

ON THE MEASURE OF PRIVATE RENTAL MARKET REGULATION INDEX AND ITS EFFECT ON HOUSING RENTS: CROSS COUNTRY EVIDENCE

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On the Measure of Private Rental Market Regulation Index and Its Effects on Housing Rents: Cross-Country Evidence

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Abstract

The objective of this paper is twofold: first, we construct and analyze a country-specific time-varying private rental regulation index for 18 developed economies starting from 1973 till 2014. Second, we analyze the effects of our rental regulation index on the housing rental markets across 18 countries and states. Unlike the previous rent regulation indices in the literature, our index, which is based on the detailed country reports, not only covers 18 developed economies over 42 years but also combines both tenure security and rent laws. Our index covers the classic aspects of first- and second-generation rent control and helps to identify three different phases of rental market regulation for the past 42 years. Moreover, our time-varying index sheds further insights on the extent to which rent and tenure security laws have converged over the past forty years for each economies. Finally, using our new panel data on private tenancy regulation index for 18 economies, we show three empirical results. First, very strict rent control regimes do lead to lower real rent growth rates than regimes with free rents. Second, tenure security law plays a statistically significant role for the effects of second-generation rent control regimes on rents: soft rent control regimes with time limited tenure security and minimum duration periods may cause higher rent growth rates than free rent regimes. Third, the rent free regimes do not show significant high real rent appreciation rates. Instead, the rent data reveals that the mean real rent growth is statistically not different than zero for the free rent regimes.

- *JEL Classification:* C43, O18, R38.
- *Keywords:* time-varying rent regulation indices, rent control law, tenure security law, first - and second generation rent control regimes.

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1 Introduction

Recent public and political interests on rent control, for example, in the U.S. and Germany¹ are motivated in no small part by recent economic events such as the Financial and Housing cycles (the Great Recession) and the Brexit. While this burgeoning recent public interest on rent control continues to be debated by political factions and consumers, the general academic consensus on the issue is clear: rent and eviction controls foster economic inefficiencies (e.g. Hayek (1972) and Friedman and Stigler (1972)). Rent control often leads to lower housing quality, less new constructions, shrinking rental markets, misallocations of living space or harmful immobility of labour and thus to insufficient distribution of labour throughout the economy.² One of the reasons for the continuous public debate, despite the economic theory, is due to various empirical results that support both sides of the issue and the lack of comprehensive empirical analysis that is based on a solid rent regulation data for the across regions and nations (see for example, Arnott (1995) and Hubert (2003)). As a consequence, in the last thirty years, there are very few studies on the effects of rent control that is based on a large time-variant cross-country rent regulation index.³

The objective of this paper is, consequently, twofold: first, to construct and analyze a country-specific time-varying private rent regulation index for 18 developed economies⁴ starting from 1973 till 2014; second, to analyze the effects of our panel rental regulation index on the housing rental markets across 18 economies. Unlike the previous rent regulation indices in the literature, our index, which is based on the detailed country (state) reports, not only covers 18 developed economies over 42 years but also combines both tenure security and rent laws.⁵ Our index covers

¹ In Germany, the so-called Mietpreisbremse was introduced in 2015 with the aim of barring landlords in property hotspots from increasing rents by more than 10% above a local benchmark. And in the U.S., a recent as 2017, New York City council panel approved rent increase for the regulated apartments (New York Time, 2017)

² Along with the seminal works by Hayek (1972) and Friedman and Stigler (1972), there are other well established works by, for example, Olsen (1969), Gyourko and Linneman (1990), Basu and Emerson (2000), and Munch and Svarer (2002).

³ See, for example, Gstach (2010), Malpezzi and Ball (1993), Andrews et al. (2011), and Cuerpo et al. (2014))

⁴ Due to the data availability, we use both the country and the state level data in constructing our regulation index. The countries and states are New South Wales (Australia), Austria, Ontario (Canada), Denmark, United Kingdom, Finland, France, Germany, Ireland, Italy, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, California (United States), Massachusetts (United States).

⁵ Using exactly the same framework and methodology as Weber (2017), Kholodilin (2018) is the only other regulation index that extends Weber (2017) regulation index to include more countries and longer time periods.

the classic aspects of first- and second-generation rent control and helps to identify three different phases of rental market regulation for the past 42 years. Moreover, our time-varying index sheds further insights on the extent to which rent and tenure security laws have converged over the past forty years for each countries. Finally, using our new panel data on private tenancy regulation index for 18 economies, we show three empirical results. First, very strict rent control regimes do lead to lower real rent growth rates than regimes with free rents. Second, tenure security law plays a statistically significant role for the effects of second-generation rent control regimes on rents: soft rent control regimes with time limited tenure security and minimum duration periods may cause higher rent growth rates than free rent regimes. Third, the rent free regimes do not show significant high real rent appreciation rates. Instead, the rent data reveals that the mean real rent growth is statistically not different than zero for the free rent regimes.

The paper is structured as follows: it has two main sections. First section is on the measure of our private rental market regulation index. In this section, we provide a short overview of the recent economic literature on rental market regulation in different countries. We then describe in detail the methodology in constructing our rental market regulation index and its two sub-indices. Finally, we provide and analyze the time series properties of rent and tenure security laws. In section two, we empirically analyze the effects of different rent control regimes such as the first-generation rent control and second-generation rent control regimes (Arnott 1995), using our regulation index, on the development of real rents. Last section concludes with the Appendix that contains each country regulation report in detail as well as other robust empirical tests.

2 On the Measure of Rental Market Regulation

This section deals with the country-specific regulation of private tenancies in 18 advanced economies over the course of 42 years. On the basis of detailed country reports, we construct time-varying rental market regulation index. The index is based on both rent laws and tenure security laws

that cover the classic aspects of first- and second-generation rent control.

On the basis of 18 regulation reports⁶, a set of ten dummies and three indices is constructed. The panel gives a deep and broad overview of private tenancy law in advanced economies. Regulation that deal solely with public housing are, however, not considered here. The dataset enables a thorough analysis of different regulation outcomes across the sample. Our time-variant cross-country indices differ from others as most studies on private rental markets are based on single-country levels.

2.1 Literature Review

Content and methodology of the private rental market regulation index follow the literature in two separate fields. On the one hand, the recent literature on the different styles of rental market regulation - especially rent control and tenure security - provide the basis for the content of the index (Arnott 1995, 2003; Lind 2001; Hubert 1996). The number of studies about tenure security is slim in comparison to the one addressing rent regulation. However, the presence of a certain level of tenure security is essential for rent regulation to be effective (Arnott 1995, 2003; Lind 2001). Understandably, renters cherish a secure and familiar home (Arnott 1995). Therefore, loose tenure security would put a negative effect on the value of rental dwellings, especially as a substitute to home ownership. Whitehead et al. (2012) and Scanlon et al. (2011) state that tenure security plays a significant role for rental market regulation. Whitehead et al. (2012) find that countries with a regulation that balances the interest of both landlords and tenants may help developing bigger and better functioning rental markets. Scanlon et al. (2011) state that two main factors responsible for a more attractive private rental market are a level of tenure security and a country specific tradition towards renting rather than owning. Haffner et al. (2008) draw similar conclusions by comparing the rental market regulation of five European countries. Boer and Bitteti (2014) compare the private rental sector of four European countries. The regulation

⁶ Country reports are presented in the Appendix.

of rents and the extent of tenure security are part of the study. They conclude that there is a growing importance of the private rental sector policies for the outcome of housing markets and therefore for the whole economy. Furthermore, two big research projects in the field of international law by the European University in Florence (Schmid 2009) and the University of Bremen⁷ give detailed snapshots of private tenancy regulation in Europe. However, both projects remain solely descriptive.

Andrews et al. (2011) are the first to construct a broader indexation of rent regulation and tenure security. Their time-invariant index consists of questionnaire of country experts and is a snapshot of the regulation in 32 OECD countries. The index is divided into two areas: the security of tenure and the regulation of rents. The two areas consist of five sub-indices that cover rent level control, rent increase control, deposit requirements, ease of tenant eviction and tenure security. The authors show that tighter control comes together with lower homeownership rates and a lower quality of rentals. The European Commission adopted the index for their own analysis (Cuerpo et al. 2014) and adapted it for all members of the European Union. Their analysis showed, among others, that tighter rent regulation can lead to stronger house price dynamics. Furthermore, Kholidin (2015) constructed an index of housing market regulation for Germany between 1913 and 2015.

Both the present and the past have seen many different regimes of rent and eviction control. Thus, a clear classification of different rent control and tenure security regimes may help to find an adequate assessment of private tenancy regulation. One of the main contributions to the classification of rent control regimes is done by Arnott (1995, 2003) who classifies rent control as first- and second-generation rent control regimes. According to Arnott (1995, 2003), first-generation rent control regimes are the strictest form of rent control such as nominal rent freezing. Second-generation rent control regimes imply a softer rent control. These regimes usually allow rents to be adjusted with consumer or cost price developments. A further form of second-generation rent

⁷ <http://www.tenlaw.uni-bremen.de/introduction.html>

control regimes is known as tenancy rent control regimes. These regimes decontrol initial rents while rent increases during the tenancy are bound to some sort of control. The classifications defined by Arnott (1995, 2003) are mainly used for the indexation of rent control. Lind (2001) and Hubert (2003) also present some variations of these classifications of rent control.

As far as the methodology of indexing is concerned, we follow the well-known legal origin theory (La Porta et al. 1998 and 2008). For large country samples, the authors of the legal origin theory extracted the regulation of different markets and sub-markets such as finance (La Porta et al. 1998), labour markets (Botero et al. 2004) or private credit markets (Djankov et al. 2007).

In the past twenty years legal origins theory and criticisms (Deakin et al. 2007) thereof contributed to uncovering the drivers and effects of different institutional outcomes throughout the world. The legal origins theory was initially promoted by La Porta et al. (1998 and 2008). According to this theory, the origins of legal systems such as the English common law⁸ and the civil law in its French, German and Nordic variants influence national regulatory styles. The legal origins theory is used in the field of company and financial law (La Porta et al. 1998) as well as to other markets such as labour markets (Botero et al. 2004), the regulation of private credit markets (Djankov et al. 2007) or the burden of entry regulation (Djankov et al. 2002b) to mention just a few. The legal origins theory predicts that civil law countries are associated with a stricter regulation and a deeper government involvement than common law. Furthermore, the approach claims that common law countries are more likely to produce efficient rules for the governance of the business enterprise than countries with civil law origins (La Porta et al. 2008).

2.2 Methodology: Measuring rental Market Regulation

The dataset of this paper follows the leximetric approach. The construction of the rent law index, the security of tenure index and the rental market regulation index follows the methodology that is commonly used in legal origins studies. The empirical base for the legal origins approach are

⁸ Please note that English legal origin are named common law throughout this paper.

multi-country datasets which measure the degree of regulation in particular areas of economic activity. The coding procedures follow leximetric analyses that are a diligent quantification of legal rules (Lele and Siems (2006), Deakin et al. (2007), and La Porta et al. (1998)). In other words, the regulating strength of laws is measured by numerical value to the law in a particular field.

The dataset deals with two broad areas: rent law (rl) and tenure security law (tsl). Both areas together represent the rental market regulation (rmr) index. The rmr index is the average of ten dummies dealing with the legal statutes governing private tenancy contracts. They are described in more detail further below. Each of the two areas of regulation form an index that measures rent control or tenure security. The two indices are the average of their dummies. While the rent law index consists of the first six dummies (D1-D6), the tenure security index is the average of the last four dummies (D7-D10). The dummy variables have two outcomes, 'yes' and 'no' or '1' and '0', respectively. Therefore, the indices range between zero and one. An overview of the dummies is given in Table1.

The indexation of law and regulation will always give an incomplete picture of reality (Deakin et al. 2007). Therefore, the effort is to approach it as closely as possible. Due to simplicity and transparency reasons, however, the rental market regulation index cannot take every critical aspect into account. For example, different regulations that are tracked by the ten dummies may vary in relevance across the countries, depending on the different roles they play in each system. Therefore, not weighting every single variable of the index individually may cause a problem (Deakin et al. 2007). The rental market regulation indices neglect this aspect since there is no special weighting of the different dummies. This means that the three indices are the average of their respective dummies.

