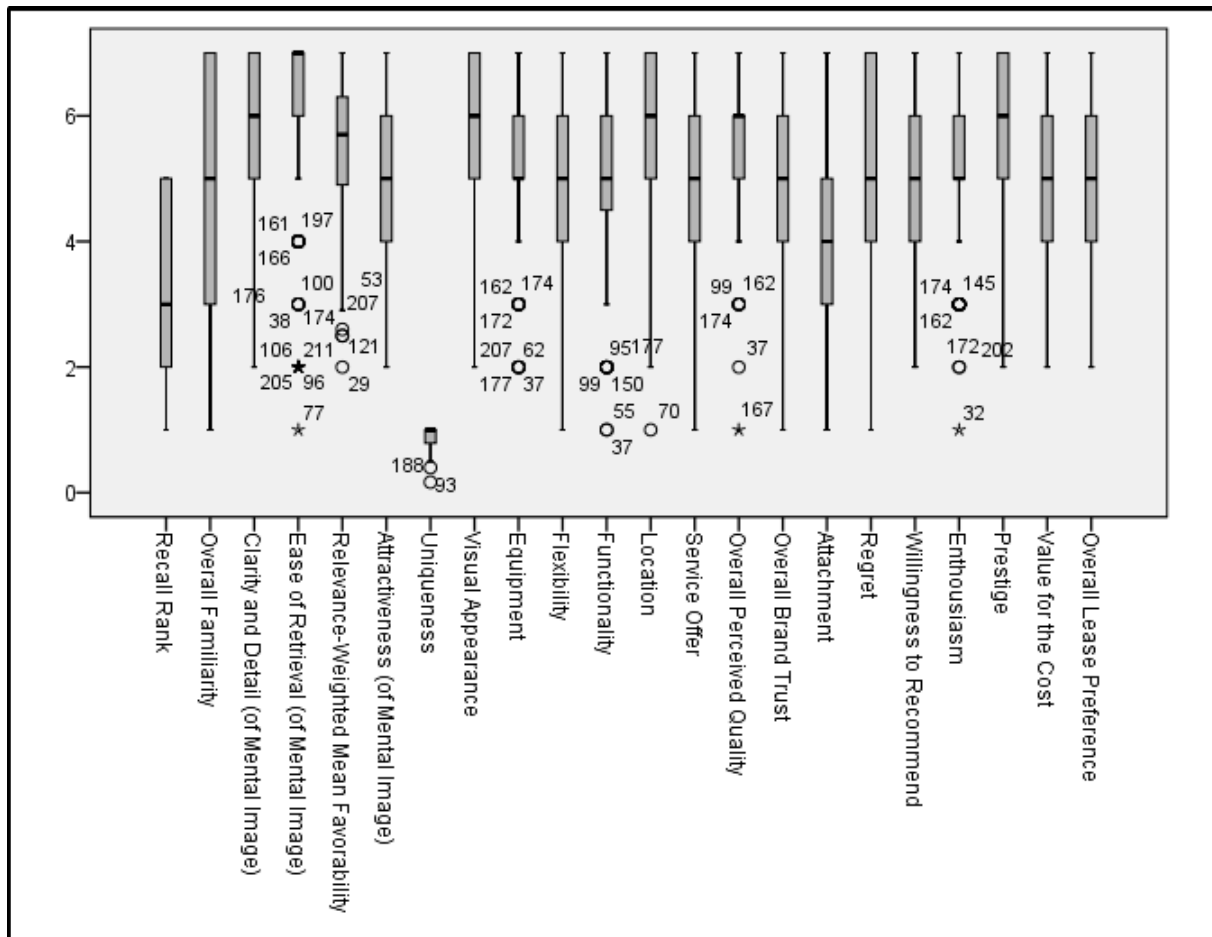
¹¹³⁰ See HAIR et al. (2010a), p. 11; TABACHNICK/FIDELL (2007), p. 75.

¹¹³¹ See TABACHNICK/FIDELL (2007), p. 76.

¹¹³² See HAIR et al. (2012), p. 421.

sarily provide more precise results than CB-SEM under nonnormal conditions.¹¹³³ Similarly, HAIR et al. (2014) conceded that it is important to ensure that the data are not excessively far from normal, since they might lead to standard-error inflation and a corresponding decrease in the likelihood that relationships are identified as being significant.

Figure 29: Overview of Box Plots



Source: Own illustration.

Consequently, a visual inspection of histograms under consideration of skewness and kurtosis values was conducted for all variables. The examination showed that a majority of variables are approximately normally distributed and meet common requirements for skewness (± 1) and kurtosis (± 3).¹¹³⁴ However, in five cases, the deviation regarding skewness exceeds this strict range, although it is still within a more lenient range of ± 2 , which is suggested, for instance, by CURRAN/WEST/FINCH (1996).¹¹³⁵ Clarity and Detail, Ease of Retrieval, Uniqueness, and Visual Appearance are negatively skewed and leptokurtic, whereas Overall Perceived Quality only shows signs of a positive deviation of kurtosis. Altogether, taking into account the robustness of PLS-SEM regarding nonnormality, the suggested ranges for skewness and kurtosis, and the central limit theorem, the deviations from normal distribution seem acceptable and all indicators are retained in the mod-

¹¹³³ See JANNOO et al. (2014), p. 290.

¹¹³⁴ GARSON (2012), pp. 18-20. Note that SPSS uses Fisher kurtosis, which is centered at 0.

¹¹³⁵ See CURRAN/WEST/FINCH (1996), p. 26.

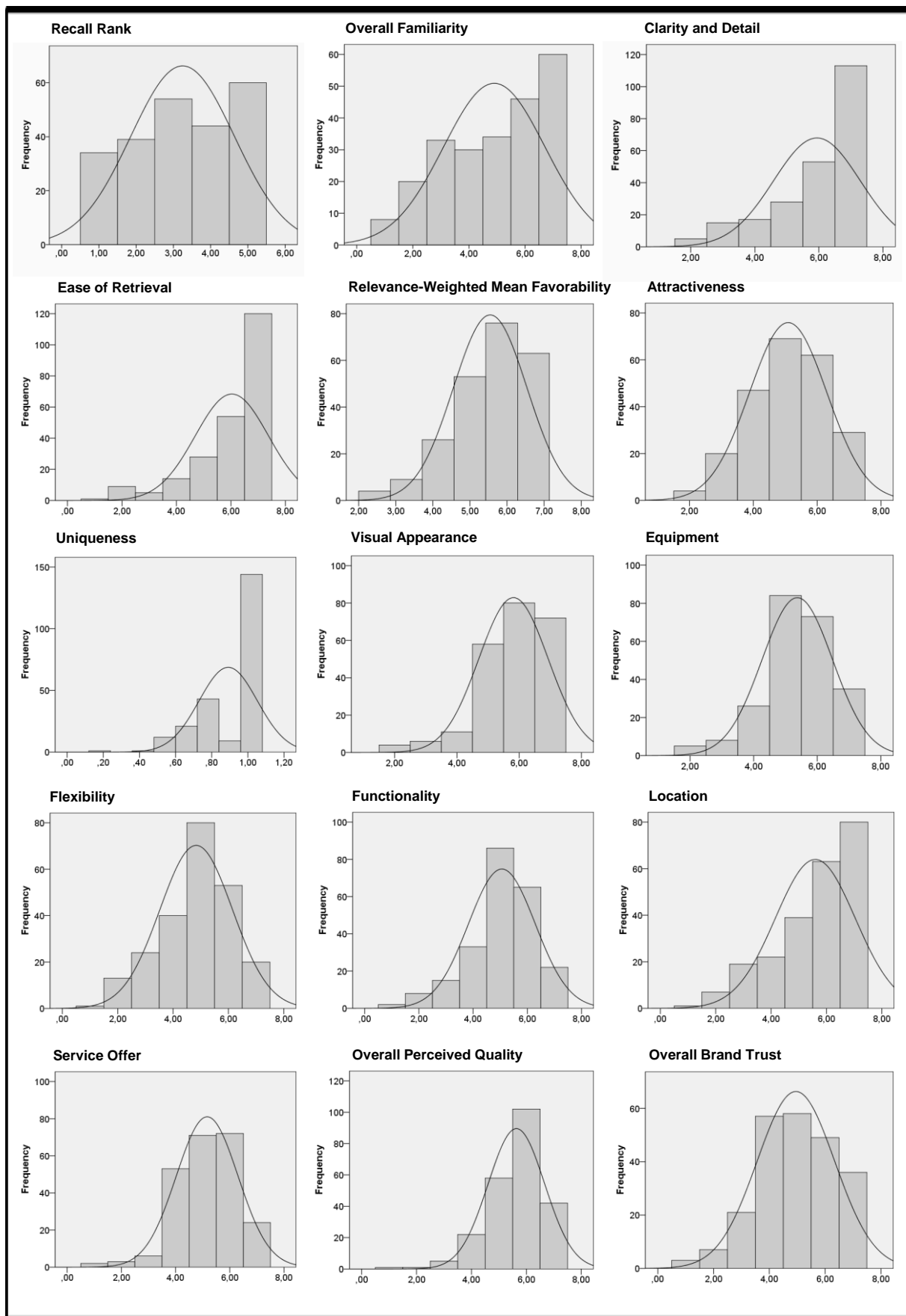
el. Table provides an overview of mean, skewness, and kurtosis values for all indicators. The corresponding histograms are summarized in Figure and Figure .

Table 29: Overview of the Data Set

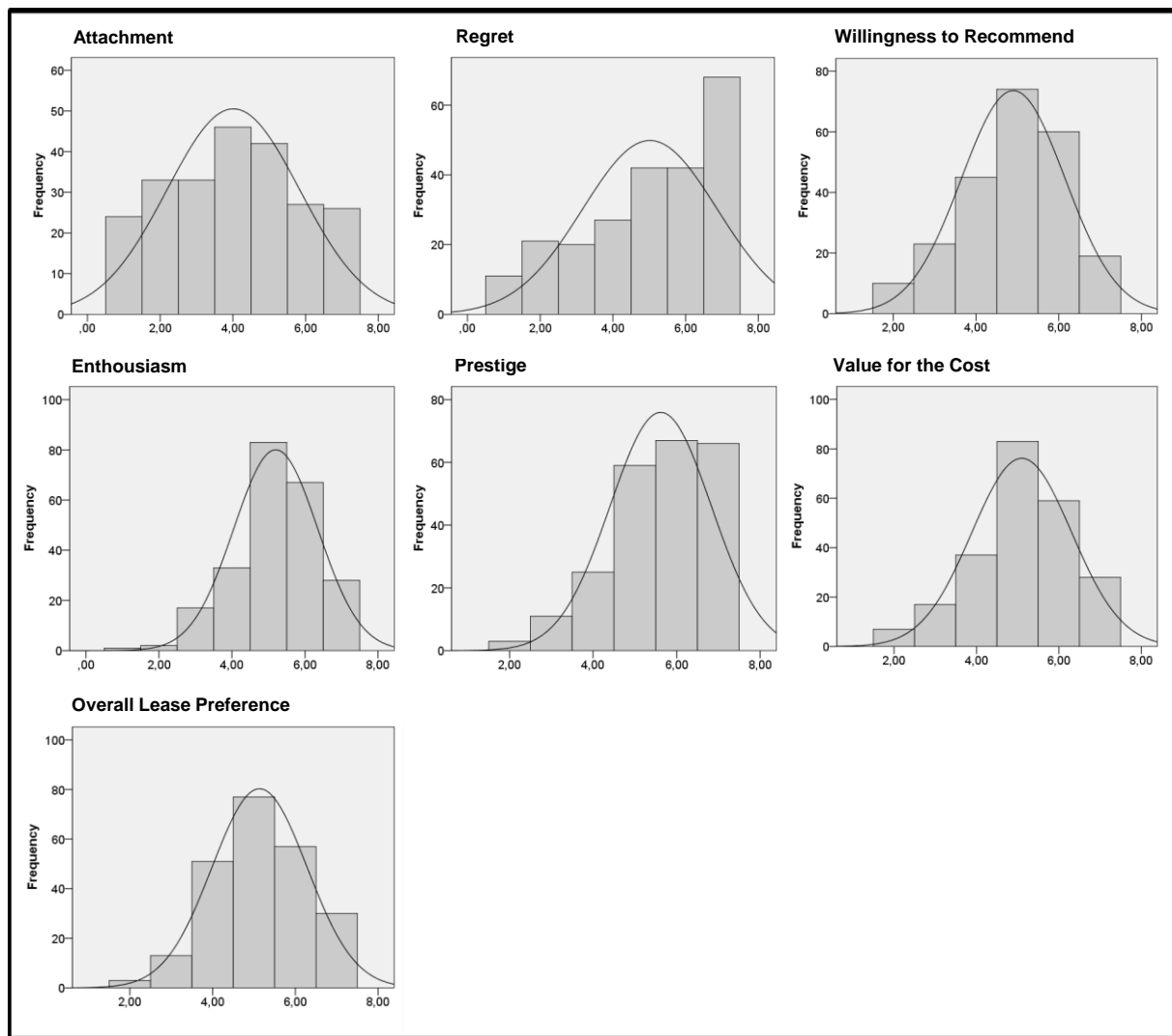
Construct	Indicator	Minimum	Maximum	Mean	Std. Dev.	Skewness	Kurtosis
Brand Awareness	Recall Rank	1.00	5.00	3.25	1.39	-0.20	-1.20
Brand Familiarity	Overall Familiarity	1.00	7.00	4.90	1.81	-0.45	-0.98
Accessibility (of Brand Associations)	Clarity and Detail (of the Mental Image)	2.00	7.00	5.94	1.36	-1.23	0.56
	Ease of Retrieval (of the Mental Image)	1.00	7.00	6.03	1.35	-1.61	2.14
Valence (of Brand Associations)	Relevance-Weighted Mean Favorability	2.00	7.00	5.55	0.99	-0.90	0.71
	Attractiveness (of the Mental Image)	2.00	7.00	5.09	1.21	-0.28	-0.49
Uniqueness (of Brand Associations)	Uniqueness	0.17	1.00	0.89	0.16	-1.40	1.50
Perceived Quality	Visual Appearance	2.00	7.00	5.82	1.11	-1.07	1.38
	Equipment	2.00	7.00	5.37	1.11	-0.64	0.62
	Flexibility	1.00	7.00	4.84	1.31	-0.46	-0.20
	Functionality	1.00	7.00	5.06	1.23	-0.75	0.68
	Location	1.00	7.00	5.60	1.44	-0.92	0.01
	Service Offer	1.00	7.00	5.16	1.14	-0.58	0.79
	Overall Perceived Quality	1.00	7.00	5.64	1.03	-0.96	1.71
Brand Trust	Overall Brand Trust	1.00	7.00	4.95	1.39	-0.34	-0.28
Brand Loyalty	Attachment	1.00	7.00	4.01	1.82	-0.01	-0.99
	Regret	1.00	7.00	5.02	1.85	-0.63	-0.73
	Willingness to Recommend	2.00	7.00	4.90	1.25	-0.40	-0.33
Overall Brand Equity	Enthusiasm	1.00	7.00	5.20	1.15	-0.52	0.28
	Prestige	2.00	7.00	5.62	1.21	-0.69	-0.04
	Value for the Cost	2.00	7.00	5.10	1.21	-0.45	-0.05
	Overall Lease Preference	2.00	7.00	5.13	1.15	-0.18	-0.36

Source: Own illustration.

Figure 30: Overview of the Data Set – Histograms (Part 1)



Source: Own illustration.

Figure 31: Overview of the Data Set – Histograms (Part 2)

Source: Own illustration.

A brief examination of the variables regarding their value ranges and means showed that the scales were mostly used to their full extent and that the majority of indicators have a mean well above the medium score of 4.0. Especially the accessibility indicators (Clarity and Detail: 5.9; Ease of Retrieval: 6.0) reflect that, for an average observation, respondents could easily retrieve a clear and detailed mental image of the subject property brand from memory. Similarly, quality perceptions were mainly in the upper range of the seven-point scale, with Flexibility being the only indicator with a mean below 5.0. Consequently, the average property seems to have a more-than-medium quality in the eyes of the respondents. In the same way, the mean favorability of brand associations seems to be positive, and the average attractiveness of a brand's mental image is also above 5.0. For Overall Brand Trust, a mean value of approximately 5.0 was calculated, indicating a generally positive level of trust in the subject property brands. The observation mean for the uniqueness of brand associations is considerably high (0.89), which might be a reflection of properties' inherent uniqueness resulting in a high proportion of brand-specific associations. Mean values for the indicators of brand loyalty range from 4.0 to 5.0, thus suggesting a moderate intrinsic bond with the subject brands. Finally, mean indicator values for

the manifest measurements of Overall Brand Equity are within a range from 5.0 to 5.6. Consequently, on average, respondents seem to attribute comparably high levels of prestige, enthusiasm, and value to the property brands and clearly have some confidence in the decision to lease in the respective buildings.

Finally, in order to explore whether there are significant differences in brand assessments between male and female study participants, a simple independent group *t*-test with unequal variances was conducted.¹¹³⁶ However, a significant ($p < 0.05$) difference between the male group (4.97) and the female group (5.48) was found only in the case of their mean perceptions regarding properties' functionality. Consequently, men and women are not further considered as different groups of respondents in this study.¹¹³⁷ Appendix 4 provides an overview of the *t*-test results.

4.7 Assessment of Measurement Models

In this chapter, the reflective and formative measurement models for the proposed dimensions are assessed on the basis of the quality criteria outlined in section **Fehler! Verweisquelle konnte nicht gefunden werden.** and **Fehler! Verweisquelle konnte nicht gefunden werden.** For reasons of completeness, the suggested single-item constructs are included in illustrations and tables but not discussed in detail, since the assessment criteria are not applicable. The model was estimated with the SmartPLS 3.0 software.¹¹³⁸ Bivariate correlations were calculated with the help of SPSS 20.

4.7.1 Reflective Measurement Models

Reflective measurement models were evaluated in terms of their internal consistency, indicator reliability, convergent validity, and discriminant validity. All suggested constructs were found to have a satisfactory level of internal consistency. Values for composite reliability ranged from 0.834 to 0.944 and even exceeded the required thresholds of 0.7 for more advanced stages of research. In fact, a value of 0.944 in the case of brand associations' accessibility must be seen critically, for it indicates that the indicator variables might measure exactly the same phenomenon, possibly leading to an inflation in error term correlations and bringing into question the measures' content validity. However, as was described in section **Fehler! Verweisquelle konnte nicht gefunden werden.**, imagery theory clearly suggests that both indicators are relevant reflections of customers' mental images. Moreover, the formulations of the corresponding questions were distinctively phrased, thus speaking against the possibility that high levels of linguistic similarity might be the underlying reason. Likewise, taking into consideration that the value was still below

¹¹³⁶ See RABE-HESKETH/SKRONDAL (2012), pp. 12-17.

¹¹³⁷ A multigroup causal analysis differentiating between the two groups is not carried out in the course of the analysis. Due to the small size (17 participants, 40 observations) of the female group, sample size requirements are met only for detecting R^2 values larger than 0.75 for a significance level of 10%, assuming a statistical level of power of 80%. See HAIR et al. (2014), p. 21 based on COHEN (1992), pp. 155-159.

¹¹³⁸ Initial outer weights were set to +1. The PLS algorithm converged after 9 iterations with a stop criterion of 10^{-7} .

the more lenient threshold of 0.95 suggested by HAIR et al. (2014), the indicators for Accessibility were retained unchanged.¹¹³⁹

Convergent validity is established by considering the average variance extracted and examining the outer loadings of the indicators. Regarding indicator reliability, the indicators for all reflective constructs showed significant ($p < 0.001$) standardized outer loadings well above 0.7, suggesting that all latent variables explained a substantial part (>50%) of their indicators' variance.¹¹⁴⁰ Equivalently, no violations of the requirement for an average extracted variance above 0.5 were detected. In fact, the suggested constructs exceeded even the more rigorous threshold of 0.6.¹¹⁴¹ Thus, it can be assumed that on average, all constructs explain more than half of the variance of their indicators. Outer loadings, composite reliability values, and average variance extracted are summarized in Table below. The complete bootstrapping output for the outer loadings including sample mean, standard errors, and t -statistics is provided in Appendix 5.