Higher index values correspond to a more severe legal protection of tenants against rent movements and unwanted evictions. That is, the higher each index the higher the level of regulation of private tenancies. At this point, the longitudinal rental market regulation index follows the

Table 1: The Rental Market Regulation Index

Variable	Description
<i>Rent laws</i>	
D1: Real rent freeze	The dummy equals one if landlords may not increase rents by more than the growth of official cost or price indices.
D2: Nominal rent freeze	The dummy equals one if rents are determined solely by the government or another institution.
D3: Rent level control	The dummy equals one if landlords may not charge rents above a certain rent level.
D4: Intertenant decontrol	The dummy equals one if rent control holds at the beginning and during the tenancy.
D5: Other specific rent decontrol	The dummy equals one if certain kind of dwellings are not de-controlled such as new constructions, vacant dwellings or luxurious housing.
D6: Specific rent recontrol	The dummy equals one if certain kind of dwellings fall under a stricter rent regime.
RL: Rent laws index	Measures the overall degree of rent control for new and sitting tenants as the average of D1 to D6.
<i>Tenure security laws</i>	
D7: Eviction protection during term or period	The dummy equals one if only reasonable reasons leads to a warranted eviction during the term or rent payment period.
D8: Eviction protection at the end of term or period	The dummy equals one if only reasonable reasons leads to a warranted eviction at the end of term or rent payment period.
D9: Minimum duration	The dummy equals one if a minimum duration period of more than two years is compulsory for every private tenancy.
D10: Short-term tenancies	The dummy equals one if short-term tenancies that are tenancies up to a year are not allowed.
TSL: Tenure security laws index	Measures the degree of security of tenure as the average of D7 to D10.

mentioned approaches of the leximetric literature (Deakin et al. 2007; Botero et al. 2004; La Porta et al. 1998; La Porta et al. 2008). This approach implies that laws regulating private tenancies limit the formal freedom of landlords and the whole market. However, the abundance of such rules enhances the freedom of contract.

Yet the regulation of tenancies does not solely redirect resources from landlords to renters; tenancy law rules may also serve an efficiency aspect as Deakin (2007) argues in the case of labour market regulation. For private tenancies, rules of tenure security and rents may provide insurance against the risks of eviction of the tenant or rising rents. Rules can also compensate for informational asymmetries (Stiglitz 2000) and further inefficiencies that arises due to other uncertainties. Therefore, both a maximum and a minimum score may not be automatically optimal for renters in the end, given the possible inefficiencies (Basu, Emerson 2000, 2003; Arnott 1995) and the mentioned asymmetries it provokes.

In contrast to most of the datasets of legal origin approaches the dataset constructed here is of longitudinal nature (Deakin et al. 2007). That means the panel is not only cross-sectional but also time-variant. This allows a much deeper analysis of the development and distribution of private tenancies regulation (Deakin et al. 2007). Furthermore, the structure allows us to use each dummy separately for further empirical or theoretical work. This holds true especially for more qualitative analysis such as the analysis of special combinations or single regulation outcomes.

The here constructed indices measure formal legal rules. According to Botero et al. (2004) the following two concerns can be made: First, the enforcement of rules may vary over the sample. However, the quality of enforcement cannot be measured directly. But we can get a rough estimate of the enforcement quality. In the case of private tenancy markets the court formalism index for eviction of tenants in the event of outstanding rent payments may be such an control variable (Djankov et al. 2003). In any case, despite the critique that formal legal rules do not fully matter, an extensive literature shows that formal rules do matter a lot (La Porta et al. 1998; Djankov et al. 2003; Botero et al. 2004; Djankov et al. 2007; Djankov et al. 2008). Second, the focus

on formal rules is misleading because formally distinct legal systems can and do achieve the same functional outcome as common law systems, only by different means. However, this criticism is not convincing, because rental market law is statutory in every country. Even in common law countries deviations are exceptions and not the rule (Botero et al. 2004).

The indices consider standard contracts and their exemptions. If there are two equitable rent control methods, the more liberal one has been observed. The idea is that lawful tenancy contracts would usually shift to the more liberal version since tenants are generally in a weaker position before the rental contract is signed. Nevertheless, regulatory exceptions such as new construction deregulations or spatial reregulations are taken into account by the index.

This work examines private rental market regulation from 1973 to 2014 on a yearly basis. In order to codify the necessary information, a range of sources was used. First, major reforms were identified by using secondary literature on rental market regulation such as the large accumulation of country reports of the two broad research projects in law by the Florence University and the University of Bremen that were finished in 2005 and 2013, respectively. Second, the identified major reforms were analysed in detail in the mentioned areas covered by rent law and tenure security law. Mainly primary sources such as legal texts were acquired via national law databases or direct requests to the ministry or different tenant and landlord associations. Finally, the qualitatively surveyed tenancy law data was cross-checked with large country surveys like e.g. Whitehead et al. (2012) and Scanlon et al. (2011) or single country reports such as Miron (1995) for Canada Ontario, Satsangi (1998) for France or Jóhannsson (1998) for Finland and Sweden to mention just a few. Interviews or surveys were not used as sources like it was done by the OECD (Andrews et al. 2011) or the Wharton Residential Land Use Regulation Index (Gyourko et al. 2008).

We outline in detail on the rent laws - and tenure security laws indices below.

2.2.1 Rent Laws

Rent laws are the framework for the determination of rents. Both the fixing of rents at the beginning of a tenancy and its development during the term are directly affected by rent law. However, rent law may also allow exemptions from rent control, e.g. for special contract and dwelling types. Considering the complex structure of rent control laws six dummies capture the most important aspects of rent regulation within a country. The composition of the dummies follows the standard classifications given by Arnott (1995, 2003) and Lind (2001). Hence the rent law index considers first- and second-generation rent control. The six dummies are: (i) real rent freeze, (ii) nominal rent freeze, (iii) rent level control, (iv) intertenancy decontrol, (v) other specific decontrols, and (vi) specific rent recontrol. The first three dummies measure direct rent controls for standard tenancies. The latter three dummies check for exemptions.

Dummy D1 checks whether landlords can raise rents by more than index linked prices or costs per year. Price indices are meant to represent any official consumer or any other official price index. Cost indices stand for official construction cost indices or official mortgage cost benchmarks or indexed housing costs. Dummy D1 turns one if rents cannot grow by more than a cost or price index per year. Dummy D2 deals with a nominal rent freeze. This dummy checks whether rents may not be updated at all or just at a rate that is defined by governments or institutions erratically. Nowadays, this kind of very strict rent regulation is rarely observed in advanced economies. It was not unusual between 1950s and the 1970s in several countries, however. The dummy turns one if rents may not be updated by more than the official fixed rate. This does not exclude the unusual case of the official fixed rate may turn out to be higher than the consumer or cost price index for a special year. Dummy D3 deals with qualitative rent ceilings. There exist several different types of upper rent limits. These ceilings may look like a quality based comparative rent as they are currently used in the Netherlands, a reference rent level as defined in Germany or Sweden, and a so-called fair rent level as was the case in New South Wales or England.

The first three mentioned dummies equal one in case of a very strict rent control regime. Yet there can be rent regulations that have a real rent freeze but not a certain qualitative rent level that may not be exceeded and vice versa. In the former Spanish tenancy law, in comparison, rents were not allowed to be increased by more than the official consumer price index but an upper ceiling for rents did not officially exist.

The remaining three dummies check for exemptions of the current rent regulation system. In reality, many countries have passed laws that limit existing rent controls. The index checks for the four most common ways of deregulation. Therefore, the fourth dummy D4 checks whether rents are not regulated between different tenancies. It is meant to find out about so-called deregulation-reregulation types where the deregulation just refers to the initial rents of new contracts. After the initial rent was set freely or at the common market level the tenancy is recontrolled again. In some Californian cities this kind of deregulation has been used for new constructed dwellings, for example. Arnott (2003) and Lind (2001) also distinguishes between regulation types where rents are controlled for all tenants or just for staying tenants. The dummy turns one if initial rents of tenancies are regulated.

The fifth dummy D5 checks for decontrol of special dwelling types or in certain areas. The most common method here is the deregulation of newly built dwellings. It has been an often used method to enhance investments in rental housing. This kind of deregulation has recently been in use in Denmark and other countries. Other forms of full decontrol are vacancy decontrol or rent level decontrol. Vacancy decontrol can be manifold. Here, vacancy decontrol includes both dwellings that have to be vacant for a longer period and for all rentals in a certain area if the local vacancy rate has risen above a certain level (Lind 2001). Another form may be a full liberalisation of high-end dwellings. That is, rentals become decontrolled if the rents reach a predetermined rent level or the apartments reach a certain amount of quality level. Currently such a system is in use in the Netherlands where rentals with a certain high rent level are free from rent control.

The dummy turns one if there is no form of decontrol whatsoever.⁹

However, tenancy law may offer the possibility for special dwellings or areas to be controlled stricter. This case is examined by the Dummy D6. The most recent example for such stricter rent control is Germany where rent increases may be restricted in special regions in case there is a serious shortage of free rentals. In Switzerland such spatially enhanced rent control existed also in the 1970s and 1980s. Usually, this kind of exemptions from standard rent controls is not widespread.

2.2.2 Tenure security laws

The tenure security laws address the tenants' protection against eviction and the landlords' rights to repossess their property respectively. Furthermore, legal rules about the duration of tenancies may also play a significant role for landlords and tenants (Arnott 1995). Therefore, the tenure security laws index is the average of four dummies which are: (vii) eviction protection during term or period, (viii) eviction protection at the end of the term or period, (ix) compulsory minimum duration, and (x) the treatment of short-term tenancies.

The dummies D7 and D8 check whether landlords need reasonable reasons in order to evict a tenant or whether they are not bound to any restriction if wanting to evict the tenant. Reasonable reasons are breaches of contract like non-payment of rents, harassment and endangerment of neighbours or damages to the rented dwelling by the tenant. Furthermore, landlords could have reasonable reasons for repossession that are predefined by law, such as own personal needs, sale or restoration and reconstructions.¹⁰ These reasonable reasons have to be defined by law. The dummies D7 and D8 differ in their time-reference. While D7 checks for eviction protection during the term or period of the tenancy, the other dummy do so for tenancies at the end of the term or

⁹ Please note that dummy D5 automatically turns one if a free rent regime is in power and dummy D6 automatically turns one in case of full rent regulation.

¹⁰ Own personal needs mean that not only the landlord but also spouses and near relatives may live in the rental. Restoration is defined as the necessity of a complete restoration. These kinds of mechanisms may be chosen by landlords who plan to enhance the quality of the building in order to attain higher future rent payments. Finally, selling a vacant dwelling as opposed to a rented one might be attractive for landlords at the expense of tenants since unleased dwellings generally obtain much higher prices.

period of payments. Usually, the latter comes up if time limited contracts or minimum duration periods for tenancies end.

This differentiation is necessary since eviction protection often distinguish between these two stages. There are several countries where landlords may call for eviction at the end of the agreed term without the need of giving any reasons while during the term tenants enjoy full protection. In England, Assured Shorthold tenancies may be finished by the landlord without any reason at the end of the term or at the end of a payment period of a periodical tenancy. Since landlords may favour short contracts due to flexibility reasons in the case of information asymmetries (Basu, Emerson 2000, 2003), tenants face high uncertainty as far as the duration of their private tenancies is concerned. As a consequence, in countries where fixed term tenancies end automatically the duration of private tenancies can shrink substantially to very short periods. This effect has appeared, for example, in the USA where 97.7 percent of all tenancies last one year or less (Genesove 2003). In Great Britain, the median length of tenancies is around two years according to the Office for National Statistics (2011). In Germany, however, tenants enjoy eviction protection both during and at the end of the short-term or payment period. Limited tenancies do not end automatically and evictions are bound to special reasons like personal needs or future restoration plans. As a consequence, tenancies in Germany last longer. Therefore, a typical tenancy lasts around six years (Fuchs, Fitzenberger 2013).

The dummies D9 and D10 primarily deal with duration rules. The ninth dummy of the tenure security laws index checks for a compulsory minimum duration term of more than two years. In some European countries those kinds of tenancy length regulations are in practice. For example, in Spain, France or Italy private tenancies have to last for a minimum duration period of more than two years. During that time tenants usually enjoy higher tenure security and rents are controlled stricter. As for Spain, during the compulsory minimum duration period landlords may evict tenants only for heavy contract breaches. After the initial five or eight years landlords in Spain may evict tenants also due to personal needs. Mora Sanguinetti (2010) discusses

minimum duration periods and shows, using Basu and Emerson's approach (2000), that these form of regulation can lead to a shrinkage of rental markets and higher rents.

The dummy D10 addresses short-term tenancies. Short-term tenancies are defined as tenancies that are limited in time. The time limitation may go down to less than a year. Tenancies that are limited in time but have a minimum duration are not treated as short-term tenancies. The dummy checks whether short-term tenancies are forbidden by law. In England, New Zealand or US-states like Massachusetts short-term contracts are the most common form of renting. However, in Austria short-term contracts are not allowed. Here, only time limited tenancies are allowed that have to last at least three years with a considerably lower rent level. The dummy turns 1 if classical short-term tenancies are forbidden by law.

2.3 Data and Index Properties

Indexing the information about rent laws and tenure security laws for each country or state and each year gives us a unique time-variant index of private rental market regulation for 18 advanced economies for a time period of 42 years starting in 1973. Sometimes rental market laws are made on a regional level, for example in the USA, Australia or Canada. When this is the case, special states are used as a proxy for the whole country. Over the examined time period, the regulation of rentals has changed significantly in the majority of countries. The following Figures 1-3 and Tables 2-3 show the development of rent laws, tenure security laws and rental market regulation as the composition of all dummies. For the mentioned period, roughly 37 relevant reforms of rental market regulation have been identified in the sample. The index signals 28 reforms of deregulations and 9 reforms that enhancing regulation. According to the dataset, the majority of reforms took place in the last century peaking in the 1980s and 1990s.¹¹

¹¹ AUS_NSW=Australia=New South Wales, CAN_ONT= Ontario, USA_MA=Massachusetts, USA_CA=California

2.3.1 Data

The data shows remarkable changes of rental market regulation across countries and over time. Three different phases of regulation can be identified. The first phase is located in the 1970s. It is a time of reregulation in the form of first- and second-generation rent control re-gimes. For the 1970s the rental market regulation index outlines an increase in regulation. During that time period, a broad reregulation - not only in private rental markets but also in labour and other markets - took place in western countries. Just two decades before the 1970s, first-generation rent control regimes that had been installed during wartime were abandoned or phased out in many countries (Hubert 2003). As a consequence, the picture is very diverse across countries: In several European countries, first-generation rent control regimes stayed more or less unchanged until the 1980s. This holds true for example for Spain, England or Finland. On the other hand, countries like France installed more powerful first-generation rent control regimes in the 1970s. The development of rent control regimes is somewhat different in Northern America in the 1970s. There, merely second-generation rent control regimes emerged in parts of several states that had been completely deregulated before, such as in Massachusetts or California. In Ontario the development was similar to those in the USA (Arnott 1995).

The second phase is characterized by a broad trend of deregulation. In the last two decades of the twentieth century many countries experienced a phase of severe deregulation. In some countries the deregulation provoked several reactions of reregulation like in France in 1989 or Spain in 1994. During that period, the vast majority of western European countries changed its rent control regime to a less strict one, such as second-generation or even free rent regimes. Large changes occurred e.g. in England and Finland. In these countries, rent control regimes were adopted with very lax or even no rent control combined with very weak tenure security. In California or Massachusetts, the trend of rent regulation phased out in the 1990s. In Massachusetts, rent control was fully abandoned in 1995. In California, however, several cities still use some form

of rent and eviction control. However, the controlled sections of the Californian rental housing markets significantly diminished in the past thirty years. In Canada, the regulation of private tenancies was also steadily liberalised since the 1990s.

The third phase is characterized by a tremendous housing market turmoil. The phase started with the beginning of the new millennium. In the first years of the new decade the price for houses rose tremendously in many countries of the panel. Ownership markets experienced a strong boom. At the end of the first decade the upswing of the house prices was followed by a hurtful downturn of house prices and housing market activity in many advanced countries of the panel. The harmful boom and bust cycles in several advanced economies gave impetus to the interest in housing market regulation such as rent and eviction control. An unambiguous and uniform direction of rental market regulation, however, did not occur in these years. On the one hand, Ireland and Germany installed stricter regulations of private tenancies in the footsteps of a housing market boom.¹² It is noticeable that the Irish tightening of rental market policy in 2004 was significantly larger than the one in Germany in 2015. On the other hand, the financial market crisis and the European debt crisis in the wake of the burst of the great housing market meltdown facilitated sharp rental market deregulations in countries that were received international funding due to their difficult economic situation. Under these circumstances the two Eurozone member states Spain and Portugal¹³ underwent a tremendous deregulation that replaced second-generation rent control by fully liberalized rent determination.

2.3.2 Convergence over time

In the past 42 years the regulation of private rentals followed the broad trends sketched above. From the year 1980 onwards, both rent and tenure security laws experienced a process of net liberalisation. However, the process of rent control liberalisation was much deeper and more

¹² The stricter rules for Germany are not illustrated by the figures since the indices end in 2014. However, the stricter rent control law in Germany would have turned D6 from zero to one.

¹³ Portugal, however, is not part of the our time-variant country panel.

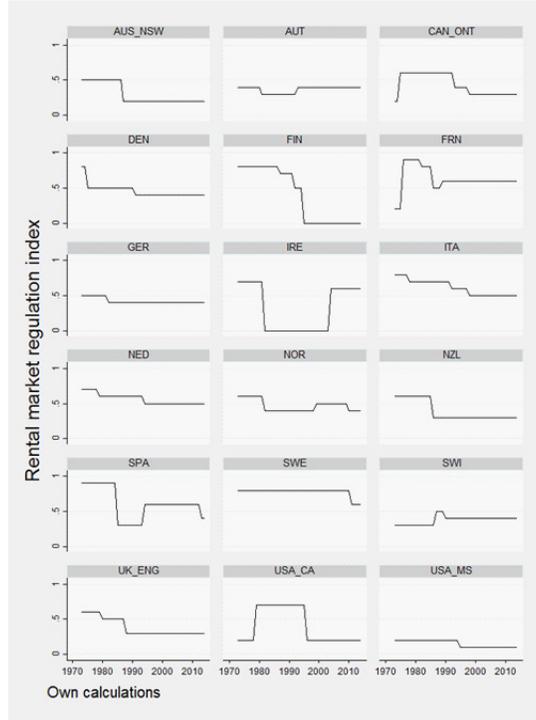


Figure 1: Rental Market Regulation Index

evenly distributed than for tenure security. As table 2.2 shows, the mean of the rent control laws index has fallen from 0.57 in 1980 to 0.28 in 2014. In the same time, the tenure security laws index has declined from 0.64 to 0.50. Furthermore, the cross-country standard deviations of the rent laws index became significantly lower than the cross-country standard deviations of tenure security laws index. While the standard deviation of rent control has fallen from 0.28 in 1973 to 0.18 in 2014, the deviation of tenure security laws has risen from 0.21 in 1973 to 0.31 in 2014. In other words, the regulation of rents converged over the whole country panel while tenure security laws have diverged.

According to the legal origin theory (La Porta et al. 2008) the legal tradition is time-invariant predictor of the level of regulation in a country. The authors of legal origin theory showed in numerous studies that regulation in common law countries is generally lower than in countries with a French, Scandinavian or German legal origin (La Porta et al. 1998; Djankov et al. 2002b,

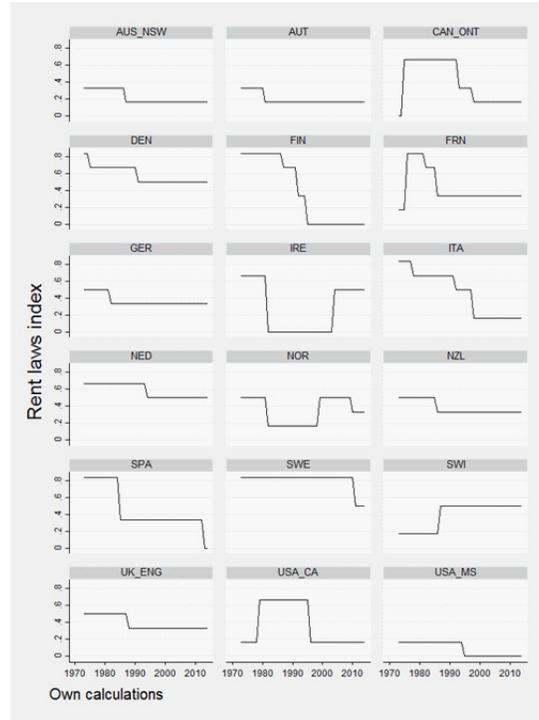


Figure 2: Rent Laws Index

2003; Botero et al. 2004; Djankov et al. 2007). The theory implies that legal origin is the strongest predictor of the diversity of regulation intensities and governmental market interventions. Djankov et al. (Djankov et al. 2007) show that there is no significant convergence of creditor rights or creditor information systems among legal origin over time. In contrast, the convergence theory predicts that regulation converge among countries towards the more successful one. Thus, it contradicts the legal origin theory (Djankov et al. 2007). However, Lele and Siems (2006) show that shareholder protection has converged over time irrespective its legal origin. As far as rent control laws are considered, Whitehead et al. (2012) show a process of broad convergence towards more liberalised markets for a small panel of European countries by comparing rental market regulation in 1980 and 2010.

The time-variant country sample¹⁴ support both the legal origin and the convergence theory.¹⁵

¹⁴ There are 7 common law countries, 4 French legal origin countries, 3 German legal origin and 4 Scandinavian legal origin countries in the sample.

¹⁵ Please note that this is a purely descriptive analysis. For a more robust conclusion a more analytical analysis

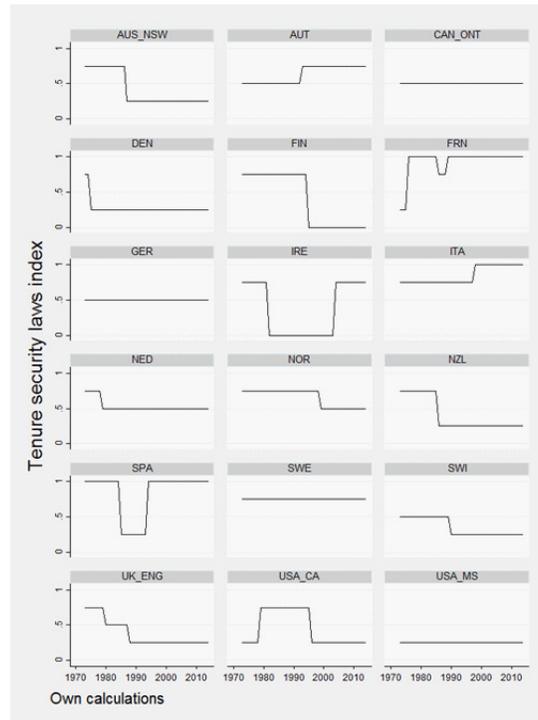


Figure 3: Tenure Security Laws Index

Looking at the development of private rental market regulation for the various legal origins shows clear differences. With respect to the regulation of rents there is a convergence among the different legal origins, especially for common, French and Scandinavian legal origin countries that converged considerably towards lower levels. Tables 2 and 3 show that rent control has been relaxed on average in common law, French law and Scandinavian law countries but not in German law countries where rent laws index remained more or less unchanged on an already lower average of 0.33 or below. This means that rent control laws are on average more homogenously distributed over the groups of different legal origins. As far as tenure security laws are concerned, the data shows a downward trend in the average level of regulation only for Scandinavian legal origin and common law countries. The level of tenure security in French legal origin countries, in contrast, follows an upward trend. German legal origin countries, in turn, show on average a very robust

would be needed.

score of tenure security over time of 0.50. Hence, both legal origins did not converge toward lower levels. This can be interpreted as evidence for the legal origin theory that predicts that countries stick to certain regulatory styles according to their legal origin. However, the convergence of rent control laws between all legal origins and tenure security laws between Scandinavian and common law countries support the theory of a transnational harmonisation of regulation.

The broader legal convergence of rent control laws was part of broad liberalization trends that started in common law countries and were then adapted by Scandinavian and French legal origin countries. Reasons for these convergences could be a more and more globally harmonized view on the ‘right policy’ on housing markets or a higher impact of certain school of thoughts. As mentioned before, there is a broad consensus among economists that rent control generally harms housing markets. However, the picture is different for tenure security laws. Here the convergence can be detected only between Scandinavian and common law countries. The lesser connection in patterns of regulation in this field may be due to the fact that tenure security is less popular discussed in academia and politics since it is was not seen as a classical intervention in the market price mechanism. The convergence of Scandinavian legal origin countries towards common law countries, however, may be due to a closer connection between Scandinavia and Anglo-Saxon world in the past decades.