Table 30: Reflective Measurement Models – Outer Loadings, Composite Reliability, and Average Variance Extracted

Construct	Indicator	Outer Loadings	p-Values	95% Confidence Interval (Bias Corrected)	Composite Reliability	AVE	Assessment
Brand Awareness	RecallRank	1.000	0.000	-	1.000	1.000	Single-Item Construct
Brand Familiarity	Overall Familiarity	1.000	0.000	-	1.000	1.000	Single-Item Construct
Accessibility (of Brand Associations)	Clarity and Detail (of Mental Image)	0.949	0.000	[0.928, 0.964]	0.944	0.894	(Acceptable)
	Ease of Retrieval (of Mental Image)	0.942	0.000	[0.917, 0.959]			
Valence (of Brand Associations)	Relevance-Weighted Mean Favorability	0.874	0.000	[0.832, 0.901]	0.848	0.736	Acceptable
	Attractiveness (of Mental Image)	0.842	0.000	[0.779, 0.879]			
Uniqueness (of Brand Associations)	Uniqueness	1.000	0.000	-	1.000	1.000	Single-Item Construct
Brand Trust	Overall Brand Trust	1.000	0.000	-	1.000	1.000	Single-Item Construct
Brand Loyalty	Attachment	0.810	0.000	[0.745, 0.857]	0.834	0.626	Acceptable
	Regret	0.749	0.000	[0.675, 0.801]			
	Willingness to Recommend	0.813	0.000	[0.766, 0.845]			
Overall Brand Equity	Enthusiasm	0.858	0.000	[0.818, 0.887]	0.882	0.652	Acceptable
	Prestige	0.778	0.000	[0.722, 0.820]			
	Value for the Cost	0.740	0.000	[0.658, 0.798]			
	Overall Lease Preference	0.847	0.000	[0.806, 0.878]			

Source: Own illustration.

Constructs' discriminant validity was assessed by applying the Fornell-Larcker criterion and examining indicators' cross loadings with other latent variables. The requirements concerning the Fornell-Larcker criterion were met in all cases, with all constructs' correlations being well below the square root of AVE values. Consequently, it can be assumed that the proposed latent variables share more variance with their associated indicators than with any other construct. Table on page 248 summarizes the square root of AVE values and latent variable correlations.

¹¹³⁹ See HAIR et al. (2014), p. 102.

¹¹⁴⁰ In order to obtain p -values (two-tailed), a bootstrapping procedure was carried out using 5,000 subsamples. Sign changes in the resamples were ignored. (A tentative use of less conservative sign change options, e.g., construct level sign changes and individual sign changes, did not lead to different significance levels.)

¹¹⁴¹ See HUBER/WEIHRAUCH/WEINDEL (2012), p. 44.

Table 31: Reflective Measurement Models – Fornell-Larcker Criterion

	Brand Awareness	Brand Familiarity	Accessibility of Brand Associations	Valence of Brand Associations	Uniqueness of Brand Associations	Perceived Quality	Brand Trust	Brand Loyalty	Overall Brand Equity	Assessment
Brand Awareness	Single-Item Construct									Single-Item Construct
Brand Familiarity	-0.006	Single-Item Construct								Single-Item Construct
Accessibility of Brand Associations	0.017	0.533	0.946							Acceptable
Valence of Brand Associations	-0.048	0.221	0.256	0.858						Acceptable
Uniqueness of Brand Associations	0.013	0.197	0.275	0.092	Single-Item Construct					Single-Item Construct
Perceived Quality	0.036	0.166	0.189	0.574	-0.026	Formative Construct				Formative Construct
Brand Trust	-0.075	0.306	0.214	0.349	0.106	0.403	Single-Item Construct			Single-Item Construct
Brand Loyalty	-0.056	0.485	0.461	0.579	0.207	0.499	0.566	0.791		Acceptable
Overall Brand Equity	0.011	0.213	0.159	0.634	0.094	0.683	0.522	0.676	0.807	Acceptable

Note: The square root of AVE values is shown on the diagonal (reflective constructs only); nondiagonal elements are the latent variable correlations.

Source: Own illustration.

Similarly, all indicators' outer loadings on their associated constructs were greater than their loadings on any other latent variable, providing support for discriminant validity.¹¹⁴²

However, it must be stated that a minimum difference of 0.2 or 0.1 between the outer loading and the highest cross loading of an indicator, which is applied by some authors (e.g., GÄNSWEIN (2011), NEUFELD/WAN/FANG (2010)), was not achieved in all cases.¹¹⁴³

Willingness to Recommend (outer loading: 0.813) had a cross loading of 0.738 on Overall Brand Equity, and Overall Lease Preference (outer loading: 0.847) had a cross loading of 0.705 on Brand Loyalty, indicating that the two constructs might partially share a common domain. Nonetheless, the basic requirement regarding cross loadings was met, and the Fornell-Larcker criterion, which is considered more conservative than the cross loadings, did not indicate violations of discriminant validity.¹¹⁴⁴ Consequently, all indicators and reflective constructs were retained unchanged. **Fehler! Ungültiger Eigenverweis auf Textmarke.** on page 248 provides a summary of indicators' cross loadings.

¹¹⁴² See SARSTEDT/WILCZYNSKI/MELEWAR (2013), p. 334; HOMBURG/KEBBEL (2001), p. 51.

¹¹⁴³ See GÄNSWEIN (2011), p. 183; NEUFELD/WAN/FANG (2010), p. 236.

¹¹⁴⁴ See HAIR et al. (2014), p. 105.

Table 32: Reflective (and Formative) Measurement Models – Cross Loadings

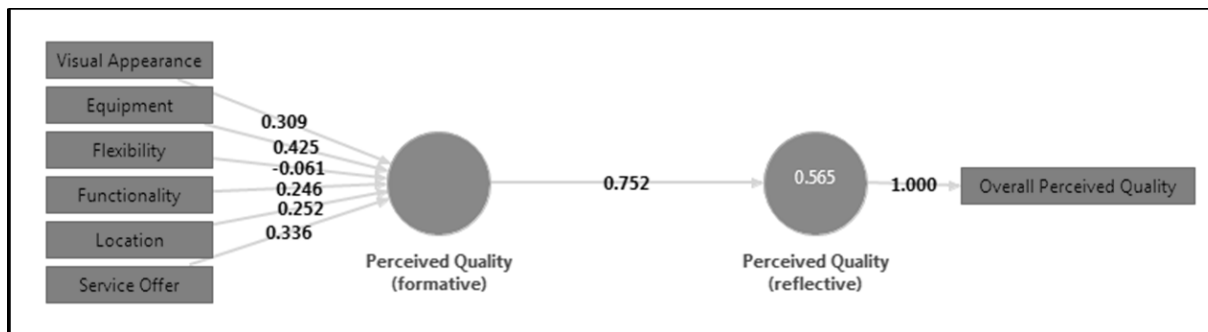
Construct	Indicator	Brand Awareness	Brand Familiarity	Accessibility of Brand Associations	Valence of Brand Associations	Uniqueness of Brand Associations	Perceived Quality	Brand Trust	Brand Loyalty	Overall Brand Equity	Assessment
Brand Awareness	RecallRank	1.000	-0.006	0.017	-0.048	0.013	0.036	-0.075	-0.056	0.011	Single-Item Construct
Brand Familiarity	Overall Familiarity	-0.006	1.000	0.533	0.221	0.197	0.166	0.306	0.485	0.213	Single-Item Construct
Accessibility (of Brand Associations)	Clarity and Detail	-0.001	0.531	0.949	0.231	0.299	0.196	0.218	0.428	0.147	Acceptable
	Ease of Retrieval (of Mental Image)	0.035	0.475	0.942	0.254	0.219	0.160	0.187	0.443	0.154	Acceptable
Valence (of Brand Associations)	Relevance-Weighted Mean Favorability	-0.027	0.094	0.126	0.874	0.042	0.554	0.308	0.475	0.639	Acceptable
	Attractiveness (of Mental Image)	-0.057	0.297	0.324	0.842	0.120	0.424	0.291	0.522	0.438	Acceptable
Uniqueness (of Brand Associations)	Uniqueness	0.013	0.197	0.275	0.092	1.000	-0.026	0.106	0.207	0.094	Single-Item Construct
Perceive Quality	Visual Appearance	0.009	0.186	0.257	0.468	0.022	0.700	0.273	0.410	0.377	Formative Construct
	Equipment	0.028	0.044	0.036	0.374	-0.008	0.620	0.273	0.251	0.447	Formative Construct
	Flexibility	-0.030	0.074	0.024	0.316	-0.053	0.604	0.256	0.304	0.433	Formative Construct
	Functionality	-0.049	0.006	-0.003	0.226	-0.130	0.521	0.202	0.254	0.419	Formative Construct
	Location	0.054	0.047	0.031	0.354	-0.049	0.570	0.140	0.211	0.477	Formative Construct
	Service	0.057	0.079	0.104	0.239	-0.001	0.612	0.360	0.299	0.452	Formative Construct
Brand Trust	Overall Brand Trust	-0.075	0.306	0.214	0.349	0.106	0.403	1.000	0.566	0.522	Single-Item Construct
Brand Loyalty	Attachment	-0.106	0.442	0.422	0.403	0.127	0.278	0.403	0.810	0.406	Acceptable
	Regret	-0.035	0.436	0.443	0.447	0.233	0.254	0.352	0.749	0.374	Acceptable
	Willingness to Recommend	-0.008	0.312	0.274	0.507	0.144	0.574	0.547	0.813	0.738	(Acceptable)
Overall Brand Equity	Enthusiasm	-0.050	0.111	0.076	0.546	0.124	0.558	0.405	0.542	0.858	Acceptable
	Prestige	0.053	0.063	0.071	0.532	0.034	0.579	0.350	0.420	0.778	Acceptable
	Value for the Cost	0.029	0.159	0.113	0.431	0.040	0.424	0.414	0.487	0.740	Acceptable
	Overall Lease Preference	0.009	0.328	0.237	0.530	0.093	0.625	0.506	0.705	0.847	(Acceptable)

Source: Own illustration.

4.7.2 Formative Measurement Models

Perceived Quality is assessed regarding its nomological and convergent validity and the collinearity, significance, and relevance of its items. In order to test for convergent validity, Overall Perceived Quality was obtained as a reflective measurement of respondents' quality perception. The estimated path coefficient between the formatively measured construct and the reflectively measured construct was estimated 0.752; R^2 for the reflective construct was 0.565. Obviously, the more lenient requirement of a minimum path coefficient of 0.7 was met, indicating that more than half of the variance of the reflective measure is explained by its formative counterpart.¹¹⁴⁵ Nevertheless, the explained variance is below the threshold of 0.9 suggested by HAIR et al. (2014), implying that there is still room for theoretical and conceptual refinement. However, as this study represents an early stage of research in the fields of brand equity and quality perceptions in a property context, and considering that the reflective measurement was based on a single indicator, the construct seems to have an acceptable level of convergent validity. Moreover, within the suggested path model, the construct behaves as expected, additionally supporting its nomological validity. Figure illustrates the result of the path model estimation.

¹¹⁴⁵ See HAIR et al. (2014), p. 121; DIAMANTOPOULOS/SIGUAW (2006), pp. 270-272; WINKLHOFFER/DIAMANTOPOULOS (2002), pp. 153-160.

Figure 32: Formative Measurement Model – Redundancy Analysis (1)

Source: Own illustration.

In the next step, the formative construct was assessed for potential collinearity issues based on an examination of items' variance inflation factor and their bivariate correlations with each other and the latent variable. The variance inflation factor was below 3 in all cases; thus, DIAMANTOPOULOS/SIGUAW's (2006) conservative cut-off criterion of approximately 3.33 was met.¹¹⁴⁶ However, it should be noted that Flexibility and Functionality show values above 2, which indicates that a considerable share of their variances is explained by other indicators. Table summarizes the variance inflation factor values.

Table 33: Formative Measurement Model – Variance Inflation Factor (1)

Item	VIF	Assessment
Visual Appearance	1.213	Acceptable
Equipment	1.833	Acceptable
Flexibility	2.190	Acceptable
Functionality	2.033	Acceptable
Location	1.070	Acceptable
Service Offer	1.243	Acceptable

Source: Own illustration.

Following HAIR et al.'s (2014) suggestion, all items were examined regarding their relative and absolute contribution to Perceived Quality. For this purpose, outer weights (equivalent to their individual regression coefficients) and outer loadings (equivalent to their bivariate correlation with the construct) were checked for significance.¹¹⁴⁷ Table shows that all items have significant outer loadings, implying that they all individually contribute relevant information to the index.

However, it should be noted that Functionality is just slightly above the threshold of 0.5 suggested by HAIR et al. (2014).¹¹⁴⁸ Items' relative contribution to the latent variable is less unanimous. The outer weights of Equipment and Functionality are nonsignificant, implying that both items have a low relevance when all other items are considered. In the case of Equipment, the item can be interpreted as being absolutely but not relatively important and should be retained in the model, for its outer loading is well above 0.5. Functionality

¹¹⁴⁶ See DIAMANTOPOULOS/SIGUAW (2006), p. 270.

¹¹⁴⁷ In order to obtain *p*-values (two-tailed), a bootstrapping procedure was carried out using 5,000 subsamples. Sign changes in the resamples were ignored. (A tentative use of less conservative sign change options, e.g., construct level sign changes and individual sign changes, did not lead to different significance levels.)

¹¹⁴⁸ See HAIR et al. (2014), p. 129; CENFETELLI/BASSELIER (2009), pp. 696-697.

deserves more attention since its outer loading is only slightly above the proposed threshold and the sign change between its absolute (0.521) and its relative (−0.001) contribution might indicate a suppressor effect.¹¹⁴⁹

Table 34: Formative Measurement Model – Outer Weights and Outer Loadings (1)

Item	Outer Weights	p-value	95% Confidence Interval (bias corrected)	Outer Loadings	p-value	95% Confidence Interval (bias corrected)	Assessment	
							Absolutely important	Relatively important
Visual Appearance	.522***	.000	[.374, .687]	.700***	.000	[.582, .821]	x	x
Equipment	.022	.827	[−.162, .222]	.620***	.000	[.474, .765]	x	
Flexibility	.327**	.008	[.104, .553]	.604***	.000	[.448, .737]	x	x
Functionality	−.001	.993	[−.202, .202]	.521***	.000	[.346, .670]	x	
Location	.399***	.000	[.264, .588]	.570***	.000	[.436, .749]	x	x
Service Offer	.320***	.000	[.130, .474]	.612***	.000	[.480, .742]	x	x

* significant at $p < 0.05$ ** significant at $p < 0.01$ *** significant at $p < 0.001$

Source: Own illustration.

Indeed, an examination of the bivariate correlations between the items in Table demonstrates that Functionality has a bivariate correlation with Flexibility that exceeds both items' individual outer loading on Perceived Quality. Together with the sign change and the increased variance inflation factor, this situation indicates a suppressor effect, where the weight of the item that has a lower correlation with the construct (Functionality) is reduced by the item that has a higher correlation with the construct (Flexibility). Even if the collinearity between the two items is below the critical threshold of 0.8 suggested by CENFETELLI/BASSELIER (2009) and slightly below the threshold of 0.7 proposed by CASSEL et al. (1999), it leads to a decrease in the relative importance of Functionality, which becomes insignificant.¹¹⁵⁰ Consequently, the interpretation is contradictory: The outer loading of the item shows that higher levels of Functionality are associated with higher levels of Perceived Quality, whereas the outer weight states that there is no significant relation between the variables.

Table 35: Formative Measurement Model – Correlations

	Visual Appearance	Equipment	Flexibility	Functionality	Location	Service Offer
Visual Appearance	1					
Equipment	.414**	1				
Flexibility	.206**	.573**	1			
Functionality	.202**	.501**	.687**	1		
Location	.109	.208**	.133*	.151*	1	
Service Offer	.182**	.350**	.327**	.377**	.208**	1

* significant at $p < 0.05$ ** significant at $p < 0.01$

Source: Own illustration.

According to CENFETELLI/BASSELIER's (2009) argument, the extent of multicollinearity in the formative measurement model does not necessarily require the elimination of the item,

¹¹⁴⁹ See HAIR et al. (2014), pp. 123-124.

¹¹⁵⁰ See CENFETELLI/BASSELIER (2009), p. 697; CASSEL et al. (1999), pp. 443-444.

since all correlations are below 0.8. However, the absolute relevance of Functionality seems to be comparably low and is just above the threshold of 0.5. Moreover, from a conceptual perspective, there might be an overlap between Functionality and Flexibility. In fact, it might be difficult for tenants to differentiate between the two quality facets, since an office property's overall adaptability to the needs of its users might also be considered as being the basis of its functionality in terms of supporting tenants' individual core business. In other words, if an office property is not capable of adapting its technical and spatial features to the needs of its tenants, it will also not be capable of effectively contributing to their business processes. This view is also supported by real estate publications such as POMMERANZ (2008) that do not explicitly differentiate between functionality and flexibility but suggest a combined understanding of the two aspects.¹¹⁵¹

Altogether, considering the comparably low absolute importance of Functionality, its high correlation with Flexibility, its insignificance in terms of relative importance, and the conceptual and technical proximity of a building's flexibility and functionality, it seemed justifiable from a content validity point of view to remove the item from the indicator set for reasons of interpretability and in order to reduce standard-error inflation arising from collinearity.¹¹⁵²

After eliminating the Functionality item, the full model was re-estimated since the removal might have led to changes in the inner and outer model loadings and weights due to the highly interrelated nature of variables in SEM analyses.¹¹⁵³ However, apart from the measurement model of the Perceived Quality construct, no changes were detected in the measurement models or the structural model. Consequently, only the formative model was reassessed regarding its convergent validity and the variance inflation factor and outer loadings of its indicators, since those aspects depend on the composition of the indicator set.

According to the redundancy analysis, the removal of Functionality decreased the path coefficient between the formative and the reflective construct only slightly. The path coefficient was estimated at 0.741 and R^2 at 0.548. Taking into account the early stage of research, the formative construct has an acceptable level of convergent validity and continues to behave as expected within the overall brand equity model, which supports the notion of nomological validity. Figure illustrates the corresponding path model.

The variance inflation factor was now below 2 for all items, indicating that no critical level of collinearity was prevalent in the measurement model. For Flexibility, the variance inflation factor was further reduced (1.535). Table summarizes the corresponding results.

Apart from Flexibility, which saw a slight decrease in its outer weight (0.326), the items showed no changes in their relative importance. Thus, their overall assessment did not

¹¹⁵¹ See POMMERANZ (2008), p. 52.

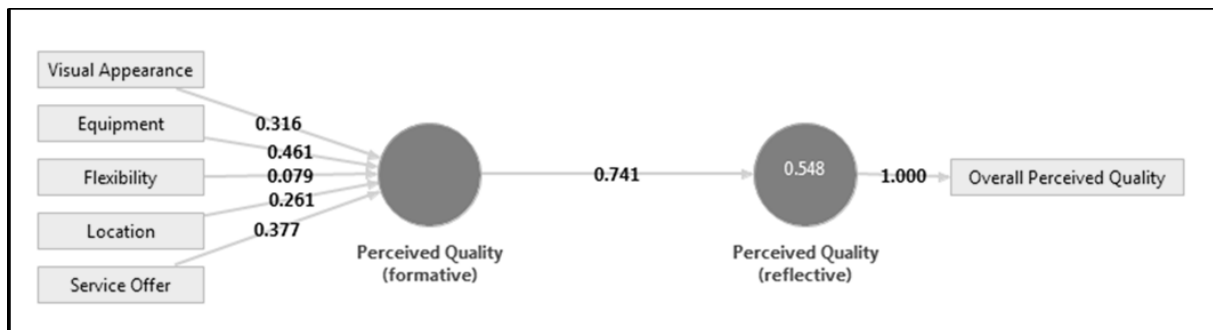
¹¹⁵² See HAIR et al. (2014), p. 129. In the case of highly correlated items, ALBERS/HILDEBRANDT (2006), p. 13 suggested forming a new index on the basis of the items. However, taking into account (1) the practical requirement for accessibility and simplicity of brand equity models emphasized in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, and (2) NITZL'S (2010), p. 31 and DIAMANTOPOULOS/RIEFLER/ROTH'S (2008), p. 1212 remarks that merging indicators may lead to severe interpretational problems related to the estimated indicator weights and the content domain, this approach is not applied in this work.