Table 2: The Rental Market Regulation Index Over Time

	Rent laws index	Tenure security laws index mean	Rent laws index	Tenure security laws index standard deviation
1973	0.49	0.63	0.28	0.21
1974	0.49	0.63	0.28	0.21
1975	0.52	0.60	0.25	0.23
1976	0.56	0.64	0.24	0.23
1977	0.56	0.64	0.24	0.23
1978	0.55	0.64	0.23	0.23
1979	0.57	0.65	0.22	0.21
1980	0.57	0.64	0.22	0.21
1981	0.56	0.64	0.23	0.21
1982	0.49	0.60	0.27	0.26
1983	0.49	0.60	0.27	0.26
1984	0.49	0.60	0.27	0.26
1985	0.46	0.56	0.26	0.25
1986	0.44	0.51	0.26	0.23
1987	0.44	0.49	0.24	0.23
1988	0.43	0.47	0.24	0.24
1989	0.43	0.49	0.24	0.26
1990	0.43	0.47	0.24	0.27
1991	0.42	0.47	0.24	0.27
1992	0.39	0.47	0.22	0.27
1993	0.37	0.49	0.21	0.28
1994	0.36	0.53	0.20	0.30
1995	0.33	0.49	0.23	0.31
1996	0.31	0.46	0.22	0.31
1997	0.31	0.46	0.22	0.31
1998	0.28	0.47	0.21	0.33
1999	0.30	0.46	0.22	0.32
2000	0.30	0.46	0.22	0.32
2001	0.30	0.46	0.22	0.32
2002	0.30	0.46	0.22	0.32
2003	0.30	0.46	0.22	0.32
2004	0.32	0.50	0.21	0.31
2005	0.32	0.50	0.21	0.31
2006	0.32	0.50	0.21	0.31
2007	0.32	0.50	0.21	0.31
2008	0.32	0.50	0.21	0.31
2009	0.32	0.50	0.21	0.31
2010	0.31	0.50	0.21	0.31
2011	0.30	0.50	0.17	0.31
2012	0.30	0.50	0.17	0.31
2013	0.28	0.50	0.18	0.31
2014	0.28	0.50	0.18	0.31

Table 3: The Rental Market Regulation Index Over Time by Legal Origin'

	Rent laws index	Tenure security laws index	Rent laws index	Tenure security laws index
	mean		standard deviation	
Data by legal origin group means				
Common law				
1974	0.33	0.57	0.24	0.24
1984	0.40	0.50	0.25	0.29
1994	0.29	0.32	0.21	0.24
2004	0.24	0.36	0.16	0.20
2014	0.24	0.36	0.16	0.20
French legal origin				
1974	0.63	0.69	0.32	0.31
1984	0.71	0.81	0.08	0.24
1994	0.42	0.81	0.10	0.24
2004	0.33	0.88	0.14	0.25
2014	0.25	0.88	0.22	0.25
German legal origin				
1974	0.33	0.50	0.17	0.00
1984	0.22	0.50	0.10	0.00
1994	0.33	0.50	0.17	0.25
2004	0.33	0.50	0.17	0.25
2014	0.33	0.50	0.17	0.25
Scandinavian legal origin				
1974	0.75	0.75	0.17	0.00
1984	0.63	0.63	0.32	0.25
1994	0.46	0.63	0.28	0.25
2004	0.46	0.38	0.34	0.32
2014	0.33	0.38	0.24	0.32

3 Effects of Private Regulation Index on Rents

Using a new panel with data on private tenancy regulation in 18 advanced economies, this section quantitatively analyze the effects of our regulation index on housing rents. The analysis will focus on the effects of first-generation rent control regimes, second-generation rent control regimes and free rent regimes on the behaviour of real rents. Since there is a great variety of regulation types within the group of second-generation rent control regimes the effects may vary from type to type. Therefore, these regimes will be evaluated in more detail and largely independently of the experience with first-generation controls and rent free regimes. The differentiation will be made along the different levels of tenure security.

Our empirical analysis mostly verifies the theory on rent control. Our main empirical results can be summarized as follows: First, very strict rent control regimes do provoke lower real rent growth rates than regimes with free rents. Second, tenure security plays a significant role for the effects of second-generation rent control regimes on rents. The analysis shows that soft rent control regimes with time limited tenure security and minimum duration periods may cause higher rent growth rates than free rent regimes. Lastly, the rent free regimes do not show significant high real rent appreciation rates. Instead, the rent data reveals that the mean real rent growth is statistically not different than zero for the free rent regimes.

As we strictly focus on three different rent control regimes, first -, second generation and free rent regimes, we briefly elaborate on the theory behind the first and second generation rent control regimes before our empirical analysis below. The standard textbook model of the first generation rent control is where the rent is pre-set below the market rent, consequently the rent control regimes creating an excess demand on the rental market. Unlike the first generation rent control regime, the second generation regime covers all soft rent control regimes including tenancy rent control regimes

We base our empirical analysis on the model framework by Basu and Emerson (2000) and its

Table 4: Descriptions of Variables and Rent Control Regimes'
Variables and Sources

Variables	Source
Nominal Rents	Australian Bureau of Statistics (Sydney), Statistics Austria, Statistics Canada (Toronto), FRED (Boston, Los Angeles), OECD (all other countries)
Consumer price inflation	Australian Bureau of Statistics (Sydney), Statistics Canada (Toronto), FRED (Boston, Los Angeles, Denmark, France, UK), Thomson Reuters Datastream (all other countries)
GDP per Capita	World Bank (WDI database), in US Dollar (real)
Nominal House Prices	Stapledon (2007) & Australian Bureau of Statistics (Sydney), Statistics Austria (Vienna, Austria), Statistics Canada (Toronto), FRED (Massachusetts, California)
Population	World Bank (WDI database)
first generation rent control regime	Dummy variable that turns 1 if $D2 = 1$; see section 2 for more information
second generation rent control regime A	Dummy variable that turns 1 if $D1$ and/or $D3=1$, $D2=0$, $D7=1$, $D8=1$, $D9$ and/or $D10=1$
second generation rent control regime B	Dummy variable that turns 1 if $D1$ and/or $D3=1$, $D2=0$, $D7=1$, $D8=0$, $D9$ and/or $D10=1$
second generation rent control regime C	Dummy variable that turns 1 if $D1$ and/or $D3=1$, $D2=0$, $D7=1$, $D8=1$, $D9$ and $D10=0$
second generation rent control regime D	Dummy variable that turns 1 if $D1$ and/or $D3=1$, $D2=0$, $D7=1$, $D8=0$, $D9$ and $D10=0$
free rent regime	Dummy variable that turns 1 if $D1=0$, $D2=0$, $D3=0$

modifications by Mora-Sanguinetti (2010). Basu and Emerson (2000) build a partial equilibrium model for the private rental housing market where the market is confronted with information asymmetries between the agents – landlord and tenants - and with adverse selection. Consequently, the model helps in explaining the effects of contemporary soft regulation regimes including the effects of tenure security. The basic model deals with a strict intertenancy de-control regime and high tenure security. The modifications made by Mora-Sanguinetti (2010) widen the application of the model on contemporary rent regimes.

3.1 Data Description with Various Rent Control Regimes

This section describes the variables as well as different rent control regimes that we use in the quantitative analysis. The data gather economic information on 18 advanced economies from 1973 to 2014. Table 4 describes the data used as variables and their sources.

Table 5: Summary Statistics'
Descriptive Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Real Rent	725	0.006	0.041	-0.304	0.306
Nominal Rent	725	0.051	0.054	-0.363	0.372
Real GDP per Capita	725	0.017	0.022	-0.087	0.097
Inflation	738	0.046	0.045	-0.058	0.270
Real House Prices	716	0.022	0.088	-0.236	0.609
Nominal House Prices	716	0.068	0.096	-0.221	0.852
Population	738	0.006	0.005	-0.017	0.050

Note: The summary statistics show annual growth rate.

The nominal rents mostly come from the OECD. The rents are from the OECD housing market dataset (Kennedy et al. 2006). Rents from countries that are not covered by the OECD data come from official national statistic agencies. Basically, nominal rents are taken from the OECD and national agencies for the different countries, states or towns. Due to a serious lack of data for Ontario, New South Wales, California and Massachusetts, rents from the biggest cities of these states are used as a proxy for the whole state.¹⁶

The majority of consumer price data is from the Thomson Reuters database. Countries not fully covered by the mentioned database are taken from official national agencies such as the FRED database of the Federal Reserve Bank of St. Louis or the Australian Bureau of Statistics. The real GDP per capita data and the population data are taken from the World Bank Dataset. For all economies, the GDP per Capita is displayed in US-Dollars. For Ontario, New South Wales, England, Massachusetts and California the country data are taken as proxies due to a lack of official state data for such a long time horizon. Nominal house price data for the mentioned countries are mostly from the mentioned OECD database and other databases of official agencies. Table 5 shows the summarize statistics on these variables.

The transfer of rental market regulation (see section 2) into mutual exclusive rent control regimes is explained in the following. The different rent control regimes are divided up into

¹⁶ House price indices for Austria and New South Wales were too short. The basic series was then continued with a reasonable house price series of the same country by using its growth rates.

six mutual exclusive regulation regimes, namely first-generation rent control regimes, second-generation rent control regimes and free rent regimes. Second-generation rent regimes in turn are stratified in four regimes along different levels of tenure security. According to Arnott (1995) tenure security is a crucial determinant of how the regulation of rent may impact rents or the whole housing market. The different regimes are listed from A to D and will be explained in alphabetical order. The source for the differentiation are the different dummies presented in Table 1.

All second-generation rent control regimes have the same soft rent regulation, which is rent level regulation or real rent freeze regulation as defined in section 2. Both a nominal rent freeze regime and a rent free regime are left out here meaning that dummies D1 and/or D3 equal one. Dummy D2, however, is zero. Intertenant decontrol that is checked by D4 is not considered here. First, this is due to the larger samples for every regime guaranteeing higher quality for the panel estimation. Second, it is assumed that in a world of soft rent control landlords have a stronger bargaining power at the beginning of a tenancy when several tenants contest for a tenancy. Tenants, however, enjoy higher power during the term thanks to tenure security. Then, landlords might be less able to get the maximum lawful rent escalation since tenants may reject the landlord's interest much easier as they already live in the dwelling. Thus, it is assumed that there is always some sort of intertenant decontrol in soft rent regulation regimes.

The second-generation rent control regime A displays a regime with soft rent regulation and a very high tenure security with eviction protection during and at the end of a term and a mandatory minimum duration and/ or a prohibition of short term tenancies. Regime B checks for a rent regime where tenants are safe from unreasonable eviction during the tenancy but not at the end of a term or period. Furthermore, type-B regimes offer a mandatory minimum duration and/or prohibited short term tenancies as defined in section 2. In turn, regime C mirrors another type of tenure security in which tenants are protected from unreasonable eviction during and at the end of a tenancy term or period. Minimum duration terms are not mandatory by law and short term tenancies are not forbidden. Regime D differs from the type-C regime in the way that

tenants are only protected during a period or term but not at the end. There are no mandatory minimum durations and short term tenancies are allowed.

First-generation rent control regimes and free rent regimes are not differentiated by tenure security. The underlying assumption is that tenure security does not crucially matter for the evolution of rents for both, first-generation rent control regimes and free rent regimes. As for free rent regimes, it does not matter whether tenure security is high or low since landlords may freely adjust rents at any point of the contract since there are by law no restrictions (Basu and Emerson, 2000). On the other hand, first-generation rent control regimes follow a similar logic. As rents cannot be adjusted between or during the term of a tenancy, the effects of tenure security may be negligible. Furthermore, there is nearly a full coincidence of nominal rent freeze¹⁷ regimes and high tenure security in the form of high protection against eviction and minimum duration terms and forbidden short term tenancies.

3.2 Empirical Results

Before presenting the results, some aspects should be noted here. We refer to the free rent regime as our benchmark regime when analyzing the effects of the rent regulation on different regimes. As our objective is to present the interaction between regulation and rent dynamics in the simplest and most transparent empirical method without the lose of generality and focus. Nevertheless, we include various robustness tests such as adding country and time fixed effects for our analysis to strengthen our results. Even with various robustness estimations, we note that many adequate control variables such as vacancy rates are not available for the vast majority of economies for the whole observation period.

Table 6 presents the mean growth rates of real rents for the different rent regimes.¹⁸ The following three observations are noticeable: First, real rent dynamics are on average negative for

¹⁷ Nominal rent freeze can be misleading here since the data shows that nominal rents were indeed adjusted. However, mostly the rent adjustments under these regimes turned out to be much lower than consumer price inflation.

¹⁸ See Figure 5 in the Appendix for the detail rent regimes for the economies in question.

Table 6: Real Rent Growth by Regimes

Variables	Real Rent	Observations	Std. Dev.
First generation rent control regime	-0.012	105	0.048
Second generation rent control regime A	0.004	95	0.030
Second generation rent control regime B	0.022	50	0.077
Second generation rent control regime C	0.010	124	0.025
Second generation rent control regime D	0.009	158	0.023
Free rent regime	0.006	193	0.045

Note: This table presents the means of real rent growth for each rent regime. The analysis covers the sample of 18 advanced economies over the period 1973 - 2014. Data descriptions can be found in the Tables 1 and 5.

countries with the strictest rent control regime. Second, free rent regimes on average show real rents growth rate of 0.6 percent per year. Third, second-generation rent control regimes of the types B, C, and D show on average higher real rent growth rates. In this group, second-generation rent regimes with eviction protection during but not at the end of mandatory minimum duration term (type-B) show the highest real rent growth rates of more than 2 percent on average.

We also provide in Figure 4 the average real rent growth rates for all countries three years before and three years after the implementation of a new regime. The results confirm the results of Table 6 and the theoretical implications by Basu and Emerson (2000). While real rents on average fall in the first two years after the implementation of first-generation rent control regimes real rent growth rates undergo a visible upturn after the implementation of the second-generation rent control regime B. The introduction of a free rent regime in turn does not show any strong rent escalations on average. For the remaining second-generation rent control regimes a clear movement cannot be drawn.

Table 7 that shows the correlations between the different rent regimes and real rent growth further provides significant empirical evidence of the relationship between the growth of real rents and the rental market regulation regime. Table 7 shows three significant correlations at the ten percent level: (i) a positive correlation between second-generation rent control regime B and real rents, (ii) a negative correlation between first-generation rent control regimes and real rents, and (iii) a positive correlation between real GDP per capita growth and real rents. These results so far

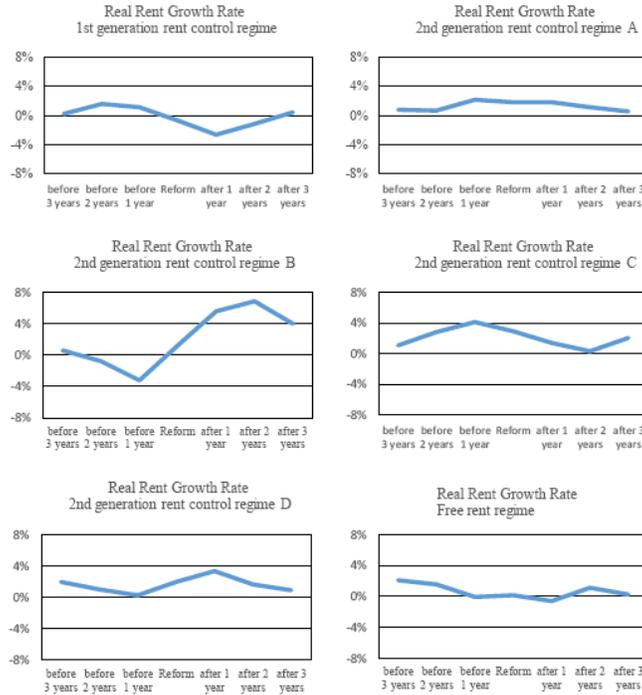


Figure 4: Real Rent Growth Before And After Rent Reform For All Countries

confirm the theory and previous statistical evaluation.

Table 8 shows the panel estimation results.¹⁹ The panel estimation addresses statistical problems that could emerge through heteroscedasticity and serial correlation by the use of robust standard errors and clustered errors. Both country and time fixed effects and robust standard and clustered error terms are used. Using country and years fixed effects, the estimation takes advantage of within-country variation in institutional variables (Djankov et al. 2007). Furthermore, the results of the Hausman test (Hausman 1978) support the decision to use of country fixed effects.²⁰

The dependent variable is the year on year growth rate of real rents for each country and year. Exogenous variables are several dummy variables as identifiers of different rent regimes, namely first-generation rent control regimes and the second-generation rent control regimes A, B, C and

¹⁹ Various robustness estimations are presented in the Appedix.

²⁰ The Hausman test can be found in the appendix of this chapter in Figure 8. Note, however, the simultaneous use of year fixed effects and clustered error terms brings the number of exogenous variables in a disproportion to the degrees of freedom of the model.

Table 7: Correlation Between Real rent and Its Determinants

	Real Rent
First generation rent control regime	-0.17***
Second generation rent control regime A	-0.01
Second generation rent control regime B	0.11***
Second generation rent control regime C	0.05
Second generation rent control regime D	0.05
Free rent regime	0.00
Real GDP/capita	0.07*
Population	-0.02
Real House Prices	0.01

***= significant at the 1% level; **=significant at the 5% level; *=significant at the 10% level

Table 8: Panel Regressions

	Model 1 Robust SE	Model 2 Cluster SE	Model 3 Cluster SE	Model 4 Robust SE	Model 5 Cluster SE	Model 6 Cluster SE
1st rent control regime	-0.027*** (0.007)	-0.027*** (0.006)	-0.031** (0.011)	-0.027*** (0.007)	-0.027*** (0.006)	-0.030** (0.011)
2nd rent control regimes						
Type A	-0.004 (0.007)	-0.004 (0.008)	-0.007 (0.009)			
Type B	0.026* (0.013)	0.026** (0.010)	0.027** (0.009)	0.026* (0.013)	0.026** (0.010)	0.027*** (0.009)
Type C	0.004 (0.009)	0.004 (0.009)	0.007 (0.009)			
Type D	-0.003 (0.008)	-0.003 (0.007)	-0.001 (0.008)			
Type ACD				-0.001 (0.006)	-0.001 (0.006)	-0.002 (0.007)
Real GDP/capita	0.163 (0.141)	0.163 (0.131)	0.176 (0.144)	0.165 (0.140)	0.165 (0.129)	0.181 (0.143)
Constant	-0.050*** (0.011)	-0.050*** (0.010)	0.005 (0.006)	-0.051*** (0.011)	-0.051*** (0.011)	0.006 (0.005)
Year Effects	Yes	Yes	No	Yes	Yes	No
Country Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	712	712	712	712	712	712
Adjusted R^2	0.13	0.13	0.08	0.13	0.13	0.08

This is a panel regression of 18 advanced economies over the period 1973 - 2014. The rent control regimes are discrete variables equal to one if the respective criterions are fulfilled. Robust standard errors and clustered standard errors are in parantheses. The dependent variable is the real rent growth rate. ***= significant at the 1% level; **=significant at the 5% level; *=significant at the 10% level

D. The other rent regimes except free rent regimes are pooled by a dummy as a control variable since the evaluation and theory did not give a hint for any correlations between real rents and the implementation of such a regime. Furthermore, the growth of GDP per capita is used as a control variable. The panel results show a statistically significant positive effect of second-generation rent control regimes B of 2.6 and 2.7 percentage points on real rent growth rates compared with free rent regimes. Furthermore, first-generation rent control regimes have a significant negative effect of -2.7 to -3.0 percentage points on real rent growth compared with free rent regimes. The growth of real GDP per capita on real rents, however, is not significant for robust and clustered standard errors. According to the estimation results, the adjusted R is on a low to medium level.

According to the panel estimation results, the results mostly back the theory. However, not all second-generation rent control regimes with a distinct level of tenure security match the theory. The estimation results show that there is no significant and robust relationship between the rent control regimes A, C and D and real rents. According to Basu and Emerson (2000), even for the regime A and C there should have been significantly higher growth rates than in free rent regimes. An intuitive explanation for this is that landlords may not be able to recalibrate the rents enough if tenancies are designed by law for an unlimited time because tenancies are too long to assess proper higher rents at the beginning. It is very likely that landlords have a much weaker bargaining position in these regimes since they are generally forced to negotiate rent adjustments during the term of a tenancy. In countries where the regulation regime offers tenancies unlimited in time (if $D8 = 1$) tenants stay up to ten or more years in the dwelling. In that context landlords have little space for a strong rent bargaining position. However, in regimes with time limited tenancies with a minimum duration of two or more years and no eviction protection at the end of the term, landlords regularly enjoy the more powerful bargaining position. These regimes may come closest to the reality which is theoretically described by Basu and Emerson (2000) and Mora Sanguinetti (2010).

To check for the robustness of the estimation results other control variables such as the growth

rate of population and the real growth rate of house prices are added. The robustness checks show that these additional variables do not influence the significance of first-generation and type-B second-generation rent control regimes. The results are presented in Figure 6 in the appendix. Furthermore, four different country samples are generated for further robustness checks. In each sample several countries with a certain legal origin are excluded. In eleven out of twelve estimations the results of Table 8 are confirmed. The estimation results can be found in Figures 7 to 9 of the appendix. Finally, the estimation results are even robust against a variation of the estimation's time horizon such as a six years cut-off at the beginning or end of the time period (Figure 9). However, shortening the time horizon dampens the explanatory power of the estimations since most rent freeze systems are located in the 1970s. In other words, the results in Table 8 are robust against different variations of the underlying data sample. In total, 28 out of 29 robustness checks fully confirm the results in Table 8.

4 Conclusion

In this paper, we construct an unique index that measures the regulation of private tenancy markets. Our index is the first time-variant index explaining the regulation of private tenancy markets. The index covers 18 advanced economies from 1973 to 2014 and consists of ten dummies that quantify characteristics of rent control and tenure security in each country. The index is able to mirror established classifications of private tenancy market regulation such as first and second-generation rent control regimes or tenancy rent control regimes. The sources of the index are both rent and tenure security laws and scientific country reports. Moreover, our time-variant index shows that the regulation of rental markets supports both the convergence theory and the legal origin theory. On the one hand, there are signs for the convergence of rent control of French and Scandinavian law countries towards common law countries. On the other hand, as far as tenure security laws are mentioned, French and German legal origin countries show on average no

signs of convergence with common law countries while Scandinavian law countries do. Thus, the differences in tenure security laws remained more or less stable among the mentioned legal origins.

Using our newly constructed rental regulation index, our empirical analysis confirms the theory. Our empirical results fall mainly into three areas. First, very strict rent control regimes do provoke lower real rent growth rates than regimes with free rents. This result coincides with the basic and very well-known textbook model. Second, tenure security plays a significant role for softer regulation types that belong to the group of second-generation rent control regimes: soft rent control regimes with time limited tenure security mandatory minimum duration periods may cause higher rent dynamics than rental markets under free rents. This is in line with the theoretical approach given by Basu and Emerson (2000) and Mora-Sanguinetti (2010). Their theories state that under adverse selection and information asymmetries, soft rent control regimes lead to higher rents if tenure security is high and landlords have greater power to adjust the rent at the start of the tenancy rather than during the term of a tenancy. In contrast to Basu and Emerson's model, however, a statistically significant rent appreciating effect cannot be shown for soft rent regimes that encourage tenancies unlimited in time through profound eviction protection rules. An explanation may be that landlords are in a weaker position for too long to reach the critical value towards effective bargaining power. This situation is ensured by rent regimes where tenants may stay in a rented dwelling very long due to time-unlimited tenure security.

Third, the rent free regime that is also the benchmark regime on average does not show high real rent appreciation rates. Instead, the data reveals that the mean real rent growth is slightly over zero for free rent regimes. Furthermore, high rent appreciation rates are not conducted shortly after the implementation of free rent regimes. This is antithetic to the often politically exploited view that a lack of regulation tremendously heats up rents.

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5 Appendix

5.1 Country Reports

Australia

In Australia the different states are responsible for the regulation of the private residential rental market. Thus, private tenancy law varies within the different states. Yet, to clarify the overview, New South Wales (NSW) as the biggest and most important Australian state is analysed and used in place of the whole country in the following. In NSW the regulation of tenancies has its origin in 1847; the first act was passed in 1899. The period of rent control began with the Fair Rents Act in 1915 (Simpson 1999; Schneller 2013). The most important act after the Second World War was the Landlord and Tenant Act from 1948 (New South Wales Government 8/16/1948). According to the act, rents were strictly regulated by fair rents boards and did not match market rents.

Furthermore, tenancies could not be terminated by landlords without certain grounds (New South Wales Government 8/16/1948, § 62). The act was amended several times, the regulation of rents, however, remained unrestrained until the 1950s. In the mid-1950s, newly built and vacant dwellings were decontrolled (Schneller 2013, §§ 44–50). In 1960 around two-third of all rented dwelling stock was regulated by the Landlord and Tenant Act (Simpson 1999). In 1968 several important amendments were made. As a consequence, fair rents stopped being calculated after the strict principles of 1939. Through new ways of rent calculations tenants and landlords were able to increase rents to the maximum level of a so far fair rent as long the tenant was able to pay it (Schneller 2013). Protected tenancies decreased tremendously in the upcoming years.

In 1987 the new Landlord and Tenant Act became the central law for tenancies in NSW. The act lowered the security of tenure. Tenants just enjoyed eviction protection during the term of time fixed tenancies. However, at the end of the fixed term and the payment period of periodic tenancies, landlords did not need to give special reasons in order to repossess the rented dwelling

(Simpson 1999). Rents and their development were free to be agreed upon. However, tenants could claim that rents were excessive if the rent exceeded the comparable rent level calculated by the rent tribunal. Generally, the comparable rent equals market rents for comparable premises (New South Wales Government 5/12/1987, §§ 44–50). After some minor changes the Residential Tenancy Act 1987 was repealed by the Residential Tenancy Act 2010. However, the new act did not tremendously change the regulation of rent and tenure security of the RTA from 1986 (Schneller 2013).

Austria

The Austrian tenancy market was intensively intervened by government before and during the Second World War (Lurger 2005). In the 1960s and 1970s rental market regulation was slightly modified. The most important law adjustments during that period were the Amending Law of Tenancy 1967 (Bundeskanzleramt 8/4/1967) and the Amendment to Rent Law 1974 (Bundeskanzleramt 7/25/1974). The Amending Law of Tenancy had the aim to liberalise rent and eviction control in 1967. The Amendment to Rent Law, on the other hand, intensified the control of rents and eviction procedures (Amann 1999). On balance, Austrian tenancy law favoured tenants' interests in the 1970s. Rents did not match market rents and tenants enjoyed a high level of tenure security. Rents for rental dwellings built after 1967, however, were free.