¹¹⁵³ See LOWRY/GASKIN (2014), p. 137.

change: With the exception of Equipment, all items absolutely and relatively contribute to the Perceived Quality construct. Table provides an overview of outer weights, outer loadings, and the p -values. The complete bootstrapping results including sample means, standard error, and t-statistics are summarized in Appendix 6 and Appendix 7.

Considering the results from Section Fehler! Verweisquelle konnte nicht gefunden werden. and Section Fehler! Verweisquelle konnte nicht gefunden werden. jointly, all final reflective and formative constructs exhibit satisfactory levels of quality.

Figure 33: Formative Measurement Model – Redundancy Analysis (2)



Source: Own illustration.

Table 36: Formative Measurement Model – Variance Inflation Factor (2)

Item	VIF	Assessment
Visual Appearance	1.213	Acceptable
Equipment	1.805	Acceptable
Flexibility	1.535	Acceptable
Location	1.069	Acceptable
Service Offer	1.200	Acceptable

Source: Own illustration.

Table 37: Formative Measurement Model – Outer Weights and Outer Loadings (2)

	Outer Weights	p-value	95% Confidence Interval (bias corrected)	Outer Loadings	p-value	95% Confidence Interval (bias corrected)	Assessment	
							Absolutely important	Relatively important
Visual Appearance	.522***	.000	[.356, .677]	.700***	.000	[.544, .824]	x	x
Equipment	.022	.827	[-.162, .220]	.620***	.000	[.458, .768]	x	
Flexibility	.326**	.008	[.137, .520]	.604***	.000	[.453, .745]	x	x
Location	.399***	.000	[.241, .582]	.570***	.000	[.411, .729]	x	x
Service Offer	.320***	.000	[.161, .492]	.612***	.000	[.474, .736]	x	x

* significant at $p < 0.05$ ** significant at $p < 0.01$ *** significant at $p < 0.001$

Source: Own illustration.

4.8 Assessment of the Structural Model

The assessment of the structural model was based on the estimation and bootstrapping procedure that were carried out for the evaluation of the measurement models. In an initial step, the structural model was checked for collinearity between the constructs in order to prevent biases in the calculation of the path coefficients. An examination of the corresponding VIFs showed that all values are below 3.33. Consequently, in line with the thresholds applied for the formative measurement model, the structural model does not exhibit critical levels of collinearity, and there is no need to eliminate or merge construct.¹¹⁵⁴ Table summarizes the results for all endogenous latent variables and their sets of predictor constructs.

Table 38: Structural Model – Variance Inflation Factor

Predictors	Variable Sets							
	Brand Awareness	Accessibility of Brand Associations	Valence of Brand Associations	Uniqueness of Brand Associations	Perceived Quality	Brand Trust	Brand Loyalty	Overall Brand Equity
Accessibility of Brand Associations			1.458		1.148	1.156	1.169	1.571
Brand Awareness		1.000	1.001	1.000				
Brand Familiarity	1.000	1.040	1.402	1.000				1.584
Brand Loyalty								2.515
Brand Trust							1.252	1.534
Overall Brand Equity								
Perceived Quality						1.514	1.630	1.683
Uniqueness of Brand Associations		1.041	1.086		1.082	1.097	1.103	1.117
Valence of Brand Associations					1.071	1.553	1.578	1.804

Source: Own illustration.

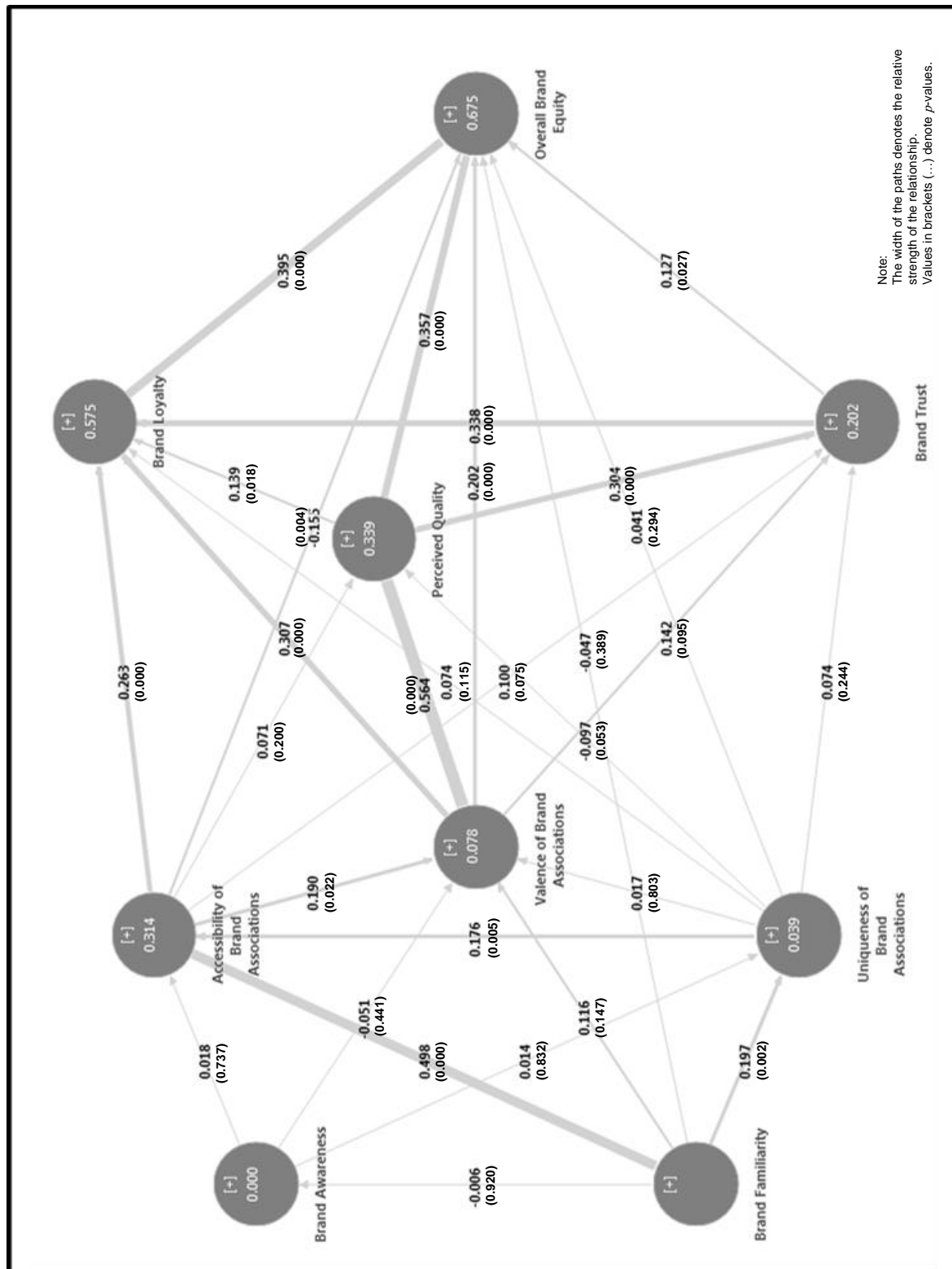
In order to test for the hypotheses underlying the brand equity model, all path coefficients were estimated and checked for significance based on the outcome of the bootstrapping procedure. Figure illustrates the results of the path coefficients and their significances within the suggested model for brand equity in a property context. Table additionally summarizes the results. A complete overview of the bootstrapping results is provided in Appendix 8.

The results demonstrate that there are comparably strong path coefficients above 0.3 between Brand Familiarity and Accessibility of Brand Associations; Valence of Brand Associations and both Perceived Quality and Brand Loyalty respectively; Perceived Quality and both Brand Trust and Overall Brand Equity respectively; Brand Trust and Brand Loyalty; and Brand Loyalty and Overall Brand Equity. Moderate path coefficients ranging from 0.2 to 0.3 were estimated between Accessibility of Brand Associations and Brand Loyalty, and Valence of Brand Associations and Overall Brand Equity. Other paths fall below 0.2 but

¹¹⁵⁴ See HAIR et al. (2014), p. 186; DIAMANTOPOULOS/SIGUAW (2006), p. 270.

are still significant regarding their p -values; for instance, between Brand Familiarity and Uniqueness of Brand Associations; Accessibility of Brand Associations and both Valence of Brand Associations and Overall Brand Equity respectively; Uniqueness of Brand Associations and Accessibility of Brand Associations; Perceived Quality and Brand Loyalty; and Brand Trust and Overall Brand Equity.

Figure 34: Structural Model – Path Coefficients, p-Values, and R²



Source: Own illustration.

Table 39: Overview – Direct Effects

	Brand Awareness	Accessibility of Brand Associations	Valence of Brand Associations	Uniqueness of Brand Associations	Perceived Quality	Brand Trust	Brand Loyalty	Overall Brand Equity
Brand Familiarity	-0.006	0.498***	0.116	0.197**				-0.047
Brand Awareness		0.018	-0.051	0.014				
Accessibility of Brand Associations			0.190*		0.071	0.100	0.263***	-0.155**
Valence of Brand Associations					0.564***	0.142	0.307***	0.202***
Uniqueness of Brand Associations		0.176**	0.017		-0.097	0.074	0.074	0.041
Perceived Quality						0.304***	0.139*	0.357***
Brand Trust							0.338***	0.127*
Brand Loyalty								0.395***
* p<0.05 ** p<0.01 *** p<0.001								

Source: Own illustration.

Several of the postulated relationships exhibit insufficient path coefficients and significances: between Brand Familiarity and Valence of Brand Associations, Overall Brand Equity, and Accessibility of Brand Associations respectively; Brand Awareness and both Valence of Brand Associations and Uniqueness of Brand Associations respectively; Accessibility of Brand Associations and both Perceived Quality and Brand Trust respectively; Valence of Brand Associations and Brand Trust; and Uniqueness of Brand Associations and Valence of Brand Associations, Perceived Quality, Brand Trust, Brand Loyalty, and Overall Brand Equity respectively. In addition, it should be noted that the significant relationship between Accessibility of Brand Associations and Overall Brand Equity is negative and contradicts its expected direction. However, even if those findings speak against the relationships that were postulated in the model, they are valuable empirical results and are considered in more detail in section **Fehler! Verweisquelle konnte nicht gefunden werden..**

Beyond the direct effects between the constructs, their indirect and total effects were calculated in order to examine the relevance of the latent variables within the brand equity framework in more detail. HAIR et al. (2014) emphasized that this step is particularly important when a study focuses on the differential impact of different antecedent constructs on a dependent construct via several mediating variables. In fact, a latent variable might exhibit a weak direct influence on a target construct while having large indirect effects that reflect a substantial overall relevance.¹¹⁵⁵ Table summarizes the indirect effects of all latent constructs in the brand equity model, and Table provides a corresponding overview of their total effects. For reasons of clarity, Table additionally provides latent variables' direct, indirect, and total effects on Overall Brand Equity in a direct comparison. The complete overview of the results from the bootstrapping procedure, including sample means,

¹¹⁵⁵ See HAIR et al. (2014), p. 174.

standard errors, *t*-statistics, and confidence intervals, is found in Appendix 9 for the indirect effects and in Appendix 10 for the total effects.

Table 40: Overview – Indirect Effects

	Brand Awareness	Accessibility of Brand Associations	Valence of Brand Associations	Uniqueness of Brand Associations	Perceived Quality	Brand Trust	Brand Loyalty	Overall Brand Equity
Brand Familiarity		0.035	0.105*	0.000	0.143**	0.143***	0.291***	0.154***
Brand Awareness		0.003	0.004		-0.026	-0.012	-0.015	-0.029
Accessibility of Brand Associations					0.107*	0.081*	0.145**	0.286***
Valence of Brand Associations						0.172***	0.185***	0.436***
Uniqueness of Brand Associations			0.034		0.041	0.008	0.082	0.035
Perceived Quality							0.103**	0.134***
Brand Trust								0.134***
* p<0.05 ** p<0.01 *** p<0.001								

Source: Own illustration.

Table 41: Overview – Total Effects

	Brand Awareness	Accessibility of Brand Associations	Valence of Brand Associations	Uniqueness of Brand Associations	Perceived Quality	Brand Trust	Brand Loyalty	Overall Brand Equity
Brand Familiarity	-0.006	0.533***	0.221**	0.197**	0.143**	0.143***	0.291***	0.107
Brand Awareness		0.020	-0.047	0.014	-0.026	-0.012	-0.015	-0.029
Accessibility of Brand Associations			0.190*		0.178*	0.181**	0.407***	0.131
Valence of Brand Associations					0.564***	0.314***	0.491***	0.638***
Uniqueness of Brand Associations		0.176**	0.051		-0.056	0.081	0.156*	0.076
Perceived Quality						0.304***	0.242***	0.492***
Brand Trust							0.338***	0.261***
Brand Loyalty								0.395***
* p<0.05 ** p<0.01 *** p<0.001								

Source: Own illustration.

Table 42: Overview – Direct, Indirect, and Total Effects on Overall Brand Equity

	Direct Effect	Indirect Effect	Total Effect
Brand Familiarity	-0.047	0.154***	0.107
Brand Awareness	-	-0.029	-0.029
Accessibility of Brand Associations	-0.155**	0.286***	0.131
Valence of Brand Associations	0.202***	0.436***	0.638***
Uniqueness of Brand Associations	0.041	0.035	0.076
Perceived Quality	0.357***	0.134***	0.492***
Brand Trust	0.127*	0.134***	0.261***
Brand Loyalty	0.395***	-	0.395***

Source: Own illustration.

In contrast to its apparent insignificant direct effect on Overall Brand Equity, Brand Familiarity exhibits a highly significant indirect effect on the target construct. In fact, Brand Familiarity shows significant positive indirect relations toward all other latent variables except for Brand Awareness and Uniqueness of Brand Associations. Similarly, its total effects on the other antecedents of Overall Brand Equity are positive and significant. However, it must be stated that its positive significant indirect effects are canceled out by its low and insignificant direct effect on the brand equity construct, leading to an insignificant total effect. For Brand Awareness, varying nonsignificant direct paths toward the other latent variables were found. Equivalently, all indirect effects were low and not significant. Altogether, its total effect on Overall Brand Equity is nonsignificant and comparably close to zero. In the case of Accessibility of Brand Associations, the indirect and direct effect on Overall Brand Equity is significant but exhibits a different sign. The latent variable has a weak to moderate negative direct relationship with the brand equity construct whereas its indirect effect is larger and positive. Considering its indirect and total effects on other antecedents of Overall Brand Equity, Accessibility of Brand Associations has a strong influence via Valence of Brand Associations, Perceived Quality, Brand Trust, and in particular Brand Loyalty. Valence of Brand Associations exhibits significant positive effects on all other descendant latent variables, including a highly significant positive direct effect on Overall Brand Equity. The construct's indirect effect on the brand equity construct via Perceived Quality, Brand Trust, and Brand Loyalty is even larger than its direct effect, resulting in the largest total effect on the final latent variable. In the case of Uniqueness of Brand Associations, no significant indirect effect on Overall Brand Equity or one of its antecedents was found. However, its weak direct and indirect effect on Brand Loyalty adds up to a significant total effect on the construct. Nonetheless, the total effect of Uniqueness of Brand Associations on Overall Brand Equity remains insignificant and weak. The direct effect of Perceived Quality on the brand equity construct clearly outweighs its indirect effect on the latent variable. However, both influences are significant and positive, adding up to a moderate to substantial total effect. In contrast, the direct effect of Brand Trust and its indirect effect via Brand Loyalty on Overall Brand Equity are similarly large and result in a moderate significant positive relation with the construct.

On a balance, examining the total effects of the latent variables demonstrated that Valence of Brand Associations, Perceived Quality, and Brand Trust are important determinants of Overall Brand Equity that possess direct and indirect relevance. Similarly, Brand

Loyalty exhibits a strong direct relevance. The other constructs were not found to have a significant total effect on the brand equity construct, and thus their overall relevance as determinants of the latent variable seems questionable. However, their individual roles should be considered: Brand Familiarity is a relevant indirect antecedent of brand equity, though its overall total effect is nonsignificant. The nature of Accessibility of Brand Associations is contradictive: on the one hand, the construct has a significant negative direct influence on the outcome variable; on the other, its indirect effect is positive and highly significant. The importance of Uniqueness of Brand Associations and Brand Awareness is doubtful as they both showed no significant total effect on Overall Brand Equity.

In the next step, the coefficient of determination R^2 and the predictive relevance Q^2 of the model were evaluated. The coefficient of determination was directly derived from the output of the PLS algorithm, and a blindfolding procedure was carried out in order to obtain values for Q^2 . Considering the sample size of 231 and the common recommendation to apply omission distances between 5 and 10, the omission distance for this study was chosen with a value of 8 in order to prevent the deletion of full rows of the data matrix.¹¹⁵⁶ An overview of the results for R^2 and Q^2 is provided in Table . In addition, the table includes values for R^2_{adj} , which refers to R^2 modified according to the number of exogenous constructs relative to the sample size. HAIR et al. (2014) stated that the adjusted coefficient of determination is commonly used for comparing PLS-SEM results from models with different numbers of exogenous variables and sample sizes.¹¹⁵⁷ Likewise, the adjusted R^2 values are provided for reasons of comparability only.¹¹⁵⁸

Table 43: Overview – R^2 , Q^2 , and adjusted R^2

	R^2	Assessment R^2	Q^2	Assessment Q^2	R^2_{adj}
Brand Awareness	0.000	-	-0.021	Not Acceptable	-0.004
Accessibility of Brand Associations	0.314	Moderate	0.270	Acceptable	0.305
Valence of Brand Associations	0.078	Weak	0.048	Acceptable	0.062
Uniqueness of Brand Associations	0.039	Weak	0.013	Acceptable	0.031
Perceived Quality	0.339	Moderate	0.117	Acceptable	0.331
Brand Trust	0.202	Weak	0.121	Acceptable	0.187
Brand Loyalty	0.575	Moderate	0.340	Acceptable	0.565
Overall Brand Equity	0.675	Moderate	0.427	Acceptable	0.665

Source: Own illustration.

Following the categorization proposed by CHIN (1998), one can state that Valence of Brand Associations, Uniqueness of Brand Associations, and Brand Trust exhibit weak coefficients of determination, indicating that only small proportions of their variance are explained by their predictors. For Accessibility of Brand Associations, Perceived Quality, and Brand Loyalty, medium levels of variance explanation were achieved.¹¹⁵⁹ In the case of Overall Brand Equity, the coefficient of determination was slightly above 0.67, suggesting

¹¹⁵⁶ See HAIR et al. (2014), p. 180; RINGLE/SPREEN (2007), p. 215.

¹¹⁵⁷ See HAIR et al. (2014), p. 176. For instance, SARSTEDT/WILCZYNSKI/MELEWAR (2013), p. 335 applied the adjusted R^2 in order to compare results across varying study settings.

¹¹⁵⁸ In this regard, it should be noted that for the case of Brand Awareness, the adjusted R^2 exhibits a negative value, which can be the result of adjustments for the number of exogenous variables and sample size.