In 1981 the Austrian parliament passed the Tenancy Law Act (Bundeskanzleramt 12/1/1981) giving the Austrian rental market regulation its current character. The new act incorporated not only principles of the previous law but also new ways of calculating rents of private tenancies. Nevertheless, there exist several types of regulation for rented dwelling in Austria since both the rules of the Tenancy Law Act 1981 and the Austrian civil code are the basis of the current private tenancy regulation. This makes the Austrian tenancy law very complicated today. Since the implementation of the Tenancy Law Act there have existed three different types of private tenancies. Each is regulated differently – either solely by the Tenancy Law Act from 1981 (type-3-tenancies) or the civil code (type-1-tenancies) or as a mix of both legal sources (type-2-tenancies).

As far as the regulation of rents is concerned, rents of type-1- and type-2-tenancies are not regulated. Here, the rules of the civil code hold. Therefore, the only rule that limits rents and rent increases is the violation of moral principles through deception culminating in dubious high rents. The following dwelling types are type-1- and type-2-tenancies: dwellings built after of 1953 , one- or double-family-houses and roof top properties that got a building permission after 2001 (Böhm 2002; Bundeskanzleramt 12/28/2001). According to the current numbers of the Austrian tenancy market, the majority of private tenancies fall under a rent free regime (Oberhuber, Denk 2014). Type-3-tenancies, however, provide regulated rents. Rented dwellings of this type are the second biggest group in the private tenancy market. Category rents and benchmark rents are the dominant types of rent regulation here. Considering these two methods of rent control, rents have to follow the principles of comparable rents. Under these rules rents constantly fails market-based rents.

Aspects of duration and eviction procedures of the majority of all rentals are highly regulated in Austria. Both, type-2- and type3-tenancies fall under the strict eviction control rules of the Tenancy Act from 1981. Under this law, landlords may only terminate tenancies for reasonable grounds defined by law (Bundeskanzleramt 12/1/1981). In general, tenancies in Austria are unlimited in time. However, time limited tenancies are allowed in Austria but since 1993 they have had to fulfil a minimum duration of three years (Bundeskanzleramt 11/26/1993). Simultaneously, the rent had to be 25 percent under the comparable rent of a similar dwelling without time limitation. Thus, they currently do not match the conditions of classic short-term tenancies. Before 1993, private tenancies had a time limit of one-year maximum. From 1997 to 2000, time limitation was temporarily raised to ten years (Bundeskanzleramt 12/28/2001).

Canada

In Canada, states are responsible for the regulation of private tenancies. Ontario is the largest province of Canada's nine provinces in terms of its population. Thus, tenancy law in Ontario is presented here. Strict private tenancy rules were introduced for the whole country in 1940

but were abolished soon after the Second World War. At the end of 1960s, the first Tenancy Act in Ontario was passed (Supreme Court of Canada, of 5/28/1981; Miron 1995). The new act only ruled the relation between landlord and tenant. Rents were not touched by that law which distinctly increased the security of tenure. Landlords were just allowed to evict tenants during and at the end of a period for special reasons that were defined by law.

In 1975, the Residential Premises Rent Review Act (RPRRA) established a first-generation rent control regime in Ontario but some rented dwellings were not covered by this law. It applied only to rental dwellings in existence prior to 1976. The new act introduced guideline increases for rents from six to eight percent of the rent per year and also enabled a restricted cost pass-through (Miron 1995). However, the majority of tenancies fell under a first rent control regime. In 1979, the Residential Tenancies Act (RTA) replaced the RPRRA. The new act set guideline rates of rent increase to a maximum of six percent per year. Tenure security did not change. The rent guidelines were in force until 1985 when the Residential Rent Regulation Act (RRRA) pushed the guideline rate to four percent. From 1986 to 1992 rent increases were calculated by a formula related to changes in costs of maintaining rental buildings called the Residential Complex Cost Index. Initial rents had to follow a comparable rent that was the upper rent ceiling. With the RRRA rent regulation rules applied to all rental dwellings irrespective of their construction year and the amount of rent (Richmond, Stobo 1996; Miron 1995).

In 1992 the Rent Control Act (RCA) came into force. The guideline rates now had to follow inflation rates and average costs. Rent increases were not allowed to overdo these guidelines by three percentage points. Hence, there was an upper limit on the maximum permitted rent increase (Richmond, Stobo 1996; Miron 1995). Five years later, the Tenant Protection Act 1997 was passed. It came into force in 1998. The main change to its predecessor was the implementation of intertenancy decontrol meaning that initial rents were decontrolled while rents during the term were regulated by guideline increases (Smith 2003). The Residential Tenancies Act 2006 replaced the Tenant Protection Act 1997 in 2007. Compared to its predecessor, the act set nearly identical

guidelines for rent increases but did not control the rents for newly made tenancies. The new act merely focussed on rescheduling the institutional responsibilities. Thus, it replaced the Ontario Rental Housing Tribunal for the Landlord and Tenant Board to resolve disputes between tenants and landlords.

Denmark

The regulation of private tenancies in Denmark began with the First World War. Rent control was relaxed in the aftermath of the war. In the 1930s, however, rent freezes and very high tenure security were introduced again in the run-up to the Second World War. The first-generation rent control regime survived the Second World War. From 1966 to 1974, rental market regulation was relaxed stepwise. The aim was to lift up rents to market level through fixed rent increase guidelines. However, due to an extraordinary high inflation during those years, the real rent level did not change much (Whitehead et al. 2012; Edlung 2003). At that time most Danish rentals were regulated by the principles of rent determination from 1939 and their amendments (such as the one from 1966). Under this regime, rents followed the value of the rented property. According to the law, rents could not be higher than the rent for a comparable letting. If the rent was remarkably lower than the comparable rent landlords were allowed to raise the rent to this upper rent ceiling (Whitehead et al. 2012; Edlung 2003).

In 1975 the Danish government passed a new law introducing new principles of rent control (Boligreguleringsloven). This law is still the most applied regulation for private tenancies in Denmark holding in municipalities with a population of more than 20,000 inhabitants. Other municipalities can choose between the former regulation named Lejeloven and the updated rent regulation. Under the law, initial rents are restricted by a cost-of-the-dwelling system. During the tenancy, however, landlords are allowed to pass cost increases on to the tenant. Furthermore, rents have to be similar within the same apartment building. Stepped rents have to be defined in the contract. That kind of rent adjustment is only allowed if the initial rent is below the cost-based rent level, however (Whitehead et al. 2012). Tenure security remained high under the new law.

Landlords need special reasons defined by law in order to evict the tenant. Short term tenancies are allowed if they last less than two years and end automatically (Scanlon, Kochan 2011).

In 1991, a tenancy law was passed introducing new construction decontrol in Denmark. According to the new act, the rents for private dwellings built after 1991 were decontrolled. Rent increases were limited however to the inflation rate or to annual step-by-step increases (trappeleje) that had to be predefined in the rental contract. In 2004, rents for rooftop dwellings were also deregulated (Whitehead et al. 2012; Edlung 2003). Due to a low post-1991 housing stock, the minority of rented Danish dwellings is currently ruled by this law. The most important system is rather the cost-based rent control system followed by the value-based system (OECD 2006).

United Kingdom

Tenancy law differs in England/Wales, Scotland and Northern Ireland. Since England and Wales constitute by far the largest part of the United Kingdom, tenancy law in England is described here. In England tenancy regulation has undergone a strong transformation process in the past fifty years. The transformation from a highly regulated private tenancy market to the weakly regulated one that it is today began in the 1950s when tenancies with rents above a certain level were deregulated (Hubert 2003). In 1965, a new tenancy law reinvented the regulation of all private tenancies. The basis for all tenancies was from now on the ‘fair rent’ system. These fair rents stayed more or less unchanged and did not match the level of market rents (Hubert 2003). Tenancies were unlimited in time and tenure security was high. Evictions during and at the end of the term without special reasons were not allowed.

The Housing Act 1980 introduced new forms of regulation and terminated the few remaining controlled tenancies dating back to the 1950s. At that time, the most relevant form of renting was the Regulated tenancy. Rents of Regulated tenancies followed a “fair rent” system (Department for Communities and Local Government 2009b). Tenants enjoyed eviction protection during and at the end of the period or term. Furthermore, the new law allowed the so-called Shorthold that allowed rent contracts to be limited in time (Holmans 2005). Another new tenancy form,

the Assured tenancy, applied only to new and renovated dwellings that were in possession of organizations accepted by the Secretary of State for the Environment and, therefore, just played a negligible role (Stephens 2005).

With the Housing Act of 1988 and 1996, English tenancy law has undergone a severe change. Two new forms of tenancy were introduced which are still in effect: the new Assured tenancy and the Assured Shorthold tenancy. The market power of landlords in England has been tremendously strengthened with these acts. Most tenants are no longer able to exercise their rights properly (Cowan, Laurie E. 2005). Before the Housing Act of 1996, every tenancy had automatically been an Assured tenancy, unless it was agreed upon that it was not. Under the new act, new tenancies automatically become an Assured Shorthold unless it is contracted otherwise (Department for Communities and Local Government 2009a). Nevertheless, Assured Shortholds have quickly become the most common tenancy in England after 1988.

With Assured Shortholds, landlords possess the most power that English tenancy law offers. Tenure security is low since landlords may evict tenants without giving reasons at the end of the contract period. Yet, during the tenancy period tenants enjoy severe tenure security (Department for Communities and Local Government 2009a). Assured tenancies, in comparison, offer tenants much more security since these contracts are usually unlimited in time. Here, the landlord can only regain possession of the dwelling for reasonable reasons that are defined in law (Department for Communities and Local Government 2009a). Initial rents may be negotiated freely for both Assured tenancies and Assured Shorthold tenancies (Cowan, Laurie E. 2005). During the tenancy, rent increases have to be orientated to the fair rent level which consists of a system of comparable rents. Tenants may apply to a rent assessment centre if they think the rent adjustments are set too high. However, under Assured Shortholds tenants cannot exercise these rights properly due to a significant lack of tenure security at the end of the term of the tenancy.

Finland

Due to an economic downturn in the late 1960s, the Finnish government strengthened tenure

security in 1970 and installed a system of rent regulation in 1974 (Jóhannsson 1998). The new rent law replaced a system of strict rent control. At that period Finish tenancy law was quite regulated and tenants enjoyed a high degree of tenure security. Landlords were only allowed to evict tenants for reasonable reasons that were defined by law (Ralli 2005; Jóhannsson 1998). Under this system, the landlord was allowed to increase the rent according to guidelines that were defined by a council of ministers that involved tenants' and landlords' representatives. In practice, the annually updated rent standards did not match increases in costs of the dwelling not to mention market rents.

From the 1980s onwards a couple of new tenancy acts changed the relationship of tenants and landlords significantly. First, a new tenancy act was passed in 1987 after twelve years of preparation (Ralli 2005). Under the new law tenure security decreased marginally. Landlords were provided with more reasonable grounds to evict tenants (Ministry of the Environment 7/10/1987). Rents had to be reasonable and in compliance with the average rent of the area surrounding the dwelling. The act aimed at implementing a reasonable profit for landlords when letting the flat to a tenant (Ministry of the Environment 7/10/1987; Ralli 2005). During those years, rent increases became easier for landlords though it still remained difficult for landlords to adjust rents. Overall, rents failed to match market rents.

In the early 1990s, the finish tenancy market was tremendously deregulated. It started with the exemption from rent regulation for buildings built after the 1990 for rural areas. It was extended to all contracts signed on or after February 1st, 1992 everywhere in the country, regardless of the age of the dwelling. In 1995, the parliament passed a new law that made the deregulated rent system the sole system for the whole country. Under the new law, which is still in effect, the different parties are able to freely negotiate rents at the beginning and during the tenancy. Thus, a free rent regime is currently in use in Finland. However, rents may not be immorally decoupled from rents of similar dwellings in the surrounding area (Ministry of the Environment 3/31/1995). Tenure security is low in Finland. Landlords are free to give notice whenever they

want. Reasonable reasons are needed for the eviction of a tenant but the term “reasonable” is not defined by law. Rent increases during the term are seen as a reasonable ground. Solely, social aspects may play a substantial role at the eviction process at court (Ministry of the Environment 3/31/1995; Ralli 2005). Fixed term tenancies end without any notice at the end of the agreed rent-period (Jóhannsson 1998). Finland is currently one of the most deregulated private tenancy markets in Europe (Lyytikäinen 2006; Ralli 2005).