¹¹⁵⁹ See HAIR et al. (2014), p. 175; CHIN (1998), p. 323.

a moderate to substantial proportion of explained variance. The variance in Brand Awareness was not explained at all, indicating that Brand Familiarity had no explanatory power as the only predictor of this construct. Similarly, variances in Uniqueness of Brand Associations and Valence of Brand Associations were explained only to an extremely small extent by their antecedents. In fact, this result might be partially attributable to the generally low number of predictors, with Brand Familiarity, Brand Awareness, and Uniqueness of Brand Associations being single-item constructs. Moreover, in light of this study's focus on Overall Brand Equity, the apparent weakness of the model in explaining Brand Awareness, Valence of Brand Associations, and Uniqueness of Brand Associations seems un-critical. Consequently, considering the early stage of research, it can be concluded that the suggested model includes central determinants of brand equity and has substantial power in explaining the latent variable.

This assessment is also supported by the examination of the Q^2 values. In the case of Valence of Brand Associations and Uniqueness of Brand Associations, a low predictive relevance was found, and for Brand Awareness, the criterion fell below the acceptable threshold of 0, indicating that the model did not possess predictive relevance for this construct. However, the suggested model exhibits a higher predictive relevance for Accessibility of Brand Associations, Perceived Quality, Brand Trust, and Brand Loyalty. Finally, for the study's target construct, Overall Brand Equity, a satisfactory level of the Stone-Geisser criterion was achieved. Altogether, one can conclude that the model's predictive power clearly centers on the brand equity construct, while its capability to explain the variances of its antecedents is lower.

In a final step, the effect sizes (f^2) for all exogenous constructs were calculated in order to examine to what extent a certain predictor contributes to the variance explanation of a dependent latent variable.¹¹⁶⁰ The corresponding results are provided in Table .

Table 44: Overview – Effect Sizes f^2

	Brand Awareness	Accessibility of Brand Associations	Valence of Brand Associations	Uniqueness of Brand Associations	Perceived Quality	Brand Trust	Brand Loyalty	Overall Brand Equity
Brand Familiarity	0.000	0.348	0.010	0.040				0.004
Brand Awareness		0.000	0.003	0.000				
Accessibility of Brand Associations			0.027		0.007	0.011	0.139	0.047
Valence of Brand Associations					0.450	0.016	0.140	0.070
Uniqueness of Brand Associations		0.044	0.000		0.013	0.006	0.012	0.005
Perceived Quality						0.077	0.028	0.233
Brand Trust							0.215	0.032
Brand Loyalty								0.191

Source: Own illustration.

¹¹⁶⁰ See COHEN (1988), p. 83; HENSELER/RINGLE/SINKOVICS (2009), p. 303.

The effect sizes support the results from the previous examination of the direct and total effects. Brand Familiarity has a moderate to substantial influence on Accessibility of Brand Associations and a weak influence on Uniqueness of Brand Associations. For the Brand Awareness construct, no noteworthy influences on its descendants were found. Accessibility of Brand Associations has a weak effect on Valence of Brand Associations and Overall Brand Equity and a weak to medium effect on Brand Loyalty. In the case of Valence of Brand Associations, a substantial influence on Perceived Quality was identified, a weak influence on Overall Brand Equity, and a medium influence on Brand Loyalty. Uniqueness of Brand Associations has only a weak influence on Accessibility of Brand Associations. For Perceived Quality, weak effects on Brand Trust and Brand Loyalty were detected, but it had a moderate influence on the brand equity construct. In contrast, Brand Trust has a moderate influence on Brand Loyalty and only a weak effect on Overall Brand Equity. Finally, Brand Loyalty exhibits a moderate effect on the target variable Overall Brand Equity.

Looking at the table above, one can conclude that Accessibility of Brand Associations is mainly influenced by Brand Familiarity, whereas Valence of Brand Associations is a main determinant of Perceived Quality. Similarly, variances in Brand Loyalty are primarily explained by Brand Trust, Valence of Brand Associations, and Accessibility of Brand Associations. The brand equity construct has two main determinants, Perceived Quality and Brand Loyalty, followed by Valence of Brand Associations, Accessibility of Brand Associations, and Brand Trust.

To recapitulate, the proposed model for brand equity in a property context cannot be rejected on the basis of the previous assessments of the measurement models and the structural model. Consequently, the following step of the analysis examines the hypotheses that underlie the structural model.

4.9 Final Examination of Hypotheses

The examination of the hypotheses focuses on whether the postulated relationships were confirmed in the empirical study, based on the significance and sign of the corresponding path coefficients.¹¹⁶¹ Paths that were not significant ($p > 0.05$) or that had a different sign than was postulated indicated that the corresponding hypothesis cannot be accepted.¹¹⁶² A final discussion of the findings is provided in Section **Fehler! Verweisquelle konnte nicht gefunden werden..**

Altogether, the suggested model explains a substantial proportion of the variance in the brand equity construct. In order to briefly examine the overall stability of the model, HOMBURG/KLARMANN (2006) suggest eliminating 10% of the data sample at random and re-estimating the model with substantial deviations, indicating that the causal model should

¹¹⁶¹ See WEIBER/MÜHLHAUS (2010), p. 184; HUBER et al. (2007), p. 115.

¹¹⁶² See GÖTZ/LIEHR-GOBBER (2004), p. 730.

be questioned.¹¹⁶³ Since this was not the case for the model in this study, an acceptable level of stability can be assumed.

Nonetheless, several hypotheses derived from theoretical considerations and empirical findings from previous studies were not confirmed. Table summarizes the set of hypotheses and their assessment on the basis of the significance of the estimated path coefficients. Regarding Brand Familiarity, hypothesis H_{FAM3} and H_{FAM5} were confirmed, suggesting that higher levels of Brand Familiarity are associated with an increased Accessibility of Brand Associations and Uniqueness of Brand Associations. In contrast, the latent variable was not identified as a direct antecedent of Overall Brand Equity and showed no significant influence on Brand Awareness or Valence of Brand Associations, leading to the rejection of H_{FAM1} , H_{FAM2} , and H_{FAM4} . The three hypotheses H_{AWA1} , H_{AWA2} , and H_{AWA3} , describing the expected consequences of Brand Awareness, were not confirmed.

Table 45: Overview – Hypotheses, Path Coefficients, and Significances

Hypothesis	Path	Path Coefficient	p-Value	Confirmation of Hypothesis
H_{FAM1}	Brand Familiarity → Overall Brand Equity	-0.047	0.389	No
H_{FAM2}	Brand Familiarity → Brand Awareness	-0.006	0.920	No
H_{FAM3}	Brand Familiarity → Accessibility	0.498	0.000	Yes
H_{FAM4}	Brand Familiarity → Valence	0.116	0.147	No
H_{FAM5}	Brand Familiarity → Uniqueness	0.197	0.002	Yes
H_{AWA1}	Brand Awareness → Accessibility	0.018	0.737	No
H_{AWA2}	Brand Awareness → Valence	-0.051	0.441	No
H_{AWA3}	Brand Awareness → Uniqueness	0.014	0.832	No
H_{ACC1}	Accessibility of Brand Associations → Overall Brand Equity	-0.155	0.004	No
H_{ACC2}	Accessibility of Brand Associations → Perceived Quality	0.071	0.200	No
H_{ACC3}	Accessibility of Brand Associations → Brand Trust	0.100	0.075	No
H_{ACC4}	Accessibility of Brand Associations → Brand Loyalty	0.263	0.000	Yes
H_{ACC5}	Accessibility of Brand Associations → Valence of Brand Associations	0.190	0.022	Yes
H_{VAL1}	Valence of Brand Associations → Overall Brand Equity	0.202	0.000	Yes
H_{VAL2}	Valence of Brand Associations → Perceived Quality	0.564	0.000	Yes
H_{VAL3}	Valence of Brand Associations → Brand Trust	0.142	0.095	No
H_{VAL4}	Valence of Brand Associations → Brand Loyalty	0.307	0.000	Yes
H_{UNI1}	Uniqueness of Brand Associations → Overall Brand Equity	0.041	0.294	No
H_{UNI2}	Uniqueness of Brand Associations → Perceived Quality	-0.097	0.053	No
H_{UNI3}	Uniqueness of Brand Associations → Brand Trust	0.074	0.244	No
H_{UNI4}	Uniqueness of Brand Associations → Brand Loyalty	0.074	0.115	No
H_{UNI5}	Uniqueness of Brand Associations → Accessibility of Brand Associations	0.176	0.005	Yes
H_{UNI6}	Uniqueness of Brand Associations → Valence of Brand Associations	0.017	0.803	No
H_{QAL2}	Perceived Quality → Brand Loyalty	0.139	0.018	Yes
H_{QAL1}	Perceived Quality → Overall Brand Equity	0.357	0.000	Yes
H_{QAL3}	Perceived Quality → Brand Trust	0.304	0.000	Yes
H_{LOY1}	Brand Trust → Overall Brand Equity	0.127	0.027	Yes
H_{LOY2}	Brand Trust → Brand Loyalty	0.338	0.000	Yes
H_{LOY1}	Brand Loyalty → Overall Brand Equity	0.395	0.000	Yes

Source: Own illustration.

¹¹⁶³ See HOMBURG/KLARMANN (2006), p. 737.

The latent variable did not exhibit a significant relation toward Accessibility of Brand Associations, Valence of Brand Associations, or Uniqueness of Brand Associations. In contrast to the hypothesized relation, Accessibility of Brand Associations was demonstrated to have a significant negative effect on Overall Brand Equity, leading to a rejection of H_{ACC1} . Similarly, H_{ACC2} and H_{ACC3} were not confirmed, owing to the insignificance of the paths toward Perceived Quality and Brand Trust. However, the latent variable showed significant positive relations with Brand Loyalty and Valence of Brand Associations, suggesting the acceptability of H_{ACC4} and H_{ACC5} . Significant positive relations with Overall Brand Equity, Perceived Quality, and Brand Loyalty were found for Valence of Brand Associations. Consequently, hypotheses H_{VAL1} , H_{VAL2} , and H_{VAL4} were confirmed, whereas H_{VAL3} was rejected. Regarding the role of Uniqueness of Brand Associations, only hypothesis H_{UNI5} was confirmed: the construct was found to have a significant positive relation with Accessibility of Brand Associations. However, no significant path was identified between Uniqueness of Brand Associations and Overall Brand Equity, Perceived Quality, Brand Trust, Brand Loyalty, or Valence of Brand Associations, resulting in a rejection of H_{UNI1} , H_{UNI2} , H_{UNI3} , H_{UNI4} , and H_{UNI6} . All hypotheses concerning Perceived Quality were confirmed. The empirical study showed that higher levels of Perceived Quality are associated with higher levels of Brand Loyalty, Brand Trust, and Overall Brand Equity, suggesting the acceptability of H_{QAL1} , H_{QAL2} , and H_{QAL3} . Equivalently, Brand Trust had a significant positive relation with Overall Brand Equity and Brand Loyalty, leading to the acceptance of H_{TRU1} and H_{TRU2} . Finally, the empirical investigation suggests that higher levels of Brand Loyalty are associated with higher levels of Overall Brand Equity. Thus, hypothesis H_{LOY1} was confirmed.

4.10 Importance-Performance Matrix Analysis

In order to derive more meaningful recommendations from a causal analysis and illustrate the diagnostic value of a model, HAIR et al. (2014) recommended extending the analysis in an Importance-Performance Matrix Analysis. The analysis builds upon the results of the basic PLS-SEM outcomes and contrasts the structural model total effects (importance) and the mean values of the latent variable or indicator scores (performance), of which the latter are rescaled on a scale of 0 to 100 in order to facilitate interpretation. In this way, significant areas for the improvement of the target construct can be highlighted. Particularly, the method allows for identifying predictor variables with a relatively high importance and relatively low performance that represent major areas of improvement on which management activities can focus.¹¹⁶⁴ In this regard, the Importance-Performance Matrix Analysis has, for instance, already proved useful in a study by VÖLCKNER et al. (2010), who examined the role of parent brand quality for service brand extensions. In this context, the method was applied to develop a priority map denoting on which aspects marketing managers should focus to increase the likelihood of a successful brand extension.¹¹⁶⁵ MARTENSEN/GRONHOLDT (2003) also used an Importance-Performance Matrix Analysis to emphasize areas for improvement in building library users' satisfaction and loyalty.¹¹⁶⁶ Similar

¹¹⁶⁴ See HAIR et al. (2014), p. 206.

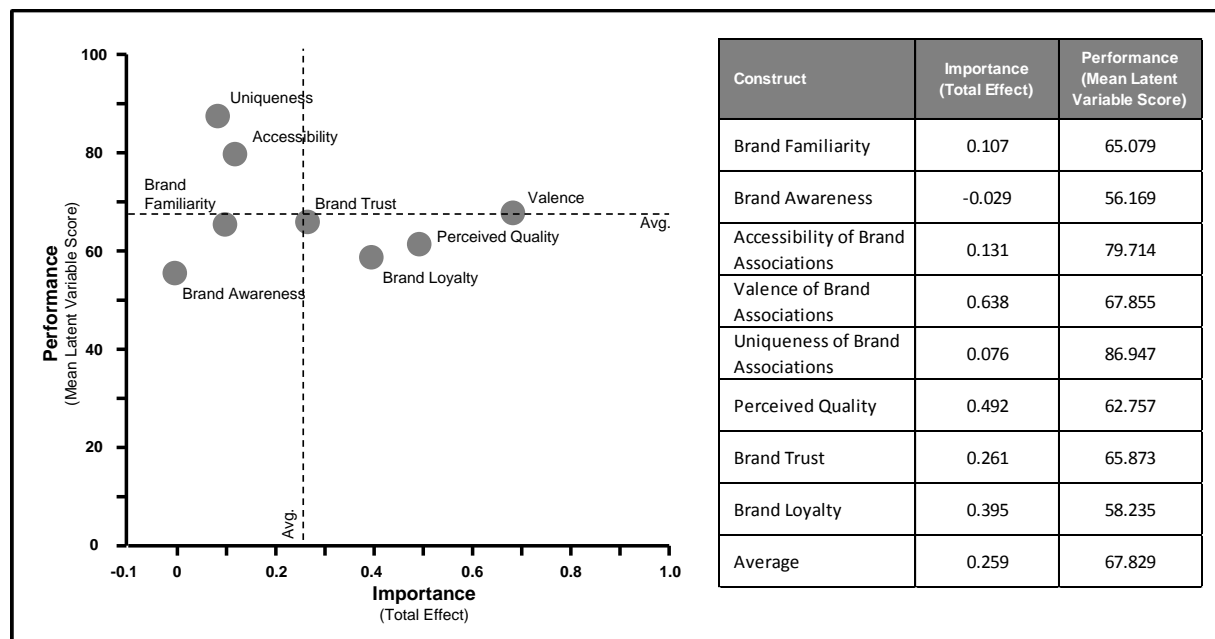
¹¹⁶⁵ See VÖLCKNER et al. (2010), pp. 389-391.

¹¹⁶⁶ See MARTENSEN/GRONHOLDT (2003), p. 144.

procedures were also applied in earlier studies in order to highlight drivers of customer loyalty and satisfaction in the context of the American Customer Satisfaction Index (FORNELL et al. (1996)) and the European Customer Satisfaction Index (MARTENSEN/GRØNHOLDT/KRISTENSEN (2000)).¹¹⁶⁷

Following the procedure proposed by HAIR et al. (2014) and VÖLCKNER et al. (2010), the Importance-Performance Matrix Analysis was carried out for the suggested brand equity model. All mean latent variable and mean indicator scores were rescaled to obtain performance index values and contrasted with their respective standardized total effects on the Overall Brand Equity construct. Following MARTENSEN/GRØNHOLDT (2003), the resulting priority maps were divided into four cells based on the average total effects and performance scores, which can be interpreted in managerially useful ways: The upper-left cell denotes variables where performance is strong but the impact is low. Consequently, the authors suggested that the status should be maintained or resources even transferred to other areas. The upper-right cell comprises cases where both performance and impact are strong, thus suggesting that the current status be retained. The lower-left cell describes areas where both dimensions exhibit a low score. Consequently, the corresponding variables do not require substantial levels of attention even if their performance scores are under average. Finally, the lower-right cell is characterized by high levels of importance and a low performance, thus representing the area of the greatest opportunities, on which efforts should be focused.¹¹⁶⁸ Figure illustrates the results on latent variable level, whereas the findings for the indicator level are displayed in Figure on page 265.

Figure 35: Importance-Performance Matrix Analysis (Construct Level)



Source: Own illustration.

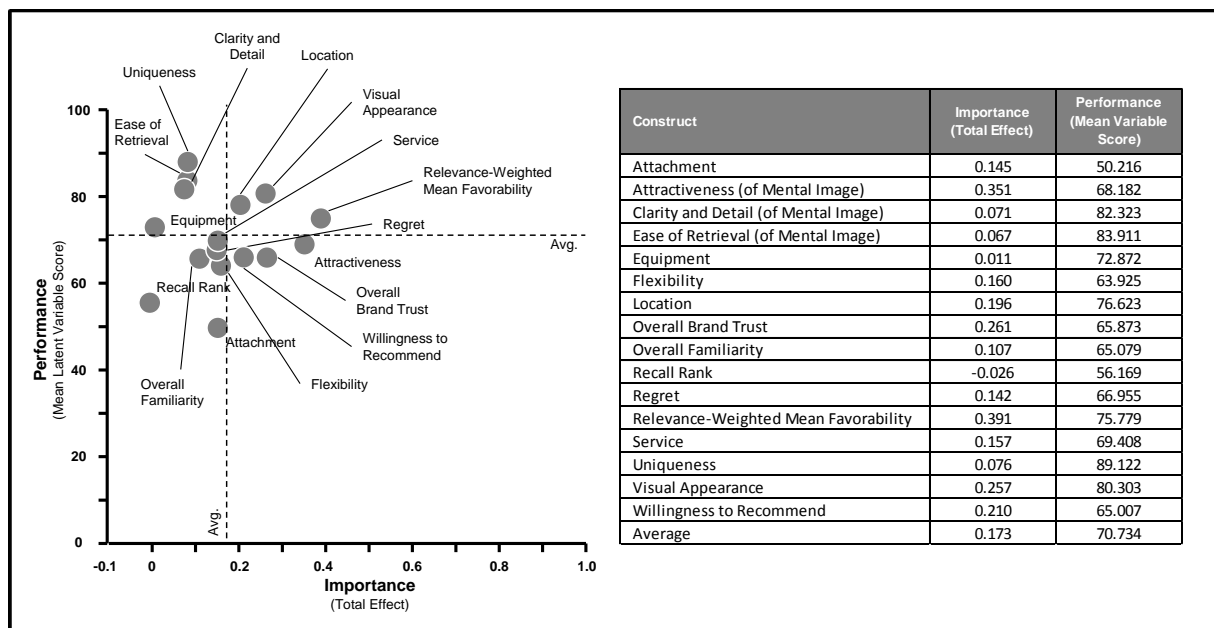
In accordance with the findings from Section **Fehler! Verweisquelle konnte nicht gefunden werden.** regarding the total effects, Valence of Brand Associations, Perceived

¹¹⁶⁷ See MARTENSEN/GRØNHOLDT/KRISTENSEN (2000), pp. 546-547; FORNELL et al. (1996), p. 11.

¹¹⁶⁸ See MARTENSEN/GRØNHOLDT (2003), pp. 143-144.

Quality, Brand Loyalty, and Brand Trust are main drivers of Overall Brand Equity. However, across the sample of office property brands, the latent variables scores indicate that there is room for improvement: On average, the examined property brands achieve a performance score of 67.855 in Valence of Brand Associations, 65.873 in Brand Trust, 62.757 in Perceived Quality, and only 58.235 in Brand Loyalty. The highest scores are realized in Uniqueness of Brand Associations and Accessibility of Brand Associations, which were both found to exhibit only minor insignificant total effects on the brand equity construct. In the case of Accessibility of Brand Associations, it should be noted, however, that the insignificance of the total effect is a result of a negative significant direct effect and a positive significant indirect effect, which offset each other. Brand Familiarity also has only limited importance in explaining Overall Brand Equity and shows an average performance score of 65.079. However, it should be stated that the latent variable proved to have a significant indirect effect on Overall Brand Equity and significant total effects on all other antecedents of the construct except for Brand Awareness. In contrast, Brand Awareness showed no significant total effect and also had the lowest performance score. Altogether, the sample of office property brands achieved higher scores in variables that were identified as having only minor influences on the brand equity construct, whereas important drivers such as Valence of Brand Associations, Perceived Quality, and Brand Loyalty demonstrate potential for improvements.

Figure 36: Importance-Performance Matrix Analysis (Indicator Level)



Source: Own illustration.

Regarding the multi-item constructs included in the model, the Importance-Performance Matrix Analysis on indicator level may provide a basis to derive more specific insights on potentials to enhance the Overall Brand Equity score of the office property brands. Regarding the Valence of Brand Associations, the Relevance-Weighted Mean Favorability of brand associations and the Attractiveness of the mental image exhibit the highest total effects on brand equity, though both have some potential for improvement. The importance

and performance of the Perceived Quality items are distinct: Visual Appearance and Location both have comparably high levels of importance and achieve performance scores of 80.303 and 76.623. On the other hand, Service and Flexibility demonstrate lower performance levels and corresponding lower performance scores of 69.408 and 63.925. Equipment also achieved a comparably high average score of 72.872 but is of lesser importance for the brand equity construct. Looking at the Brand Loyalty construct, Attachment and Regret have similar total effects but exhibit clear differences in their performance scores: Attachment achieves a score of only 50.216, while Regret reaches a level of 66.955. Willingness to Recommend clearly dominates the other two indicators in terms of importance but also leaves room for improvement. The Ease of Retrieval of the mental image and its Clarity and Detail both play only a minor role in creating brand equity; however, their performance levels are 83.911 and 82.323, which are the second and third highest scores.

To recapitulate, the Importance-Performance Matrix Analysis emphasized that the office property brands from the sample exhibit main areas for improvement. In particular, their performance in the main drivers of brand equity, such as Valence of Brand Associations, Brand Loyalty, Perceived Quality, and Brand Trust is only slightly above average or even below, whereas their strengths center on areas such as Accessibility of Brand Associations and Uniqueness of Brand Associations, which were found to have only minor effects on the outcome variable.

4.11 Summary, Discussion, and Limitations

In the following, the study procedure is briefly summarized and the main findings regarding the measurement models and the structural model are critically discussed. Finally, conclusions for real estate research and practice are drawn, and relevant limitations of the study are highlighted.

4.11.1 Summary and Discussion of the Main Findings

The objective of this study was to gain an understanding of how brand equity is built in an office property context and to derive initial recommendations for real estate practitioners on how to establish and manage office property brands. Specifically, the study was aimed at developing and empirically testing a brand equity model for office property brands while accounting for the academic and practical requirements described in Section **Fehler! Verweisquelle konnte nicht gefunden werden..**

For this purpose, a set of potentially relevant components of property brand equity was derived from literature and integrated in a basic conceptual framework. Building upon a hierarchy-of-effects model, a general causal sequence of the brand equity components was suggested, and the initial conceptual model was briefly discussed in light of office leasing processes. Afterward, PLS-SEM was introduced as an appropriate method to em-

pirically test the model. In the next step, the dimensionality of the brand equity components was further discussed, and measurement approaches were adapted from literature. Following the hierarchy of effects, a set of hypotheses was developed from theoretical considerations and empirical findings from the body of literature and integrated in the basic conceptual framework. The data collection procedure and the data sample were briefly described before the model was estimated with the help of the SmartPLS 3.0 software. Applying the quality criteria outlined in the methodological section, the measurement models were assessed and partially adapted, and the structural model was evaluated. Against this background, the set of hypotheses underlying the structural model was examined, and an Importance-Performance Matrix Analysis was conducted in order to illustrate potential managerial implications of the model.

Regarding the suggested measurements, reflective and formative constructs generally met the relevant quality criteria at a satisfactory level. However, the formative measurement model for Perceived Quality suffered from a suppressor effect between Flexibility and Functionality, indicating that there might be a conceptual overlap between the two quality facets that causes substantial levels of collinearity. Consequently, Functionality was eliminated from the item set for reasons of interpretability and collinearity, which can be seen critically regarding the content validity of the construct. Even if some authors such as POMMERANZ (2008) do not differentiate between the two quality facets, this finding stands against the categorization of building characteristics that is applied in several real estate publications.¹¹⁶⁹ Following a suggestion by CENFETELLI/BASSELIER (2009), future studies in this field should examine whether the two items consistently behave in the same manner. If this is the case, the authors proposed, a general combination of the two aspects should be considered.¹¹⁷⁰

The assessment of the proposed structural model and the corresponding examination of the hypotheses resulted in several valuable findings regarding the role and nature of the suggested property brand equity components, which should be discussed and briefly compared to the findings of earlier studies in the following.

The assumption that Brand Familiarity is a direct antecedent of brand equity in an office property context was not supported, which clearly stands in contrast to studies from other fields of research, such as MACKAY (2001) and HUTTON (1997), and also contradicts the notion of a mere exposure or habituation effect.¹¹⁷¹ Obviously, the extent of brand-related experiences alone does not drive an office property's brand equity in the sense of a decision heuristic, which might be attributable to the specifics of leasing processes as high-involvement organizational decisions. FAIRCLOTH (2005) came to a similar result in a non-profit setting, where higher levels of familiarity with an organization had a negative impact on the willingness to provide resources to an organization.¹¹⁷² However, even if no significant total effect on brand equity was found, respondents' familiarity with a property brand plays a certain role as an indirect antecedent of the construct via its direct and indirect ef-

¹¹⁶⁹ See POMMERANZ (2008), p. 52. For categorizations that differentiate between the two quality facets, see, for instance, ERTLE-STRAUB (2002), p. 81; ABEL (1994), p. 28.

¹¹⁷⁰ See CENFETELLI/BASSELIER (2009), pp. 696-697.

¹¹⁷¹ See PINA/IVERSEN/MARTÍNEZ (2010), p. 946; MACKAY (2001), p. 47; HUTTON (1997), pp. 433-434; ZIMBARDO/LEIPPE (1991), p. 171.

¹¹⁷² See FAIRCLOTH (2005), p. 9.

fects on other components. In line with the work of CAMPBELL/KELLER (2003), KENT/ALLEN (1994), ALBA/HUTCHINSON/LYNCH (1991), and KELLER (1987), higher levels of familiarity were found to be associated with an increased accessibility of brand-related associations, implying that knowledge on familiar property brands is more stable, processed more easily, and less prone to interferences with competing brands.¹¹⁷³ A positive effect of brand familiarity on the favorability of brand associations was not confirmed, which contrasts the findings of earlier studies such as DELGADO-BALLESTER/NAVARRO/SICILIA (2012), BOGOMOLOVA/ROMANIUK (2010), and PARK (2009). Consequently, it can be assumed that respondents do not necessarily hold beneficial associations toward a property brand only on the basis of extensive brand-related experiences. In fact, a property brand might be very familiar but the brand-related associations highly unfavorable. In this regard, the stability and improved accessibility of brand associations might be unfortunate for familiar brands.¹¹⁷⁴ A positive direct effect was also confirmed toward the Uniqueness of Brand Associations, which is directly in line with the work of OAKENFULL/MCCARTHY (2012), implying that the proportion of brand-specific associations increases with higher levels of familiarity with a property brand.¹¹⁷⁵ In contrast to several publications from other fields of research, the empirical study did not identify a significant relation between Brand Familiarity and Brand Awareness, implying that the sequence of recalled brands was independent from respondents' familiarity with the brands.¹¹⁷⁶

Brand Awareness was found to exhibit no significant direct or indirect effects on any of the other constructs. While it has already been argued in Section **Fehler! Verweisquelle konnte nicht gefunden werden.** that, presumably, there is no direct relation between respondents' ability to recall a brand and Overall Brand Equity, this result was surprising. The hypothesized effects on brand associations' accessibility, valence, and uniqueness in particular were not confirmed, which is in contrast to the findings of several publications across different study settings.¹¹⁷⁷ However, the result is supported by BIEDENBACH/MARELL's (2010) examination of high-involvement purchases (auditing services) in a business-to-business context, which also did not discover a respective effect of respondents' brand awareness.¹¹⁷⁸ The results of this study are also in accordance with BIEDENBACH/BENGTSSON/WINCENT's (2011) argument that in the case of high levels of brand awareness, the development of brand equity might be better captured through other components.¹¹⁷⁹ Thus, while individuals' awareness of a property brand in the sense of a certain memory node is still a necessary precondition to establish brand-related knowledge,¹¹⁸⁰ it might be generally questionable whether brand recall is of particular rele-

¹¹⁷³ See CAMPBELL/KELLER (2003), p. 293; KENT/ALLEN (1994), pp. 97-98; ALBA/HUTCHINSON/LYNCH (1991), p. 10; KELLER (1987), p. 329.

¹¹⁷⁴ See CARRILAC/LAFFERTY/HARRIS (2005), p. 53.

¹¹⁷⁵ See OAKENFULL/MCCARTHY (2012), p. 285.

¹¹⁷⁶ See, for instance, DELGADO-BALLESTER/NAVARRO/SICILIA's (2012), pp. 1264-1266; MIKHAILITCHENKO et al. (2009), p. 936; CAMPBELL/KELLER (2003), pp. 301-302; KENT/KELLARIS (2001), pp. 165-166.

¹¹⁷⁷ See, for instance, BUIL/DE CHERNATONY/MARTÍNEZ (2013), p. 120; JUNTUNEN/JUNTUNEN/JUGA (2011), p. 307; SCHUILING/KAPFERER (2004), p. 105.

¹¹⁷⁸ See BIEDENBACH/MARELL (2010), p. 453.

¹¹⁷⁹ See BIEDENBACH/BENGTSSON/WINCENT (2011), p. 1094.

¹¹⁸⁰ See BUIL/MARTINEZ/DE CHERNATONY (2013), p. 63; TONG/HAWLEY (2009), pp. 267-269; KELLER (1993), p. 3.

vance in the context of leasing processes, where company representatives accumulate an extensive level of knowledge on different property brands that are available in the market instead of relying on an initial consideration set. With respect to the particularities of office properties and real estate markets, this consideration is also in line with HOMBURG/KLARMANN/SCHMITT's (2010) conclusion that brand awareness is of limited importance in markets that are characterized by product heterogeneity, low levels of technological turbulence, low levels of time pressure, and high levels of buying-center heterogeneity.¹¹⁸¹

The empirical results of the study suggest that Accessibility of Brand Associations has a significant negative effect on Overall Brand Equity, which contradicts the hypothesized positive relationship and corresponding previous studies such as GEUS (2005) and KIM/HYUN (2011).¹¹⁸² On the other hand, a significant positive indirect effect on the brand equity construct via Valence of Brand Associations, Perceived Quality, Brand Loyalty, and Brand Trust was identified, which corresponds to the results of earlier publications such as AMINI et al. (2012), who included aspects of associations' accessibility in their operationalization of the brand associations construct.¹¹⁸³ The positive direct effect on the favorability of brand associations also supports the notion that an increased processing fluency theory might increase individuals' evaluations, since individuals associate the pleasant experience of facilitated processing with the overall favorability of the property brand.¹¹⁸⁴ In line with the arguments of MING/ISMAIL/RASIAH (2011), TAM/WOOD/JI (2009), and ELLIOTT/YANNAPOULOU (2007), one can conclude that it is not enough that associations are easily retrieved from memory; they also should be related to a positive attitude toward the brand, reflected in their favorability, corresponding quality perceptions, and feelings of trust and loyalty.¹¹⁸⁵ Nonetheless, on balance, Accessibility of Brand Associations had an insignificant total effect on the brand equity construct. Thus, its overall importance in building brand equity for a property brand seems limited compared to other brand equity components.

Property brands' uniqueness in terms of the share of brand-specific associations showed no significant direct or indirect influence on Overall Brand Equity, resulting in an overall insignificant total effect. Consequently, the results stand against the findings from previous studies such as NETEMEYER et al. (2004) and GEUS (2005).¹¹⁸⁶ However, it should be noted that those studies focused on a price premium as the primary measure of brand equity. In fact, a significant positive effect of Uniqueness of Brand Associations on Accessibility of Brand Associations and Brand Loyalty was detected, indicating that unique brand associations contribute to the retrieval of brand-related associations from memory and may drive loyal attitudes due to a higher level of differentiation that can reduce a person's openness to other property brands. This is also in line with arguments from earlier publications such as ROMANIUK/GAILLARD (2007), MEYERS-LEVY (1989), and GREENWALD/LEAVITT (1984),

¹¹⁸¹ See HOMBURG/KLARMANN/SCHMITT (2010), p. 208.

¹¹⁸² See KIM/HYUN (2011), p. 434; GEUS (2005), pp. 147-149.

¹¹⁸³ See AMINI et al. (2012), p. 200.

¹¹⁸⁴ See KRUGLANSKI/STROEBE (2014), p. 342; CHO/SCHWARZ (2006), p. 319.

¹¹⁸⁵ See MING/ISMAIL/RASIAH (2011), p. 72; TAM/WOOD/JI (2009), pp. 48-53; ELLIOTT/YANNAPOULOU (2007), pp. 990-991.

¹¹⁸⁶ See GEUS (2005), pp. 147-149; NETEMEYER et al. (2004), pp. 221-222.

who stated that the uniqueness of memorized associations is one of the main determinants of the linkage strength between memory nodes and thus is an important factor influencing their accessibility.¹¹⁸⁷ In the same regard, the empirical study identified a significant positive total effect on brand associations' valence via Accessibility of Brand Associations, which supports CHANG's (2004) argument that the uniqueness of associations drives their perceived diagnosticity, which may result in improved brand evaluations.¹¹⁸⁸

Valence of Brand Associations was identified as the brand equity component with the highest total effect on the brand equity of property brands. In particular, the construct exhibits a strong indirect effect on Overall Brand Equity via its total effects on Perceived Quality, Brand Trust, and Brand Loyalty. Consequently, favorable associations toward a property brand seem to be a main determinant of a property brand's differential effect, which is also supported by a majority of earlier studies.¹¹⁸⁹ In comparison to the total effects of brand associations' accessibility and uniqueness, one can conclude that the favorability of brand associations clearly dominates the other two aspects. It should be noted, however, that Valence of Brand Associations did not have a significant direct but an indirect positive effect on individuals' trust in the people behind a property brand via Perceived Quality. This implies that favorable associations toward a brand might not necessarily translate into higher levels of trust in the people behind the property. Rather, individuals' feeling of trust is influenced by the favorability of their brand associations via their quality perceptions. This notion is also supported by ESCH et al. (2006), who included quality perceptions in their measurement model for the brand image construct and found a positive relation with brand trust.¹¹⁹⁰

The empirical study identified Perceived Quality as a major driver of a property brand's brand equity with a significant positive direct and indirect effect on the construct. This finding has broad support from numerous studies in business-to-business settings, such as BIEDENBACH/BENGTTSSON/WINCENT (2011), KIM/HYUN (2011), VAN RIEL/DE MORTANGES/STREUKENS (2005), and BALDAUF/CRAVENS/BINDER (2003).¹¹⁹¹ In particular, BENDIXEN/BUKASA/ABRATT (2004) also emphasized perceived quality as a major brand equity driver in a study on organizational buying decisions.¹¹⁹² Following the authors' considerations, it can be concluded that in an office property context, the development of attitudinal loyalty and, ultimately, a positively biased response toward a property brand strongly depends on individuals' notion that an office property has superior abilities in fulfilling their needs compared to other properties.

Brand Trust was also found to have a significant positive direct impact on Overall Brand Equity and an indirect effect via Brand Loyalty. The direct effect on the brand equity of property brands is in line with earlier studies that highlighted the importance of brand trust

¹¹⁸⁷ See ROMANIUK/GAILLARD (2007), p. 268; MEYERS-LEVY (1989), pp. 203-206; GREENWALD/LEAVITT (1984), pp. 582-583.

¹¹⁸⁸ See CHANG (2004), pp. 700-701.

¹¹⁸⁹ See, for instance, BUIL/MARTÍNEZ/DE CHERNATONY (2013), p. 68; TONG/HAWLEY (2009), pp. 267-268.

¹¹⁹⁰ See ESCH et al. (2006), p. 100-102.

¹¹⁹¹ See BIEDENBACH/BENGTTSSON/WINCENT (2011), p. 1098; KIM/HYUN (2011), p. 433; VAN RIEL/DEMORTANGES/STREUKENS (2005), p. 845; BALDAUF/CRAVENS/BINDER (2003), p. 232.

¹¹⁹² See BENDIXEN/BUKASA/ABRATT (2004), p. 378.

in business-to-business settings, such as DONEY/BARRY/ABRATT (2007), RAUYRUEN/MILLER/GROTH (2007), and SICHTMANN (2007).¹¹⁹³ In particular, the study findings match the results of ROBERTS/MERRILEES's (2007) study in a shopping center services setting and the conclusions of DELGADO-BALLESTER/MUNUERA-ALEMÁN (2005), who also found proof for an indirect influence on brand equity via brand loyalty.¹¹⁹⁴ Altogether, tenants' trust in the people behind a property was identified as one of the four main determinants of brand equity in an office property context, which clearly emphasizes the relevance of the tenant-owner relationship in building property brand equity.

Finally, Brand Loyalty in terms of an intrinsic bond was highlighted as a major brand equity component and direct antecedent of Overall Brand Equity. In this regard, the empirical findings are in line with the work of LOBSCHAT et al. (2013) and KIM/HYUN (2011), who also focused on brand loyalty as an emotional connection toward a brand and detected a positive relation toward brand equity and its outcomes.¹¹⁹⁵ In accordance with the arguments of those authors, one can conclude that establishing a feeling of attachment and belonging is a relevant factor in building brand equity for property brands.

Altogether, the suggested model was only partially confirmed, and several hypotheses were rejected even if there was solid theoretical and empirical support from earlier publications. In particular, the role of brand awareness measured by brand recall deviated from the expectations. Nonetheless, the model achieved a substantial level of variance explanation (R^2 : 0.675) and proved predictive relevance (Q^2 : 0.427) for brand equity. A comparison of those quality criteria with previous studies seems difficult since there are no directly comparable studies covering brand equity in a property context, and many publications do not provide values for R^2 . However, studies that focus on brand equity in business-to-business settings, such as CHEN/SU (2012), CHEN/SU/LIN (2011), or JENSEN/KLASTRUP (2008), achieve levels of R^2 between approximately 0.55 and 0.80.¹¹⁹⁶ Thus, the explanatory power of the tested model is within a common range. Nonetheless, it should be noted that those studies vary in their industry setting, the number of hypothesized relationships, and the amount and nature of their suggested constructs.

Due to the fact that several hypothesized relationships were not confirmed in the model, it seems advisable to test a revised model on the basis of a new data set.¹¹⁹⁷ Re-estimating a modified version of the model in this work on the basis of the same data set, however, would result in an exploratory refitting of the model and would limit the confirmatory character of the study.¹¹⁹⁸ In this respect, FUCHS (2011) has argued that for the development of the theoretical body of knowledge, a falsification of hypotheses is often more valuable than the elimination of parameters.¹¹⁹⁹

¹¹⁹³ See DONEY/BARRY/ABRATT (2007), p. 1108; RAUYRUEN/MILLER/GROTH (2007), p. 182; SICHTMANN (2007), p. 1008.

¹¹⁹⁴ See ROBERTS/MERRILEES (2007), p. 414; DELGADO-BALLESTER/MUNUERA-ALEMÁN (2005), pp. 191-193.

¹¹⁹⁵ See LOBSCHAT et al. (2013), p. 143; KIM/HYUN (2011), p. 433.

¹¹⁹⁶ See CHEN/SU (2012), p. 62; CHEN/SU/LIN (2011), p. 1237; JENSEN/KLASTRUP (2008), p. 126.

¹¹⁹⁷ See WEIBER/MÜHLHAUS (2010), p. 190.

¹¹⁹⁸ See FUCHS (2011), p. 12.