France

France introduced a strict rent freeze system in the Second World War which in contrast to many other countries did not last long. At the end of the 1940s, French authorities relaxed the regulations of tenancy contracts. Smaller communes were deregulated while only tenancies in larger communes were controlled. In the following decades, the number of tenancy controlled communes steadily shrank. In the mid-1970s, only a minority of private tenancies was regulated. In 1976, France installed a strict nominal rent freeze system to fight high consumer price inflation (Hubert 2003).

In 1982, a system of strict tenancy regulation was established by the law Quillot. The primary goal of the new law was to control rent inflation (Boccardo, Chamboredon 2005). The Quillot law covered all tenancies for residential living purposes. The new law explicitly favoured the tenant as a reaction to the lack of available lodging and the resulting power of the landlords. The basic elements of the new law were minimum terms of six years only binding for landlords, limited conditions of termination by landlords and strict rent regulations. Rents had to follow guidelines published by the housing association. The government even had the right to suspend rent adjustment throughout the whole country. Rents for newly constructed rentals, in contrast, could be freely negotiated between tenants and landlords (Moor 1983).

In 1986, the newly-elected Conservative government passed a law that aimed at encouraging landlords to rent out their apartments again (Boccardo, Chamboredon 2005). The Méhaignerie Act enabled landlords to easily evict tenants after a guaranteed three-year-duration of the tenancy

(Law n. 86-1290, §§ 9–10). Furthermore, the act allowed an unrestricted negotiation of initial rents (Satsangi 1998). However, rent adjustment by more than the change of the construction index was not allowed during the three-year-period (Law n. 86-1290, § 15). Despite the newly-gained freedom and power for landlords, tenants still enjoyed high standards of security during the three-years-term.

Only three years later, in 1989, the Mermaz Act was passed. It was a result of a consensus between the different political parties and undid some of the deregulation of the Méhaignerie Act. A minimum term of three years retained. However, the landlord's right to easily evict the tenant after the end of the minimum term was repealed. Initial rents could still be freely negotiated but yearly rent increases could not be higher than the French construction cost index and had to be mentioned in the contract. Furthermore rents may be increased in reference to the comparable rent after the minimum term ended (Law n. 89-462, § 17). Subsequent tenancy acts such as the ones in 1994 and 1998 did not deeply change the Mermaz Act.

Germany

The basic elements of the current German tenancy law were introduced in the 1970s. The German tenancy law is written down in the German civil code (BGB 2011). At that time, the tenant's security issues were strengthened particularly by two laws – the first and second Wohnraumkündigungsschutzgesetz (WKSchG). Furthermore, new rent control rules were enacted at that period (Häublein, Lehmann-Richter 2009). With the Rent Control Act of 1974 (Miethöhegesetz - MHRG) the rules for rent increases were defined (Wurmnest 2005). Yet there were always spatially and/or timely restricted exemptions by law such as the stricter rent control laws in West-Berlin before 1990 or the new rent control law (Mietpreisbremse) from 2015 that can be spatially effective for areas with housing shortages.

Tenants enjoy high standards of security in German tenancy law. Due to the mentioned laws introduced in the 1970s, landlords are seriously restricted in giving notice. Since then, there have not been any essential changes in law as to the security of tenants. In general, the landlord

may only evict the tenant for special reasonable grounds that are defined by law. Furthermore, evictions as a result of unjustified rent increases are not possible (Häublein, Lehmann-Richter 2009). Contracts limited in time are treated similarly. According to the German Civil Code contracts limited in time can be terminated only under special circumstances at the end of the rent period (BGB 2011, § 575). The basic rules in German tenancy law for contracts limited in time were introduced in 1982 (Köhler 1983). German rent regulation is based upon several different types of rent regulation and offers rent flexibility in a moderate way. Generally, rent regulation refers to rent increases. The primal rent negotiation can be conducted without any restriction. There are exceptions, however, if there is a limited offer of dwellings, the landlord may not demand unreasonable rents (BGB 2011, § 558) or if initial rents are restricted by law for certain years for a special region (Mietpreisbremse).

Rent increases during the term are regulated, there exist three different forms. First rents may be increased up to an upper ceiling that is the comparable rent. However, the rent may not be increased by more than 20 % within three years (BGB 2011, § 558). This rule was implemented in 1982 and was modified several times (Köhler 1983). Secondly, the stepped rent increase (Staffelmiete) was implemented in 1982. Here, landlord and tenant may contractually agree upon several prospective rent increases (BGB 2011, § 557). An upper limit does not hold for this kind of rent increases (Rebmann et al. 2008). Yet, immorally high rents are still forbidden. Thirdly, index-claused increases are allowed in Germany to an official cost of living index (BGB 2011, § 557).

Ireland

From the early 1980s until 2004 the majority of Irish tenants did not enjoy any kind of long- or medium term security of tenure and rents. Before tenancies had been regulated by the Tenancy Act 1960 and 1967. However, not all tenancies were covered by this very strict and complicated rent and eviction control law (Ryall 2005). With the beginning of the 1980s, the Irish Supreme Court declared the Rent Restrictions Acts of the 1960s an “unjust attack” on landlords’ property

rights (Ryall 2005). In the aftermath, the first-generation rent control regime expired and a free rent regime became dominant. Until the beginning of the 1990s there was no significant change in tenancy law in Ireland.

The Housing (Miscellaneous Provisions) Act from 1992 did not change the proportion of power among tenants and landlords in Ireland, it just introduced some minimum standards. The free rent regime was still in force and landlords could easily give notice (Government of Ireland 7/23/1992, §§ 16–18). There existed two main forms of residential tenancies: fixed term and periodic tenancies. Under the law of 1992, both forms were subject to free market rents. As for periodic tenancies, landlords were able to raise rents without any reason if they wanted to. In case the tenant did not accept the rent increase, the landlord was allowed to evict them. Thus, the landlord could fix the rent without restriction. Under a fixed term tenancy, stipulated rents were immutable for the duration of the tenancy. Once the term of the tenancy had ended, however, the landlord was able to increase the rent for a new fixed term tenancy. If the contract period expired, the landlord was not obliged to renew the contract (Ryall 2005).

In 2004, the Irish law enacted a new residential tenancy act. It was the most important change in private tenancy law in decades. Today, it is the basic principle of the Irish tenancy law (Norris 2011). This Residential Tenancy Act increased the tenure security for tenants significantly. The new legal framework covers both, a periodic and a fixed term tenancy (Ryall 2006). According to the new law, initial rents and any subsequent rent adjustments may not be higher than the “market rent” that is defined as the rent that landlords are willing to get and the tenants are willing to pay in regard to other comparable dwellings (Ryall 2006). The most important improvement in terms of the security of tenancies is that tenants enter a statutory tenancy of three and a half years once they have successfully passed six months of continuous occupation of the implied dwelling. In the first six months of a tenancy, landlords are allowed to evict the tenant without giving reasons. The tenant can enter a new four-years-tenancy only if the landlord does not give notice before the end of the first four-years-tenancy. Then, a new probationary period of six months starts. In

case of statutory protection the landlord may terminate the tenancy only on reasonable grounds (Ryall 2006; Norris 2011; Irish Government 7/19/2004).

Italy

After the strict rent control regime during the First World War regulation of tenancies enjoyed a revival in the 1920s. At that time, a first-generation rent control regime was installed. In the upcoming decades several amendments were made. From the Second World War until the end of the 1970s rents were strictly controlled in Italy. In addition, special acts made the termination of rental contracts for landlords nearly impossible (Breccia, Bargelli 2005). According to this restrictive regulation regime, tenancy contracts were automatically renewed (Bianchi 2014). Hence landlords were not able to repossess their rented dwellings or rent their property for a profitable rate of return. Rents filed to match market rents. In these decades, the system of tenancy regulation in Italy equalled a first-generation rent control regime.

The steadily growing public criticism of the predominant tenancy regulation regime culminated in a new tenancy act in 1978 (Law n. 392/1978). The new act represented the first complete set of rules for the regulation of tenancies. Tenants kept the high standard of tenure and rent security and the duration of tenancy was strictly fixed (Bianchi 2014). Rents were determined by a fair rent system that followed the regime of comparable rents with fixed upper ceilings (Law n. 392/1978, § 12). Under the law of 1978, tenancies had to last for at least four years (Law n. 392/1978, § 1). Landlords could not evict tenants without giving special reasons that were defined by law (Law n. 392/1978, § 59). However, contracts automatically end at the end of the minimum duration term (Breccia, Bargelli 2005). In 1992, rent regulation was relaxed by a new act. Under the new statute (Law n. 359/1992) newly built dwellings were excluded from the current rent regulation regime.

In 1998, the current system of rent regulation was established. Under the new act (Law n. 431/1998) most principles of the former Fair Rent Act were substituted by new rules. Thus, initial rents may be negotiated freely between landlord and tenants for ordinary tenancies. That

holds even for rent adjustments during the contract period (Law n. 431/1998, § 13). Hence, a free rent regime was established for the majority of tenancies in Italy. Yet, the rents for a special form of private tenancies are heavily regulated, namely dwellings that are supported by the Italian government. Here, rents have an upper limit that is determined by tenant and landlord associations (Breccia, Bargelli 2005). Tenure security is very high under the new act for all tenancies. Minimum terms of four years with strict eviction rules are stipulated by law. These rules hold also at the end of the term. Landlords are only allowed to evict tenants by giving special reasons that are defined by law (Breccia, Bargelli 2005).

Netherlands

Rental market regulation was well developed in the aftermath of the Second World War and tenants in the Netherlands were given much power. At that time, it was nearly impossible for landlords to evict a tenant and rents were raised and lowered by the Dutch government. In the 1960s rent control was slightly relaxed. In the 1970s a tremendous political fight began between advocates of a more liberalized and defenders of a regulated private rental market. In the end, the proponents of a generally regulated rental market came off as the winners. The oil crisis and its massive economic burden for the Dutch economy may have fostered the mentioned development in the Netherlands (Jan van der Schaar 1987). In 1979, the old tenancy law called “Woonruimtetwet” was replaced by a new law named “Huurprijzenwet”. The introduction of the “Huurprijzenwet” resolved the confusing state of tenancy law at that time and Dutch tenancy contracts maintained regulated (Adriaansens, Fortgens 1990).

According to the Housing Act of 1979, tenants enjoy high protection against eviction by the landlord. Landlords may give notice only under special circumstances which are defined by law. Dutch tenancy law does accept short-termed tenancies. However, an eviction of the tenant at the end of the contract is only lawful in case of personal need by the landlord. Otherwise time limited contracts automatically convert into unlimited contracts (Adriaansens, Fortgens 1990; Rueb, Kaufmann 2005). Rents can be freely negotiated between landlords and tenants. However,

the rents have to be in line with the point-system that is linked to the quality of the dwelling. According to that point system, every apartment has a maximum rent that can be charged. The rent regime works like a comparable rent system that is updated once a year. If the rent seems to be too high for the tenant, they may raise a complaint at the “huurcommissie”, which lowers the rent if the rent cannot be justified by the points. The “huurcommissie” can be considered a rent tribunal (Adriaansens, Fortgens 1990; Haffner 2011). In 1994 rent became decontrolled for dwellings of higher standards (European Central Bank 2003). Rent increases are possible only once a year for both liberalized and non-liberalized dwellings. Although there was a change in housing law in 2003, rent regulation and tenure security remained more or less unchanged. The new law of 2003 just incorporated the rules about maximum rents into the Dutch Civil Code (Rueb, Kauf-mann 2005).

New Zealand

Private residential markets were highly regulated in the aftermath of the Second World War. An important milestone in the post war era was the Tenancy Act of 1955 (New Zealand Parliament 10/21/1955). It established a significant rent and eviction control regime for private tenancies. Rents had to follow the principles of fair rents and were fixed by a rent officer (New Zealand Parliament 10/21/1955, §§ 18–19). The method of fixing the rent was defined by law (New Zealand Parliament 10/21/1955, §§ 20–23). The Tenancy Act 1955 did also address the relation between landlords and tenants: landlords were not allowed to evict tenants without giving reasons that were defined by law; both at the end of and during a term (New Zealand Parliament 10/21/1955, § 36). However, rental dwellings that were constructed after 1955 were excluded from the Tenancy Act of 1955 (New Zealand Parliament 10/21/1955, § 6). In the following three decades, the act was amended several times and minor changes were made. Yet, in 1973 the Rent Appeal Act was passed which applied to all those dwellings that had not been addressed by the Tenancy Act of 1955 (New Zealand Parliament 10/2/1973, §§ 29–30). It introduced the principles of the equitable rent: Rent Appeal Boards were enabled to assess and fix the equitable rent of the mentioned

premises (New Zealand Parliament 10/2/1973, § 6). The equitable rent worked like a comparable rent regime. Rent increases were generously cut to a maximum of 15 percent per year (New Zealand Parliament 10/2/1973, § 8).