¹¹⁹⁹ See FUCHS (2011), p. 12 referring to MEYER (1996), pp. 286-288.

The Importance-Performance-Matrix-Analysis, which was conducted in order to emphasize the managerial implications of the model, provides an appropriate means to assess the average performance of the property brand sample and draw attention to areas of potential improvement. From the results of the analysis, it can be concluded that the analyzed brands have their strengths mainly in areas identified as being of limited importance for building brand equity in a property context, such as the accessibility and uniqueness of brand associations. Consequently, it seems questionable whether marketers should concentrate resources on those areas. Instead, it seems advisable for them to focus their efforts on components that suffer from average or under average performance levels but promise to have stronger effects on a brand's overall brand equity. In this regard, four main areas were identified that might call for marketers' attention: (1) Property brands' performance concerning associations' favorability is only slightly above average but is the most important driver of property brand equity. Consequently, the component should be in the center of brand managers' attention in order to retain and even enhance the existing performance. (2) Property brands' perceived quality also showed a below-average performance, which can be primarily attributed to weaknesses in perceptions of properties' flexibility and the quality of property-related service offers. In fact, since both aspects have below-average importance for building brand equity, focusing on enhancing existing strengths might be more appropriate. In this respect, the perceived quality of property brands' location and visual appearance were found to have an above-average performance and importance, thus representing areas of relevant strengths. It should be noted, however, that the possibilities to influence a property's location and its visual appearance are highly limited. (3) Property brands exhibit low levels of brand loyalty, indicating that respondents' intrinsic bond with the brands is limited. In this regard, the lack of attachment toward the brands proved to be a major weakness. (4) Respondents' trust in the people behind the property brands is slightly below average, hinting at potential weaknesses in the relationship between (potential) tenants and owners. However, the brand equity component stands behind the other three main drivers in terms of importance, thus suggesting a lower priority from a marketer's perspective.¹²⁰⁰

In light of LAVIDGE/STEINER's (1961) hierarchy of effects, applied as a basic framework for the suggested model in this study, the findings may guide marketers' attention regarding the sequence of communication steps. In this regard, the focus of the identified brand equity drivers lies roughly at the transition between knowledge, liking, and preference building, followed by the conviction stage. The initial awareness stage, however, seems to be of lesser importance from a brand manager's point of view, since office property markets are characterized by a high level of product heterogeneity, and company representatives may engage in extensive market research and become familiar with a range of available

¹²⁰⁰ It should be noted that recommendations regarding operational approaches to enhance the different brand equity components are not within the scope of this work. For an overview of potential concepts and marketing activities for properties see, for instance, the work of ERTLE-STRAUB (2011), BRADE et al. (2008), ENGELHART (2008), BRADE (2001), KIPPES (2001). For an overview of relationship marketing activities in a real estate context see, for example, MUSSLER (2001). For case studies on communication activities for office properties see, for instance, BOMMARDT/KRAUSE (2001), DIETERLE-WEDEWARDT/KLÖPPELT (2001), and SCHÄFER (2001).

properties.¹²⁰¹ By contrast, efforts to build brand equity should center on establishing favorable brand associations through direct and indirect experiences that may translate into a positive attitude toward the brand and high levels of perceived quality. From there, marketers might focus on building a valued relationship and establishing growing levels of trust in the people behind the brand, which might finally lead to a positive leasing decision.

It seems also valuable to reflect on the findings of the study against the background of GERSTNER's (2008) office leasing process model.¹²⁰² From this perspective, the focus of activities to build brand equity for a property should concentrate on interested parties' evaluation of exposés and their site visits, since those process steps offer the possibility to create pleasant direct and indirect brand experiences that are the basis for favorable brand associations. Moreover, it seems recommendable in this stage to emphasize quality-related aspects of a building in order to enhance quality perceptions. In the next step of the leasing process, which focuses on initial negotiations with different property owners, brand managers should use the possibilities of personal contact to establish a trusted relationship with the potential tenant and foster an intrinsic bond with the brand that can be the foundation of a long-term tenant-owner relationship.

Finally, the suggested model should be briefly evaluated in light of the practical and academic requirements proposed in Section **Fehler! Verweisquelle konnte nicht gefunden werden..** Regarding academic requirements, the brand equity concept for property brands and all respective constructs, measurements, and hypotheses were based on a review of existing literature covering English and German contributions from business-to-business and business-to-customer settings. Additionally, the limited body of knowledge on property brands and office leasing processes was taken into account. Looking at the precision of terminology, all components of the model were described and different definitions discussed before an appropriate understanding of the constructs was chosen for the purpose of this study. In order to meet the requirement for a statement on potential limitations, relevant restrictions and drawbacks concerning the study sample, measurement models, and the structural model are discussed in the following section. Regarding the study documentation, it can be stated that all steps taken in the course of the conceptualization of the property brand equity construct and its empirical test were provided so that third parties may replicate all stages of the study. In order to provide an empirical validation, the suggested model was tested in the present study. At this point, it must be stated that the model was only partially confirmed and should be examined again in a revised form based on the study findings. From a practical perspective, the model's comprehensibility and accessibility is clearly supported by the hierarchy of effects that was chosen as a general framework. Similarly, the model benefits from the fact that it is roughly aligned with the stages of office leasing processes. Nonetheless, several components of brand equity, such as Brand Awareness and Accessibility of Brand Associations, might be difficult to dif-

¹²⁰¹ See HOMBURG/KLARMANN/SCHMITT (2010), p. 208. This notion is also in line with the findings of BIEDENBACH/MARELL (2010), p. 453 who also did not confirm a direct positive relationship between brand awareness and brand associations. Similarly, KIM/HYUN (2011), p. 433 did not find evidence for a hypothesized positive relationship between a combined brand awareness/brand associations construct and perceived quality and brand loyalty. However, the authors confirmed this construct as a direct antecedent of overall brand equity.

¹²⁰² See GERSTNER (2008), p. 268.

ferentiate from a practitioner's point of view. Moreover, the complexity and high number of relations between the different brand equity components might be an obstacle. Regarding cost and time effectiveness, the model relies on a comparably low number of indicators, which can be compiled and processed within a reasonable time frame. By contrast, the telephone interview approach proved to be time consuming due to numerous rearrangements and disturbances. Finally, the suggested model relied on brand equity components that had proven to be of behavioral and economic relevance in earlier studies also supported by the underlying hierarchy of effects. Nevertheless, it should be noted that the measurement of the brand equity construct did not contain a strictly behavioral component but centered on perceptions of value, prestige, enthusiasm, and a general preference for the brand. Consequently, the theoretical background strongly suggests an influence of the brand equity components on tenants' behavior and a property's economic success, but explicit empirical evidence was not provided, which is partially attributable to the limited availability of key economic data on a property level. On balance, it can be stated that the suggested model fulfills the academic requirements on a satisfactory level. However, the model obviously has some weaknesses regarding its accessibility from a practitioner's perspective and lacks a final empirical validation of its economic relevance.

4.11.2 Limitations of the Study

Apart from the limitations of the PLS-SEM methodology that were briefly outlined in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, the study has several restrictions and drawbacks concerning mainly the generalizability of the study results, unobserved heterogeneity, the suggested measurement models, and the structural model.

The validity of all inferences based on the study findings is clearly limited by the selected sample. For one thing, due to property owners' concerns regarding confidentiality, the data collection compulsorily relied on real estate agents as surrogates for company representatives engaged in a leasing decision. Although it was argued in Section **Fehler! Verweisquelle konnte nicht gefunden werden.** that this group is an appropriate approximation, it cannot be ruled out that real estate agents' perception of property brands deviates from the actual perception of office tenants, thus limiting the external validity of the study results.¹²⁰³ Moreover, the study focuses on a specific point in time and does not provide a longitudinal examination of respondents' brand perceptions. Thus, the study may not draw conclusions on the effect stability of the suggested brand equity components.¹²⁰⁴

Regarding unobserved heterogeneity, it should be noted that apart from a differentiation between male and female respondents, the study assumed a homogenous population. In fact, there might be groups of respondents that significantly differ in their perception of property brands and the way brand equity is built in their minds.¹²⁰⁵ For instance, company representatives might be distinguishable based on demographics, psychographics, or particularities of their company.¹²⁰⁶ However, in light of real estate professionals' restricted time budget and the common hesitance to provide company details, those aspects were

¹²⁰³ See RIOS/RIQUELME (2008), p. 728; WELLS (1993), pp. 491-492; SEARS (1986), pp. 515-530.

¹²⁰⁴ See NASKRENT (2010), p. 355.

¹²⁰⁵ See HAIR et al. (2014), p. 243; SARSTEDT et al. (2011), p. 35; SARSTEDT (2008), pp. 228-229.

¹²⁰⁶ See HAHN et al. (2002), pp. 243-244.

neglected in the questionnaire. Consequently, it must be stated that the study provides a simplified picture of the population and that potential sources of heterogeneity were not considered.

Even if the measurement models finally met all relevant quality criteria, there is clearly room for an improvement of the indicator sets. For one thing, the high level of cross loadings between two indicators of Brand Loyalty and Overall Brand Equity sheds some doubt on the discriminant validity of the constructs and indicates that there might be an overlap between the measurements.¹²⁰⁷ Consequently, it might be useful to reassess the model by applying a revised set of indicators for the two brand equity components. Moreover, as was already outlined in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, the elimination of the Functionality item from the formative Perceived Quality construct can be seen critically from a content validity perspective. For reasons of simplicity and questionnaire length, the study also relies on single-item constructs for Brand Awareness, Brand Familiarity, Uniqueness of Brand Associations, and Brand Trust, perhaps limiting the corresponding measurement quality for the constructs.¹²⁰⁸ In fact, in review processes, the use of single-item measures is often considered a drastic error.¹²⁰⁹ However, in light of more recent publications on the subject, which emphasize their appropriateness under certain circumstances such as construct concreteness, semantic redundancy of indicators, and a subordinate role within a model, the decision to apply single-item measures seemed justifiable.¹²¹⁰

Finally, the initially suggested model can surely be criticized for a lack of parsimony that was mainly a result of the individual consideration of brand associations' valence, uniqueness, and accessibility.¹²¹¹ However, this step seemed justified since no accepted set of property-specific associations had been developed in previous studies, and a separate examination of the facets promised valuable insights in how brand equity is built in a property context. The findings of the empirical study demonstrate that accessibility, uniqueness, and valence clearly differ in their role and nature within the overall brand equity model, thus supporting the decision for a less parsimonious model.

¹²⁰⁷ See HENSELER/RINGLE/SINKOVICS (2009), p. 299; RINGLE (2004), p. 25.

¹²⁰⁸ See MOOI/SARSTEDT (2011), pp. 28-29; SARSTEDT/WILCZYNSKI (2009), p. 223.

¹²⁰⁹ See WANOUS/REICHERS/UDY (1997), p. 247; JACOBY (1978), p. 93.

¹²¹⁰ See DIAMANTOPOULOS et al. (2012), pp. 446-448; BERGKVIST/ROSSITER (2009), p. 619; FUCHS/DIAMANTOPOULOS (2009), pp. 206-207.

¹²¹¹ See HAIR et al. (2014), p. 35; WEIBER/MÜHLHAUS (2010), p. 172.

5 Conclusion and Outlook

As a last step, this chapter provides a summary of the main findings regarding the guiding research questions outlined in Section **Fehler! Verweisquelle konnte nicht gefunden werden..** Afterward, implications for research and practice are derived, and relevant limitations are emphasized as potential reference points for future contributions in this field.

5.1 Summary of the Main Findings

In the following, the research questions that were developed in the beginning of this work are used as a guideline to summarize the main study findings. Initially, the subordinate questions are answered before an overall conclusion regarding the key question is drawn. Since the results of both empirical studies were already discussed in more detail in Sections 3.5 and 4.11, only a brief overview is provided at this point.

- 1) *Are brands relevant in an office property context?*
 - a) *What are the main characteristics of the office property setting that might have an influence on the relevance of brands?*

The influencing factors arise mainly from the inherent particularities of office buildings and office real estate markets that characterize office properties as industrial goods. These specifics mainly form the framework of tenants' renting decisions and thus determine the applicability of different brand functions.

Regarding property characteristics, office buildings are among the most durable, complex, heterogeneous, and expensive goods that are inherently unique due to their fixed location. Moreover, they are characterized by their longevity and the duration of their development process. Office markets in Germany exhibit a high level of geographic segmentation and are still nontransparent. In addition, the substantial time lag between a project's initializa-
tion and completion leads to a continuous cyclicity. From an industrial goods' perspec-

tive, office properties are non-substitutable support factors that contribute to occupiers' core processes and strategies to fulfill the requirements of their own customers. Nonetheless, despite the relevance of their functional characteristics, office properties can evoke strong emotional reactions in individuals, a characteristic that makes them stand out against many other industrial goods. In addition, the decision to rent a particular office property ultimately results in an economic, legal, and social relationship with the owners of the building.

Against this background, renting decisions can be characterized as complex multi-person decisions that are not necessarily formalized and that can be influenced by emotional factors. In particular, they are defined by the generally conflicting interests of potential tenants and owners. Leasing decisions are made by individuals that may have different roles within the renting center, contradicting interests, and varying decision criteria for selecting an appropriate office property. In fact, members of a renting center may also have a double role as users of the property. Moreover, few office tenants have a considerable level of real estate expertise and routine in renting situations. Thus, third parties, such as real estate agents or consultants, are often involved in leasing decision processes in order to compensate for respective deficiencies. Depending on the engagement structure, they may temporally act as mediators between the negotiating parties or take the role of a member of the renting center. Finally, it should be noted that renting decisions are long-term multi-stage processes in which the members of a renting center may successively gain considerable levels of market knowledge regarding available office units, since they become acquainted with a relatively high number of office properties.

b) What potential functions do brands have for tenants in an office property context?

Three basic brand functions that denote potential ways customers may benefit from a brand were identified for business-to-business settings: reduction of perceived risk, information efficiency, and representation. Their applicability in an office property leasing context was discussed against the background of the particularities of this setting.

Reduction of perceived risk: The context characteristics strongly suggest that tenants may benefit from a reduction of their perceived risk in leasing decisions. In particular, the high level of complexity, conflicting interests between the negotiating parties and within the renting center, and a lack of real estate expertise may substantially increase the level of uncertainty. In addition, the organizational and personal consequences of selecting an inappropriate office property can be equally serious: companies rely on office space as an important support factor, and respective deficiencies may have an impact on their core processes. This is even aggravated by the long-term horizon of tenant-owner relationships. Moreover, renting center members may be directly affected by negative consequences of a misguided decision if they are also the users of the property and may indirectly experience drawbacks through negative reactions of other dissatisfied users.

Information efficiency: A high level of complexity in leasing decisions and a lack of transparency in real estate markets suggest that potential tenants may benefit from an improved efficiency of brand-related communication. However, it should be noted that a lack of information and expertise can be partially satisfied through involving real estate agents

or consultants. Similarly, members of the renting center may conduct extensive market screening processes and become familiar with a growing number of available office properties. Overall, it can be assumed that potential tenants may generally benefit from brands regarding the efficiency of information in leasing processes. Nonetheless, these advantages may lose their importance when real estate professionals with high levels of market knowledge are involved or extensive market screening processes are conducted.

Representation: An inherent characteristic of office properties is their high level of visibility and their points of contact with a multiplicity of stakeholders. In particular, companies as tenants can be directly associated with their office properties by their employees, customers, and third parties. Thus, their chosen residence becomes part of their own appearance in the market. Moreover, office properties can cause substantial levels of emotional arousal and excitement due to their aesthetical dimension. Overall, these aspects strongly suggest that office tenants may benefit from the representative character of brands.

c) How is an office property's brand status related to its economic performance?

The first empirical study was more exploratory in nature and aimed at exploring the relationship between an office property's brand status and its market value while controlling for potential covariates. Moreover, interaction effects between an office property's brand status and the covariates were examined. In order to account for the hierarchical data structure resulting from the longitudinal character of the data and the spatial structure of real estate markets, a multilevel analysis was applied.

A significant ($p < 0.001$) positive relationship between an office property's brand status and its value was estimated while controlling for the year of observation, building age, lettable area, and city size in terms of inhabitants. The results indicated an expected change of 18.1% in the conditional geometric mean of the property value between a non-branded and a branded office property. No significant city-level slope variance was detected for the brand status variable, which implied a stable relationship across cities. A significant ($p < 0.01$) but relatively small interaction effect was identified between a property's brand status and its rent, suggesting that for branded properties, the positive relationship between a property's rent and its value is weaker than in the case of non-branded properties. Consequently, it can be assumed that branding may be associated with decoupling a building's rental situation and its market value. Finally, accounting for all modeled fixed and random effects, a comparison of fitted values for branded and non-branded observations on the city level demonstrated that property branding is related to a higher predicted property value in all cities of the sample apart from Leipzig. Regarding these findings, however, one must note that a direct causality between a property's brand status and its market value cannot be established based on the statistical results alone.

2) How can strong brands be built in an office property context?

a) Which existing brand equity model provides an appropriate basis for conceptualizing the construct in an office property context?

A customer-based brand equity perspective was chosen to reflect that brands reside in individuals' minds and to allow for deriving conclusions on how brand equity is built in this context. Regarding the conceptualization of the brand equity concept, practice-based approaches proved unsuitable due to their lack of theoretical foundation and their fragmen-

tary documentation, which substantially complicates a replication of the respective models. Based on a literature review of research-based approaches to conceptualizing brand equity in a business-to-business context, AAKER's (1991, 1996) model was identified as an appropriate point of reference. The author's approach is well-documented, and dimensions used in the majority of the studies reviewed can be traced back to the five dimensions suggested by Aaker: brand awareness, brand associations, perceived quality, brand loyalty, and other proprietary assets.

b) What model adjustments are necessary to meet the particularities of the office property context?

The necessary adjustments built mainly upon the work of earlier authors that examined the customer-based brand equity concept in a business-to-business context. The following adaptations were made to fit the context: (1) In accordance with the majority of publications in this field, the fifth dimension (other proprietary brand assets) was not considered as it does not reflect a customer-based perspective on brand equity. (2) Brand Trust was included as a separate component in the model in order to account for the particular importance of tenant-owner relationships. (3) Brand Familiarity was also incorporated as an individual construct. In this way, the model reflected that lower levels of awareness, such as recognition or recall, might not be sensitive enough to capture a brand's salience, since tenants' extensive search activities might result in considerable market knowledge regarding available office units. (4) Brand Awareness was retained in the model as a necessary basis for building brand-related knowledge, although no direct relationship between the construct and overall brand equity was assumed. (5) The Brand Associations dimension was split up into three facets (Accessibility, Valence, and Uniqueness), which were integrated in the model as individual constructs. In this way, additional insights into the interrelations and relevance of these association facets were achieved. (6) LAVIDGE/STEINER's (1961) hierarchy-of-effects model was chosen as a basic framework and theoretical fundament for the hypothesized relationships between the brand equity components.

c) What are the key drivers of brand equity in an office property context and how are they interrelated?

The second study had a confirmatory character and examined how brand equity is built in individuals' minds in an office property leasing context. The developed brand equity model was estimated with partial least squares structural equation modeling and showed a satisfactory level of variance explanation regarding Overall Brand Equity. Brand Associations, Perceived Quality, Brand Loyalty, and Brand Trust were identified as the most relevant brand equity components in terms of their total effect on the outcome variable. Below-average total effects were found for Brand Awareness, Uniqueness of Brand Associations, Brand Familiarity, and Accessibility of Brand Associations.

The hypothesized relationships between the brand equity components were only partially confirmed. In particular, Brand Awareness in terms of brand recall showed no significant direct or indirect relations with any other brand equity element. Thus, its role seems questionable regarding its contribution to building brand equity, which might be attributed partially to respondents' high level of market expertise. Consequently, while Brand Awareness generally is a necessary condition to establish brand-related knowledge in custom-

ers' minds, the relevance of brand recall as a predictor of Overall Brand Equity seems highly limited in a property context. Brand Familiarity showed a positive relation with the Accessibility of Brand Associations, indicating that knowledge on familiar property brands is more readily available in individuals' minds. Similarly, higher levels of Brand Familiarity were associated with a higher proportion of brand-specific associations reflecting the Uniqueness of Brand Associations. The Accessibility of Brand Associations was positively related to Brand Loyalty and the Valence of Brand Associations. However, the construct showed a significant negative direct relation with Overall Brand Equity. One may conclude that it is not enough that associations are easily retrieved from memory; they also should relate to a positive perception of the brand reflected in their favorability, corresponding quality perceptions, and feelings of trust and loyalty. Nonetheless, the total effect of Accessibility of Brand Associations on the Overall Brand Equity construct was insignificant. Therefore, its overall importance in building brand equity for a property brand seems limited. Likewise, no significant total effect was found for Uniqueness of Brand Associations. However, a significant positive relation with Accessibility of Brand Associations and Brand Loyalty was detected, indicating that unique brand associations may contribute to the retrieval of brand-related associations from memory and may drive loyal attitudes. Besides its positive direct effect, Valence of Brand Associations exhibited a strong indirect effect on Overall Brand Equity via its positive total effects on Perceived Quality, Brand Trust, and Brand Loyalty. In this regard, however, it should be noted that Valence of Brand Associations had not a significant direct but an indirect positive effect on individuals' trust in the people behind a property brand via Perceived Quality. This implies that favorable associations toward a brand might not necessarily translate into higher levels of trust in the people owning the property. Individuals' perception of trust is rather influenced by the favorability of their brand associations via their quality perceptions. The empirical study identified Perceived Quality as a major driver of a property brand's brand equity with a significant positive direct effect on Overall Brand Equity and an indirect effect via Brand Loyalty and Brand Trust. Consequently, one may conclude that the development of attitudinal loyalty, trust, and, ultimately, a positively biased response toward a property brand is influenced by individuals' notion that an office property has superior abilities in fulfilling their needs compared to other properties. Brand Trust was found to have a significant positive direct impact on Brand Loyalty, indicating that building trust is a relevant component in establishing a long-term valued tenant-owner relationship. Finally, Brand Loyalty in terms of an intrinsic bond to the brand was highlighted as a major brand equity component and direct antecedent of Overall Brand Equity. Thus, establishing a feeling of attachment and belonging is a relevant factor in building brand equity for property brands. Altogether, the general sequence of steps in building brand equity in individuals' minds as suggested by the underlying hierarchy of effects was partially confirmed. While the general flow of effects from more cognitive to affective and conative elements was supported, not all hypothesized relations were significant.

Focusing on the largest significant positive direct effects between the proposed brand equity components, one can assume that increasing levels of brand familiarity drive the development of unique brand associations and improve their accessibility. However, the brand-related associations must be favorable in order to improve perceptions of quality, contribute to brand loyalty, and ultimately drive brand equity. Likewise, perceptions of high

quality may drive trust and brand loyalty, which in turn contribute to a brand's overall brand equity reflected in tenants' overall perceptions of value for the cost, prestige, enthusiasm, and their general preference for the brand.

5.2 Implications for Research and Practice

Several implications for research and practice were already discussed following the first and second study in Sections 3.5 and 4.11.1. For this reason, the main implications are only briefly summarized at this point and supplemented by conclusions that concern this work as a whole.

From a research perspective, this work is the first comprehensive contribution to theoretically and empirically examine brands in an office property context. The study initially characterizes property brands as brands in a business-to-business context and highlights particularities regarding their potential functions. In this way, it provides a basis and point of reference for future research in this field. Moreover, this work contributes to examining the brand equity construct across different business-to-business sectors and meets the need to further scrutinize the overall relevance and applicability of the brand concept in industrial markets. In particular, the proposition of a hierarchy of effects between the brand equity components and the consideration of individual brand association facets may add to the extant literature in this context. For real estate researchers, the adequacy of multilevel analyses is emphasized as an appropriate approach to account for the hierarchical structure of real estate market data.

For real estate practitioners, this work contributes mainly to reducing the prevalent uncertainty regarding the relevance of brands in an office property sector. In particular, the study demonstrates that brands may fulfill valuable functions for tenants in leasing decision processes and during tenancy. More specifically, decision makers benefit from a reduction of perceived risk and the representation of their company through its residence. Moreover, the efficiency of brand-related communication activities can be improved, especially in situations where no real estate agents or consultants are involved in the leasing decision.

The first study had three main implications for real estate practitioners. For one thing, real estate practitioners' intuitive perceptions and assumptions of differences in the value of branded and non-branded office properties seem to be justified: a property brand is associated with a higher market value in comparison to a non-branded property that is comparable with respect to the year of observation, its age, contract rent, usable area, and the size of its respective macro location. Secondly, this positive relationship seems to be stable across cities, indicating that building strong property brands may be relevant across different spatial market segments. Finally, for branded buildings, the relationship between their contract rent and their overall market value is weakened in comparison to non-branded properties. Consequently, one can assume that building a strong property brand may contribute to decoupling the market value of a property from its current tenant situation, which might be of particular importance regarding the cyclicity of real estate markets. Altogether, the study findings are generally encouraging for owners that invest in building strong brands for their office properties. By contrast, the still prevalent lack of in-

terest in property brands and highly limited brand budgets seem even more questionable against this background.

The findings of the second study support real estate practitioners in their brand building activities primarily by identifying relevant components of brand equity that should be taken into account. In particular, the study emphasizes the favorability of tenants' brand associations, perceptions of quality, trust in the people behind the property, and brand loyalty in terms of an intrinsic bond, which should be in focus. Consequently, marketers should create direct and indirect brand experiences that contribute to establishing favorable brand associations. In this regard, not only functional aspects but also brand attributes that tap into the direction of a brand's representative function can be highlighted. Nonetheless, perceived quality is an important element in supporting tenants' trust in the people behind the property and their attitudinal loyalty, both of which are cornerstones of a valued tenant-owner relationship. Therefore, ensuring a tenant that an office property is capable of supporting the company's requirements regarding its core processes is a basic aspect of overall quality perception. A more detailed consideration of the quality facets highlights the importance of a building's visual appearance and location as main elements of an office property's overall quality from a tenant perspective. By contrast, brand building efforts that aim primarily at creating brand awareness in terms of recall seem less promising. In fact, potential tenants' extensive search for information regarding available office properties and the involvement of real estate agents or consultants result in a relatively high level of market knowledge and potential acquaintance with numerous office properties. Thus, occupying a position in tenants' consideration set alone does not necessarily result in high levels of brand equity. Similarly, the uniqueness of brand-related associations clearly plays only a minor role in building brand equity in an office property context, which might be attributable to buildings' inherent heterogeneity due to their location and building specifications. Likewise, high levels of brand familiarity and accessibility of brand associations do not drive brand equity directly but have only an indirect effect. Thus, communication activities aimed primarily at creating high numbers of brand experiences, providing comprehensive and detailed information on the property, or establishing readily available associations are limited in their effectiveness. Rather, tenants' familiarity with a brand and their perception of fluency when retrieving brand-related associations contribute indirectly to building strong property brands when they are related to favorable associations and high levels of perceived quality, trust, and loyalty.

Regarding the sequence of brand building steps, the different stages in office leasing processes can provide a useful framework to focus on different activities. In early stages, where interested parties successively collect information on available properties, brand building efforts may center on tenants' direct and indirect brand-related experiences through exposés and site visits as a basis for establishing favorable brand associations. It seems recommendable at this stage to emphasize quality-related aspects of a building in order to enhance quality perceptions, but properties' ability to evoke emotional responses should not be disregarded. In the next step of the leasing process, which relates to initial negotiations with selected property owners, brand building activities may focus on personal contact as a means to establish a trusted relationship with the potential tenant and

foster an intrinsic bond with the brand, which can be the foundation of a long-term tenant-owner relationship.

The Importance-Performance-Matrix-Analysis was suggested as a useful tool that may support real estate practitioners in drawing conclusions on the brand equity status of a brand, its strengths and weaknesses, and potential areas for improvement. For the data sample of this study, the analysis highlighted that the reviewed brands on average have their main strengths in areas that are of lesser importance for building brand equity in an office property context, such as accessibility and uniqueness of brand associations. By contrast, property brands' perceived quality and tenants' feeling of attachment and bonding might call for more attention as they exhibit relatively low performance scores and above-average importance regarding their total effects on brand equity.

5.3 Limitations and Research Perspectives

Since the specific shortcomings of the first and second study were already discussed in Sections 3.5 and 4.11.2, the following considerations focus mainly on limitations that concern this work as a whole. On this basis, several points of reference for future research in the field of property brands are highlighted.

As a first point, one must state that this work does not provide evidence for the relationship between the suggested components of brand equity and the economic success of an office property. Indeed, the relationship between a property's overall brand status and its market value was examined, and main drivers of brand equity were identified. However, in the first study, the simplified differentiation between branded and non-branded office properties did not allow for a more detailed examination of the underlying brand equity elements, and in the second study, the proposed brand equity model did not consider economic key figures as outcomes. Consequently, an examination of the economic relevance of the brand equity components may be a main point of reference for future research. However, it should be noted that the lack of transparency in real estate markets and the market participants' overall hesitance to participate in research impose major obstacles. Detailed case studies in cooperation with property owners might be an alternative in this regard.

This work is additionally limited to its focus on external brand building, although the importance of the tenant-owner relationship emphasizes the role of employees as brand representatives. Thus, a relevant aspect that might contribute to building strong property brands has not been taken into account. Future research might consider this aspect and suggest another partial model focusing on internal brand building, or propose an integrated model combining both perspectives.

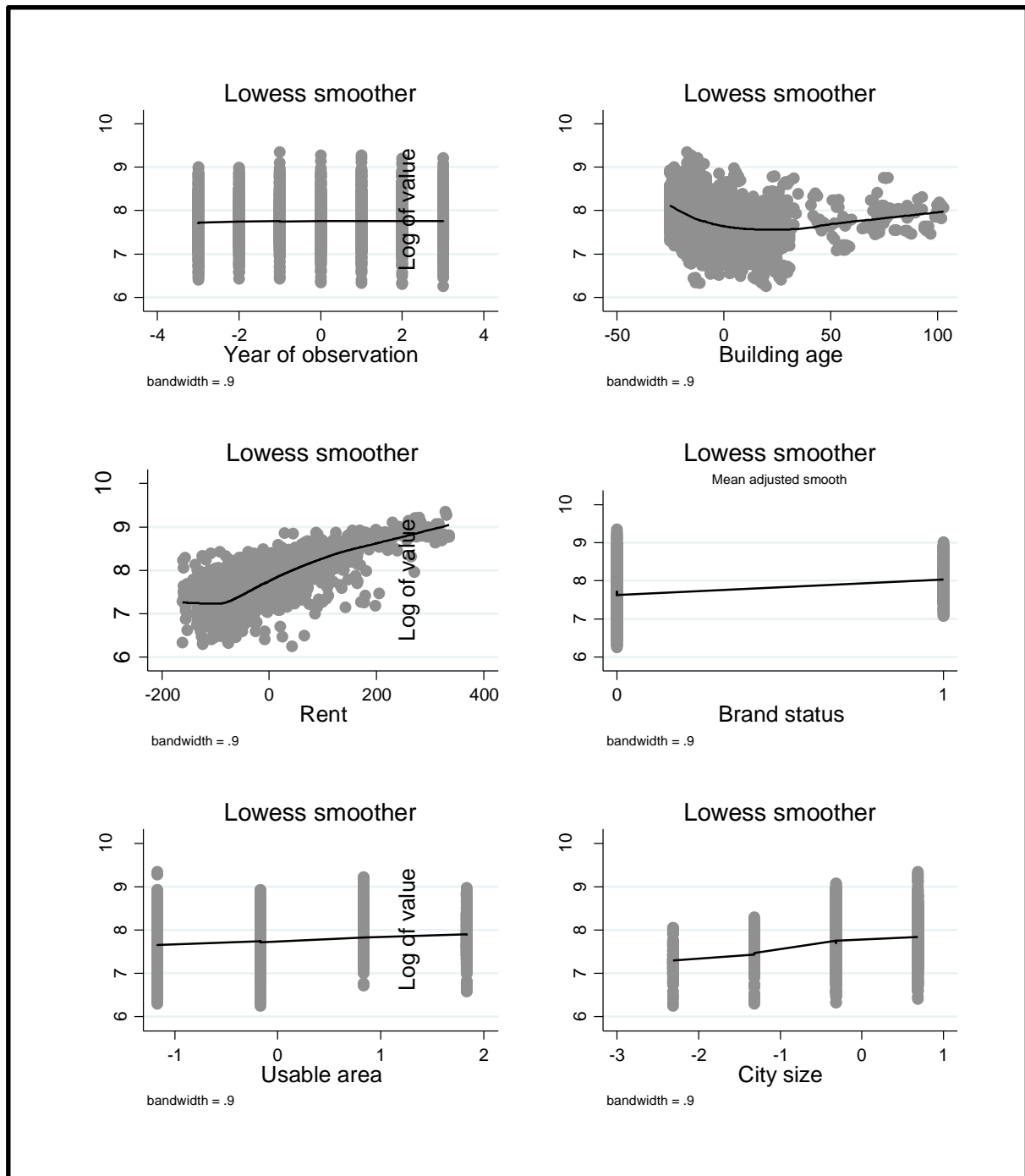
Against the background of the particularities of business-to-business markets, this work repeatedly emphasized the importance of the tenant-owner relationship. The consideration of this aspect through brand loyalty and attitudinal brand loyalty seems simplified compared to the complexity of the phenomenon. A closer examination of this relationship and its main determinants promises insights into how valued tenant-owner relationships can be built and maintained across a building's lifecycle.

Future contributions might also focus on expanding the limited typological focus of this work. In fact, it might provide valuable findings to go beyond office property brands and expand the scope of the investigation to include other property types. The area of shopping centers and residential properties especially might be of high relevance for property brands. Similarly, investigating property brands in other geographic markets and cultures might help to uncover cultural differences in the perception of property brands and identify particularities regarding the brand equity drivers. Particularly in light of continuously increasing international activities of real estate investors, but also from the perspective of a more and more multicultural society in Germany, detailed knowledge of cultural particularities seems vital to ensure property brands' success. A similar limitation is that the second study of this work focuses only on leasing situations. Therefore, other relevant situational settings, such as transaction processes or valuations, are neglected. Examining brand functions and brand equity components against the background of different settings might contribute to understanding how brand equity is built in a property context.

The customer-based perspective on brands that was applied in this work provided useful insights regarding relevant brand equity components and their relationships. From a real estate practitioner's perspective, however, a brand's monetary value is also of interest. In particular, the question arises whether property brands should be considered in the valuation of properties and how their monetary value can be determined. A financial perspective on the brand equity concept may prove a valuable field of research. Moreover, this study did not provide recommendations regarding operational marketing activities that may be used to implement the different brand building steps. Consequently, future contributions may focus on the antecedents of brand equity and examine the relationships between different elements of the real estate marketing mix and the brand equity components.

Appendix

Appendix 1: Linearity Check – Independent Variables Plotted against Logvalue



Source: Own illustration.

Note: The variables building age and rent show linear and slightly curvilinear characteristics. A series of non-linear transformations of the predictors ($x^{0.5}$; \log ; x^2) was carried out in order to reduce the curvilinear component in the relationship between the dependent and the independent variables. However, a visual inspection did not find a substantial improvement. "In this case the linear component may be strong enough that not much is lost by ignoring the curvilinear component (...)"¹²¹². For reasons of simplicity and interpretability, a linear relationship was assumed for both predictors.

¹²¹² TABACHNICK/FIDELL (2007), p. 84.

Appendix 2: Questionnaire of the Pre-Survey

Question	Wording
Introduction	<i>All respondents were informed about the purpose, research context and likely duration (5 minutes) of the survey. They were asked to concentrate on the interview, avoid potential disturbances and answer spontaneously and freely. Moreover, participants were ensured that all data is made anonymous and is only published or made available to third parties in an aggregated form.</i>
Introduction to 1	You surely know a variety of office properties in "city where the company/branch office is located". Please spontaneously answer to the following question and try to avoid controlled or overly reconsidered answers.
1	Please, name up to five well-known office properties in "city where the company/branch office is located" that spontaneously come into your mind!
Introduction to 2	In order to enhance the scope of our study we would like to know which other professional real estate agents with a focus on office properties might be included in our set of respondents.
2	Please, name all professional real estate agents in "city where the company/branch office is located" that have a focus on office properties!

Source: Own illustration.

Appendix 3: Main Study Questionnaire

Section	Question	Wording	Indicators
Introduction	-	<i>All respondents were informed about the purpose, research context and likely duration (30 minutes) of the survey. They were asked to concentrate on the interview, avoid potential disturbances and answer spontaneously and freely. Moreover, participants were ensured that all data is made anonymous and is only published or made available to third parties in an aggregated form.</i>	-
	1.1	How many people are employed in your branch office?	(Number of Employees)
Selection of Property Brands	-	You surely know a variety of office properties in Germany. Please spontaneously answer to the following questions and try to avoid controlled or overly reconsidered answers.	
	2.1	Apart from properties that have been let or sold by your company during the last 5 years, please, name up to five office properties in Germany that spontaneously come into your mind!	AWA1 (Recall Rank) AWA2 (Top-of-Mind Recall)
	2.2	Please indicate your level of familiarity with (property brand name) on a scale from 1 'I am unfamiliar with (property brand name)' to 7 'I am very familiar with (property brand name)'!	FAM1 (Overall Familiarity)
Assessment of Property Brands	-	(Property brand name) is a property that you know. Please think of (property brand name) and say everything that comes to mind. In addition to verbal associations, please try to describe feelings, impressions, and pictures that you associate with the property in as much detail as possible. As example: When you think of the Empire State Building, you might recall associations such as the city of New York, the characteristic shape of the building, or its illumination at night. Moreover, you might also think of more abstract issues such as the American dream, freedom, or power. Similarly, personal experiences and memories such as your last vacation might come up to your mind. Please, now, think of (property brand name) and name everything that you associate with (property brand name).	-
	3.1	Please, now, name everything that you associate with (property brand name)!	UNI1 (Uniqueness)
	3.2	Do you perceive (association) as a pleasant or unpleasant aspect of (property brand name) on a scale from 1 "very unpleasant" to 7 "very pleasant"?	VAL1 (Relevance-Weighted Mean Favorability)
	3.3	How relevant is (association) for your overall judgement of (property brand name) on a scale from 1 "not relevant at all" to 7 "very relevant"?	
	-	Please, think again of (property brand name) and focus on the mental picture in front of your inner eye.	-
	3.4	How clear and detailed is your mental picture of (property brand name) on a scale from 1 "very unclear and undetailed" to 7 "very clear and detailed"?	ACC2 (Clarity and Detail)
	3.5	How attractive is your mental picture of (property brand name) on a scale from 1 "very unattractive" to 7 "very attractive"?	VAL2 (Attractiveness)
	3.6	How easy was it for you to retrieve your mental picture of (property brand name) on a scale from 1 "very difficult to retrieve" to 7 "very easy to retrieve"?	ACC1 (Ease of Retrieval)
	-	In the following you will hear several statements about (property brand name). Please indicate on the basis of your subjective impression and beliefs to which extent you agree with these statements on a scale from 1 "I strongly disagree" to 7 "I strongly agree".	-
	3.7	Compared to other office buildings in Germany, (property brand name)'s visual appearance is of excellent quality. (A property's visual appearance refers to its architectural design, aesthetics and overall appeal.)	QAL1 (Visual Appearance)
	3.8	Compared to other office buildings in Germany, (property brand name)'s equipment is of excellent quality. (A property's equipment comprises all fixtures, fittings, furnishings, and facilities of the property such as sun protection, bathrooms, and kitchen.)	QAL2 (Equipment)
	3.9	Compared to other office buildings in Germany, (property brand name)'s flexibility is of excellent quality. (A property's flexibility is related to the possibility to adapt the property according to varying needs especially regarding spatial structures and technical equipment.)	QAL3 (Flexibility)
	3.10	Compared to other office buildings in Germany, (property brand name)'s functionality is of excellent quality. (A property's functionality describes its adequacy and convenience to efficiently meet the work-related requirements of its occupiers and support their productivity.)	QAL4 (Functionality)
	3.11	Compared to other office buildings in Germany, (property brand name)'s location is of excellent quality. (A property's location refers to the conditions of its micro and macro surroundings in terms of plot layout, infrastructure, accessibility, neighbourhood, and other relevant aspects determining the locational circumstances.)	QAL5 (Location)
	3.12	Compared to other office buildings in Germany, (property brand name)'s service offer is of excellent quality. (A property's service offer refers to the provision of additional services for occupiers, such as reception, concierge or relocation services.)	QAL6 (Service Offer)
	3.13	Overall, leasing in (property brand name) is worth the money.	OBE3 (Value for the Cost)
	3.14	Altogether, (property brand name) is of excellent quality.	QAL7 (Overall Perceived Quality)
	3.15	I feel very attached to (property brand name).	LOY1 (Attachment)
	3.16	I would deeply regret, if (property brand name) did not exist anymore.	LOY2 (Regret)
	3.17	The owner and the people behind (property brand name) are very trustworthy!	TRU1 (Overall Brand Trust)
	3.18	It is very prestigious to lease in (property brand name).	OBE2 (Prestige)
	3.19	People who work in (property brand name) are very enthusiastic about the property.	OBE1 (Enthusiasm)
	3.20	I would recommend a close friend to lease in (property brand name).	LOY3 (Willingness to Recommend)
	3.21	Overall, it is an excellent decision to lease in (property brand name).	OBE4 (Overall Lease Preference)

Source: Own illustration.

Appendix 4: Independent Group *t*-test – Male and Female Respondants

	Levene-Test for Equality of Variances		t-Test						
	F	Significance	T	df	Significance (two-tailed)	Mean		Mean Difference	Std. Err. of the Mean Difference
						Male	Female		
Recall Rank	0.336	0.563	-0.141	229.000	0.888	3.241	3.275	-0.034	0.242
Overall Familiarity	1.217	0.271	0.114	229.000	0.909	4.911	4.875	0.036	0.315
Clarity and Detail (of Mental Image)	0.035	0.852	-0.566	229.000	0.572	5.916	6.050	-0.134	0.236
Ease of Retrieval (of Mental Image)	0.288	0.592	0.050	229.000	0.960	6.037	6.025	0.012	0.235
Relevance-Weighted Mean Favorability	2.388	0.124	-0.110	229.000	0.913	5.544	5.563	-0.019	0.173
Attractiveness (of Mental Image)	0.017	0.896	0.663	229.000	0.508	5.115	4.975	0.140	0.211
Uniqueness	0.172	0.679	0.401	229.000	0.689	0.893	0.882	0.011	0.028
Visual Appearance	0.700	0.404	0.426	229.000	0.671	5.833	5.750	0.082	0.194
Equipment	2.077	0.151	0.139	229.000	0.889	5.377	5.350	0.027	0.194
Flexibility	0.000	0.993	-1.540	229.000	0.125	4.775	5.125	-0.350	0.227
Functionality	0.327	0.568	-2.363	229.000	0.019	4.974	5.475	-0.501	0.212
Location	2.732	0.100	-0.013	229.000	0.990	5.597	5.600	-0.003	0.251
Service Offer	0.018	0.893	-1.289	229.000	0.199	5.120	5.375	-0.255	0.198
Overall Perceived Quality	0.393	0.532	0.245	229.000	0.806	5.644	5.600	0.044	0.179
Overall Brand Trust	0.257	0.613	-0.863	229.000	0.389	4.916	5.125	-0.209	0.242
Attachment	1.559	0.213	0.240	229.000	0.811	4.026	3.950	0.076	0.318
Regret	3.695	0.056	1.385	229.000	0.167	5.094	4.650	0.444	0.321
Willingness to Recommend	2.409	0.122	-0.830	229.000	0.407	4.869	5.050	-0.181	0.218
Enthusiasm	0.486	0.486	-0.458	229.000	0.648	5.183	5.275	-0.092	0.201
Prestige	1.994	0.159	-0.320	229.000	0.749	5.607	5.675	-0.068	0.211
Value for the Cost	0.675	0.412	-1.298	229.000	0.196	5.052	5.325	-0.273	0.210
Overall Lease Preference	0.471	0.493	-0.853	229.000	0.395	5.105	5.275	-0.170	0.200

Source: Own illustration.

Appendix 5: Bootstrapping Results – Outer Loadings of Reflective Measurement Models

	Original Sample (O)	Sample Mean	Standard Error (STERR)	95% Confidence Intervals (Bias Corrected)		T Statistics (O/STERR)	P Values
				Low	Up		
RecallRank	1.000	1.000	0.000	-	-	-	-
Overall Familiarity	1.000	1.000	0.000	-	-	-	-
Clarity and Detail (of Mental Image)	0.949	0.949	0.011	0.928	0.964	87.738	0.000
Ease of Retrieval (of Mental Image)	0.942	0.942	0.013	0.917	0.959	74.933	0.000
Relevance-Weighted Mean Favorability	0.874	0.874	0.020	0.832	0.901	42.739	0.000
Attractiveness (of Mental Image)	0.842	0.840	0.030	0.779	0.879	27.775	0.000
Uniqueness	1.000	1.000	0.000	-	-	-	-
Overall Brand Trust	1.000	1.000	0.000	-	-	-	-
Attachment	0.810	0.809	0.034	0.745	0.857	23.876	0.000
Regret	0.749	0.747	0.038	0.675	0.801	19.545	0.000
Willingness to Recommend	0.813	0.813	0.023	0.766	0.845	34.852	0.000
Enthusiasm	0.858	0.857	0.020	0.818	0.887	41.902	0.000
Prestige	0.778	0.777	0.030	0.722	0.820	26.182	0.000
Value for the Cost	0.740	0.740	0.042	0.658	0.798	17.619	0.000
Overall Lease Preference	0.847	0.847	0.022	0.806	0.878	39.364	0.000

Source: Own illustration.

Appendix 6: Bootstrapping Results – Outer Weights of Formative Measurement Models

	Original Sample (O)	Sample Mean	Standard Error (STERR)	95% Confidence Intervals (Bias Corrected)		T Statistics (O/STERR)	P Values
				Low	Up		
Visual Appearance	0.522	0.517	0.082	0.356	0.677	6.385	0.000
Equipment	0.022	0.022	0.097	-0.162	0.220	0.227	0.000
Flexibility	0.326	0.325	0.099	0.137	0.520	3.309	0.821
Location	0.399	0.392	0.085	0.241	0.582	4.683	0.000
Service Offer	0.320	0.315	0.084	0.161	0.492	3.801	0.000

Source: Own illustration.

Appendix 7: Bootstrapping Results – Outer Loadings of Formative Measurement Models

	Original Sample (O)	Sample Mean	Standard Error (STERR)	95% Confidence Intervals (Bias Corrected)		T Statistics (O/STERR)	P Values
				Low	Up		
Visual Appearance	0.700	0.691	0.072	0.544	0.824	9.706	0.000
Equipment	0.620	0.613	0.080	0.458	0.768	7.780	0.000
Flexibility	0.604	0.596	0.075	0.453	0.745	8.031	0.000
Location	0.570	0.570	0.082	0.411	0.729	6.917	0.000
Service Offer	0.612	0.605	0.066	0.474	0.736	9.221	0.000

Source: Own illustration.

Appendix 8: Bootstrapping Results – Direct Effects

Path	Original Sample (O)	Sample Mean (M)	Standard Error (STERR)	T Statistics (O/STERR)	P Values	95% Confidence Level (Bias Corrected)	
						Low	Up
Accessibility of Brand Associations -> Brand Loyalty	0.263	0.262	0.050	5.287	0.000	0.171	0.364
Accessibility of Brand Associations -> Brand Trust	0.100	0.098	0.056	1.783	0.075	-0.005	0.212
Accessibility of Brand Associations -> Overall Brand Equity	-0.155	-0.154	0.054	2.884	0.004	-0.262	-0.052
Accessibility of Brand Associations -> Perceived Quality	0.071	0.071	0.055	1.282	0.200	-0.042	0.176
Accessibility of Brand Associations -> Valence of Brand Associations	0.190	0.191	0.083	2.297	0.022	0.025	0.352
Brand Awareness -> Accessibility of Brand Associations	0.018	0.019	0.053	0.336	0.737	-0.087	0.120
Brand Awareness -> Uniqueness of Brand Associations	0.014	0.015	0.068	0.212	0.832	-0.111	0.154
Brand Awareness -> Valence of Brand Associations	-0.051	-0.052	0.066	0.770	0.441	-0.175	0.086
Brand Familiarity -> Accessibility of Brand Associations	0.498	0.496	0.053	9.327	0.000	0.388	0.597
Brand Familiarity -> Brand Awareness	-0.006	-0.005	0.061	0.101	0.920	-0.124	0.116
Brand Familiarity -> Overall Brand Equity	-0.047	-0.047	0.054	0.862	0.389	-0.154	0.056
Brand Familiarity -> Uniqueness of Brand Associations	0.197	0.195	0.064	3.072	0.002	0.064	0.315
Brand Familiarity -> Valence of Brand Associations	0.116	0.116	0.080	1.451	0.147	-0.035	0.277
Brand Loyalty -> Overall Brand Equity	0.395	0.394	0.063	6.322	0.000	0.268	0.515
Brand Trust -> Brand Loyalty	0.338	0.335	0.050	6.743	0.000	0.243	0.440
Brand Trust -> Overall Brand Equity	0.127	0.122	0.058	2.205	0.027	0.010	0.233
Perceived Quality -> Brand Loyalty	0.139	0.148	0.059	2.374	0.018	0.018	0.247
Perceived Quality -> Brand Trust	0.304	0.317	0.079	3.839	0.000	0.125	0.439
Perceived Quality -> Overall Brand Equity	0.357	0.364	0.056	6.425	0.000	0.241	0.460
Uniqueness of Brand Associations -> Accessibility of Brand Associations	0.176	0.178	0.063	2.810	0.005	0.051	0.299
Uniqueness of Brand Associations -> Brand Loyalty	0.074	0.075	0.047	1.578	0.115	-0.015	0.168
Uniqueness of Brand Associations -> Brand Trust	0.074	0.076	0.063	1.166	0.244	-0.047	0.199
Uniqueness of Brand Associations -> Overall Brand Equity	0.041	0.042	0.039	1.049	0.294	-0.038	0.114
Uniqueness of Brand Associations -> Perceived Quality	-0.097	-0.097	0.050	1.935	0.053	-0.197	0.001
Uniqueness of Brand Associations -> Valence of Brand Associations	0.017	0.020	0.069	0.250	0.803	-0.126	0.145
Valence of Brand Associations -> Brand Loyalty	0.307	0.303	0.062	4.944	0.000	0.190	0.431
Valence of Brand Associations -> Brand Trust	0.142	0.133	0.085	1.668	0.095	-0.012	0.324
Valence of Brand Associations -> Overall Brand Equity	0.202	0.198	0.054	3.738	0.000	0.098	0.309
Valence of Brand Associations -> Perceived Quality	0.564	0.570	0.055	10.306	0.000	0.441	0.658

Source: Own illustration.

Appendix 9: Bootstrapping Results – Indirect Effects

Path	Original Sample (O)	Sample Mean (M)	Standard Error (STERR)	T Statistics (O /STERR)	P Values	95% Confidence Interval (Bias corrected)	
						Low	Up
Accessibility of Brand Associations -> Brand Loyalty	0.145	0.144	0.045	3.219	0.001	0.058	0.233
Accessibility of Brand Associations -> Brand Trust	0.081	0.082	0.032	2.516	0.012	0.023	0.151
Accessibility of Brand Associations -> Overall Brand Equity	0.286	0.286	0.066	4.334	0.000	0.161	0.419
Accessibility of Brand Associations -> Perceived Quality	0.107	0.109	0.050	2.158	0.031	0.013	0.209
Accessibility of Brand Associations -> Valence of Brand Associations							
Brand Awareness -> Accessibility of Brand Associations	0.003	0.002	0.013	0.202	0.840	-0.021	0.031
Brand Awareness -> Brand Loyalty	-0.015	-0.016	0.039	0.399	0.690	-0.089	0.061
Brand Awareness -> Brand Trust	-0.012	-0.013	0.024	0.485	0.628	-0.060	0.033
Brand Awareness -> Overall Brand Equity	-0.029	-0.029	0.042	0.685	0.493	-0.111	0.056
Brand Awareness -> Perceived Quality	-0.026	-0.027	0.040	0.665	0.506	-0.107	0.052
Brand Awareness -> Uniqueness of Brand Associations							
Brand Awareness -> Valence of Brand Associations	0.004	0.005	0.013	0.315	0.752	-0.018	0.035
Brand Familiarity -> Accessibility of Brand Associations	0.035	0.035	0.019	1.816	0.069	0.006	0.082
Brand Familiarity -> Brand Awareness							
Brand Familiarity -> Brand Loyalty	0.291	0.293	0.049	5.963	0.000	0.196	0.385
Brand Familiarity -> Brand Trust	0.143	0.145	0.038	3.743	0.000	0.071	0.220
Brand Familiarity -> Overall Brand Equity	0.154	0.155	0.049	3.154	0.002	0.058	0.252
Brand Familiarity -> Perceived Quality	0.143	0.145	0.046	3.130	0.002	0.051	0.229
Brand Familiarity -> Uniqueness of Brand Associations	0.000	0.000	0.004	0.021	0.983	-0.011	0.008
Brand Familiarity -> Valence of Brand Associations	0.105	0.105	0.046	2.291	0.022	0.020	0.203
Brand Loyalty -> Overall Brand Equity							
Brand Trust -> Brand Loyalty							
Brand Trust -> Overall Brand Equity	0.134	0.132	0.028	4.765	0.000	0.087	0.198
Perceived Quality -> Brand Loyalty	0.103	0.107	0.032	3.184	0.001	0.042	0.168
Perceived Quality -> Brand Trust							
Perceived Quality -> Overall Brand Equity	0.134	0.138	0.035	3.820	0.000	0.065	0.203
Uniqueness of Brand Associations -> Accessibility of Brand Associations							
Uniqueness of Brand Associations -> Brand Loyalty	0.082	0.082	0.050	1.651	0.099	-0.023	0.173
Uniqueness of Brand Associations -> Brand Trust	0.008	0.007	0.030	0.257	0.797	-0.054	0.066
Uniqueness of Brand Associations -> Overall Brand Equity	0.035	0.035	0.053	0.655	0.513	-0.071	0.138
Uniqueness of Brand Associations -> Perceived Quality	0.041	0.043	0.040	1.020	0.308	-0.044	0.115
Uniqueness of Brand Associations -> Valence of Brand Associations	0.034	0.033	0.018	1.911	0.056	0.007	0.080
Valence of Brand Associations -> Brand Loyalty	0.185	0.190	0.037	5.028	0.000	0.113	0.255
Valence of Brand Associations -> Brand Trust	0.172	0.181	0.048	3.551	0.000	0.074	0.261
Valence of Brand Associations -> Overall Brand Equity	0.436	0.441	0.047	9.284	0.000	0.343	0.526
Valence of Brand Associations -> Perceived Quality							

Source: Own illustration.

Appendix 10: Bootstrapping Results – Total Effects

Path	Original Sample (O)	Sample Mean (M)	Standard Error (STERR)	T Statistics (O/STERR)	P Values	95% Confidence Interval (Bias corrected)	
						Low	Up
Accessibility of Brand Associations -> Brand Loyalty	0.407	0.405	0.063	6.490	0.000	0.281	0.529
Accessibility of Brand Associations -> Brand Trust	0.181	0.180	0.061	2.988	0.003	0.068	0.305
Accessibility of Brand Associations -> Overall Brand Equity	0.131	0.131	0.074	1.777	0.076	-0.018	0.272
Accessibility of Brand Associations -> Perceived Quality	0.178	0.181	0.071	2.513	0.012	0.038	0.316
Accessibility of Brand Associations -> Valence of Brand Associations	0.190	0.191	0.083	2.297	0.022	0.025	0.352
Brand Awareness -> Accessibility of Brand Associations	0.020	0.021	0.055	0.375	0.707	-0.086	0.124
Brand Awareness -> Brand Loyalty	-0.015	-0.016	0.039	0.399	0.690	-0.089	0.061
Brand Awareness -> Brand Trust	-0.012	-0.013	0.024	0.485	0.628	-0.060	0.033
Brand Awareness -> Overall Brand Equity	-0.029	-0.029	0.042	0.685	0.493	-0.111	0.056
Brand Awareness -> Perceived Quality	-0.026	-0.027	0.040	0.665	0.506	-0.107	0.052
Brand Awareness -> Uniqueness of Brand Associations	0.014	0.015	0.068	0.212	0.832	-0.111	0.154
Brand Awareness -> Valence of Brand Associations	-0.047	-0.047	0.066	0.712	0.476	-0.175	0.087
Brand Familiarity -> Accessibility of Brand Associations	0.533	0.531	0.051	10.365	0.000	0.426	0.629
Brand Familiarity -> Brand Awareness	-0.006	-0.005	0.061	0.101	0.920	-0.124	0.116
Brand Familiarity -> Brand Loyalty	0.291	0.293	0.049	5.963	0.000	0.196	0.385
Brand Familiarity -> Brand Trust	0.143	0.145	0.038	3.743	0.000	0.071	0.220
Brand Familiarity -> Overall Brand Equity	0.107	0.109	0.058	1.868	0.062	-0.007	0.218
Brand Familiarity -> Perceived Quality	0.143	0.145	0.046	3.130	0.002	0.051	0.229
Brand Familiarity -> Uniqueness of Brand Associations	0.197	0.196	0.064	3.078	0.002	0.063	0.312
Brand Familiarity -> Valence of Brand Associations	0.221	0.222	0.064	3.444	0.001	0.092	0.343
Brand Loyalty -> Overall Brand Equity	0.395	0.394	0.063	6.322	0.000	0.268	0.515
Brand Trust -> Brand Loyalty	0.338	0.335	0.050	6.743	0.000	0.243	0.440
Brand Trust -> Overall Brand Equity	0.261	0.254	0.055	4.741	0.000	0.155	0.367
Perceived Quality -> Brand Loyalty	0.242	0.254	0.068	3.569	0.000	0.089	0.360
Perceived Quality -> Brand Trust	0.304	0.317	0.079	3.839	0.000	0.125	0.439
Perceived Quality -> Overall Brand Equity	0.492	0.501	0.062	7.890	0.000	0.349	0.598
Uniqueness of Brand Associations -> Accessibility of Brand Associations	0.176	0.178	0.063	2.810	0.005	0.051	0.299
Uniqueness of Brand Associations -> Brand Loyalty	0.156	0.157	0.062	2.534	0.011	0.037	0.277
Uniqueness of Brand Associations -> Brand Trust	0.081	0.083	0.065	1.247	0.212	-0.047	0.210
Uniqueness of Brand Associations -> Overall Brand Equity	0.076	0.077	0.064	1.189	0.235	-0.048	0.201
Uniqueness of Brand Associations -> Perceived Quality	-0.056	-0.053	0.063	0.891	0.373	-0.177	0.067
Uniqueness of Brand Associations -> Valence of Brand Associations	0.051	0.053	0.067	0.756	0.449	-0.090	0.175
Valence of Brand Associations -> Brand Loyalty	0.491	0.493	0.052	9.483	0.000	0.384	0.587
Valence of Brand Associations -> Brand Trust	0.314	0.314	0.063	4.945	0.000	0.182	0.434
Valence of Brand Associations -> Overall Brand Equity	0.638	0.639	0.047	13.603	0.000	0.533	0.720
Valence of Brand Associations -> Perceived Quality	0.564	0.570	0.055	10.306	0.000	0.441	0.658

Source: Own illustration.

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