After some minor amendments of the current tenancy law private rental market regulation was significantly changed under the Residential Tenancies Act of 1986. It currently holds for the great majority of all rented dwellings. Rents are free to be negotiated under the Residential Tenancies Act. Nevertheless tenants may claim excessive rent increases at Tenancy Tribunals for rental assessment (New Zealand Parliament 12/17/1986, §§ 23–24). According to the act tenancies can be either a short-term or periodic tenancy. Landlords are allowed to evict tenants only for special reasons defined by law (New Zealand Parliament 12/17/1986, §§ 50–55). However, tenancies automatically end at the end of a fixed or periodic term of a tenancy. Periodic tenancies just renew automatically after a special period if no party give notice. Fixed short-term tenancies end automatically at the end of the term. There were several minor amendments to this act in 1992, 1996 and 2010 that did not crucially change the regulation of private tenancies in New Zealand.

Norway

The regulation of private tenancies started during the First World War. In the aftermath of the war rents remained strictly controlled. Passing the Landlord and Tenant Act a softer rent and eviction control regime was introduced in Norway. At that time housing committees were enabled to determine guidelines for rent increases. Often, rent increases more or less equalled the Norwegian inflation rate. Rent adjustments due to renovation work and other improvements were allowed (Whitehead et al. 2012; Lilleholt 2014). Newly built rental dwellings were exempted from rent control. Although there were several amendments to rental market regulation in the years after the Second World War the old control regime was in force in Oslo and Trondheim until the end of the century. In 1982, the number of municipalities that had strict rent restrictions for buildings built before 1940 was reduced from ten to three (Oslo, Trondheim and Bergen). After that, the rent for the majority of rented dwellings was unregulated (Langsether, Medby 2005).

In 1999 a new Landlord and Tenant Act was passed by the Norwegian government. The new act abolished the old regulations of tenancies. Initial rents were and are still allowed to be set freely by tenants and landlords. Rent increases, however, are index-linked. They have to follow the official retail price index in Norway. As in most other countries of the sample, unmorally high rents in relation to the mean rent for similar dwellings are forbidden in Norway. Greater rent increases than the annual growth rate of the retail price index are allowed every three years in order to match comparable market rents (Whitehead et al. 2012). In 2010, Oslo as the last Norwegian city removed the control of pre-war rental stock (Whitehead et al. 2012). The security of tenure underwent some changes, too. Landlords may not evict without giving special reasons defined by law. However, these eviction rules just hold during the term of a tenancy. Landlords are allowed to get easily repossession of the rented dwelling at the end of a time limited tenancy without giving special reasons. Yet, time limited tenancies have to last at least three years which means that classical short term tenancies - as defined in chapter 2 - are not allowed in Norway (Whitehead et al. 2012; Lilleholt 2014).

Spain

In the aftermath of the Spanish Civil War, there were several updates in Spanish tenancy law. The tenancy market was strictly regulated in those years. The government introduced a new tenancy law in 1964 that dominated the Spanish rental market until the 1980s (Mora Sanguinetti 2010). Under the jurisdiction of the Urban Tenancy Act 1964, tenure security was very high. Landlords had no real chance of repossessing their dwellings while tenants were able to renew their tenancy contracts as often as they wanted, if they reliably paid the rent. Under special circumstances tenants could pass on the right of living in the dwelling. Rent adjustments were hard to achieve for landlords. Even though limited rent increases were possible, the range for rent increases was low. Thus, rents were below true market level. Yet, there was the possibility to increase the rent after the initial five years of the contract (Blas López 2005; Ministerio De Justicia 12/24/1964; Mora Sanguinetti 2010).

In the 1980s, the Spanish government aimed at revitalizing the tenancy market, hence implementing the Boyer Decree in 1985. The Boyer Decree was designed to liberalize the Spanish tenancy market (Blas López 2005). There were three main changes: First, landlords were now allowed to transform private tenancies into business leases. Furthermore, the two parties were free to negotiate the initial rent level. And finally, there was the abolition of the indefinite lease renewal: the two parties were now free to determine the term of the tenancy (Jefatura des Estado 4/30/1985, §§ 7–11; Blas López 2005). Thus, the Boyer decree allowed short term contracts. However, rents in Spain were still linked to the Spanish consumer price index and the new law was only applicable for contracts that were signed after the implementation of the decree.

In 1994, the government introduced a new tenancy act. The Urban Tenancy Act 1994 (Jefatura del Estado 11/24/1994) revisited the idea of blocked rents and lease renewals. The act implemented a minimum term of five years for every tenancy. Even if the two parties agreed on a tenancy lasting less, the tenant could prolong it to a five-year contract. There was only little room for exceptions. Once the minimum term was over, the tenant was able to prolong the contract for three more years up to an all in all contract length of eight years (Blas López 2005). According to the Urban Tenancy Act 1994, landlords and tenants were free to determine the initial rent. In the first five years of the tenancy, rents could only get raised once a year. During that period, the rent increase could not be higher than the annual growth rate of the consumer price index. Afterwards, the amount of rent could be modified according to what the parties agreed upon but the raise could not be more than 20 % of the original rent (Blas López 2005; Jefatura del Estado 11/24/1994, §§ 17–20).

In 2013 the Spanish government updated rental market regulation in Spain. The aim of the new regulation was to liberalize the up to then deeply regulated tenancy market. According to the Act on Flexibilization and Promotion of the Rental Housing Market (Jefatura del Estado 6/4/2013) the minimum duration for private tenancies was reduced from five to three years and its extension from three to one year. Furthermore, rent increases for new leases are now to be

freely determined in the contract. The rent increases need not be bound to the to the consumer price index anymore (Cuerpo et al. 2014).

Sweden

Sweden's tenancy law has not undergone severe changes in the past fifty years. The general act of Swedish tenancy law was introduced into the Land Code in 1970 (Justitiedepartementet 1970). The relevant part for rent issues is chapter twelve of the Land Code ("Hyra"). Since 1970, there have been constant but minor changes in the private tenancy law (Jensen 2005). In Swedish law, the tenant enjoys an extensive protection and landlords may terminate the tenancy under special circumstances that are defined by law (Justitiedepartementet 1970, §§ 42–55). In general, the landlord has to file a suit in the District Court to remove the tenant. Furthermore, the tenant may lose their right of prolongation of the contract if the mutual trust between the two parties has been eroded, for example by repeatedly delayed rent payments or other defaults of the contract by the tenant. Apart from that, it is nearly impossible for the landlord to evict a tenant out of their rented property. The tenant may even sublet the rented dwelling in case of a temporary absence. Furthermore, there is the possibility for tenants to swap dwellings with each other. Short term tenancies cannot be enforced (Jensen 2005; Jóhannsson 1998).

The basis of the Swedish rent regulation is the Principle of User Value ("bruksvärdesprincipen"). It means that rental dwellings with the same utility value should have the same rent. Thus, rents must not be higher than the average rent for a dwelling that is comparable in terms of condition, size and location. If a rent exceeds the rate, tenants have the right to lower the rent through court or Rent Tribunal decision. The rent level is determined by the Associations of Landlords and Tenants. The comparative amount of fair rent is calculated with rents for dwellings owned by municipal housing companies (Jensen 2005). Thus, rents are determined by governmental institutions rather than by market developments.

A new law was introduced by the Conservative government in 2011 and changed the way comparative rents were calculated. It is widely considered an important step towards market

rents since before the comparable rent used to be determined by the Association of Landlords and Tenants more or less freely. The changes were outlined in a government declaration of 2010 (Regeringens proposition 2009/10:185). According to the new law, rents for municipal dwellings are no central landmark for fair rents in Sweden anymore. The utility value of a dwelling is now determined by collectively bargained rents, irrespective of whether the owner is a municipal housing company or a private landlord. Furthermore, the new law declares that rent levels that are considerably below the new comparable rates of dwellings can be adjusted (Socialministerium 3/4/2011).

Switzerland

The Swiss Code of Obligations (SCO) integrated tenancy law in 1881. Under this law, private tenancies the legal contract standard, the termination of tenancies and the responsibilities of landlords and tenants were ruled. However, a deep regulation of rents and high standards of tenure security were nonexistent. In 1911, a revision led only to minor changes. The rules of 1911 in the SCO were not changed until 1970. Yet, several temporary emergency decrees were enacted in the years between 1911 and 1970 leading to a system of controlled rents and higher tenure security. Therefore, the SCO was in force just in the periods of 1912 to 1914 and 1926 to 1936. In the meantime emergency laws and decrees modified the fundamental tenancy law of the SCO. In 1970 any tenancy regulation in Switzerland was abolished. Thus, until 1972 no regulatory rules for private tenancies - except the mentioned rules in the civil code - existed. In those years , there existed no consequent rent regulation (Rohrbach 2012; Furrer, Vasella 2005).

In 1972, a new act (Bundesrat 6/2/1972) was enacted to strengthen tenants' rights in Switzerland. Its main goal was to prevent malpractices in the private rental market. Therefore, a fair rent system was established. Swiss tenancy law had the aim of fighting abusively high rents. Rents had to orientate at the local reference rent (Bundesrat 6/2/1972, §§ 14–15). Thus, rent regulation in Switzerland followed the principle of comparable rents. Furthermore, index-linked rent increases and stepped rents were allowed since they followed the principles of fair rents (Bun-

desrat 6/2/1972, §§ 11–12). In addition, the security of tenure was enhanced. Landlords were not allowed to terminate a tenancy without having special reasons defined by law. Tenancies limited in time ended automatically at the end of the term. However, these measures were only applicable in regions with housing shortages. This was changed after long political debates in 1986. The act was adopted in 1987. Since then, the regulation holds for the whole Switzerland irrespective of housing shortages (Furrer, Vasella 2005; Rohrbach 2012).

In 1990 another great revision of private tenancy law took place when the former rules were integrated into the SCO (Huguenin, Arnold 2014, § 253). Substantial changes of private tenancy law, however, did not occur (Rohrbach 2012) and there were no significant changes of tenancy regulation. Swiss rent regulation still follows a system of fair rents. As for the security of tenure, the landlord may only give notice for several valid reasons such as non-payment of rents. Tenancies limited in time ends at the end of the period without the landlord having to give reasons.

United States

In contrast to European countries there is not such a rich tradition of regulation of private tenancy markets in the United States. However, there were times when private tenancies were strictly regulated nationwide. Especially during the Second World War private tenancies were controlled massively as a measure of national emergency. In the aftermath of the war the relaxation of housing shortages through construction lead to an abolishment of tenancy market regulation in the 1950s. Some cities like New York City almost maintained regulating private tenancies (Gilderbloom, Ye 2007; Autor et al. 2014).

In the 1970s a movement towards tenancy regulation emerged in several parts of the United States. The foremost strict rent control regimes were merely restricted to separate municipalities. In those years rent control laws had been enacted in over 170 municipalities, especially in the Northeast of the country and California (Keating, Kahn 2001). Most parts of the country's private residential rent market stayed, however, unregulated. Even during the peak of regulation in the 1970s only a minority of rented dwellings in the United States were regulated by a special

rent controlling law. The amount of controlled dwellings shrunk in the following decades due to a countermovement towards less regulated markets. Tenure security stayed low as in most parts of the United States (Dreier 1982). In the following, the regulation of rents and tenure security for California as the largest state and Massachusetts as an exemplary state in the northeast of the country will be analysed as a proxy for tenancy market regulation in the United States.

In California, rental market regulation came up during the 1970s when new construction was low and rents were constantly high. Several cities implemented rent regulating rules in the second half of the 1970s. Los Angeles - the largest city in California - introduced rent control in 1979. First, rents were frozen to their 1978 level for six months. After that, rent increases were limited to a yearly growth rate of 7.6 percent. In 1982, the growth rate was dropped to around 5 percent. However, several exceptions were installed such as vacancies decontrol or single-family house decontrol (Dreier 5/24/1997; Murray et al. 1988). Due to vacancy decontrol the fraction of controlled dwellings in Los Angeles constantly shrank in the following decades. In the rest of California rent regulation was installed in several municipalities at the end of the 1970s. But a trend of deregulation started in the late 1980s in California. New laws such as the Ellis Act from 1985 weakened the position of tenants in controlled dwellings. Nevertheless, the rent control system may have officially ended in 1995 when the Costa-Hawkins Rental Housing Act became law. The bill permits all cities to decontrol vacant dwellings. Under this act all the predominance of the strict rent control regimes in several municipalities in California (e.g. West-Hollywood or Berkeley) finally came to an end. As mentioned before, however, the decline of strict rent controlling regimes had already started in the 1980s in California (Dreier 5/24/1997; Keating, Kahn 2001).

Until today, tenure security for controlled dwellings has been high. Several reasons defined by law have to be fulfilled in order to evict a tenant at the end and during the period of payment. But for uncontrolled tenancies tenure security has been low. For those tenancies, durations on average are low since landlords just offer short time limited tenancies in order to avoid eviction

restrictions (Genesove 2003). If possible, landlords widely offer only those time limited tenancies in California and the whole of the USA. Today, this is by far the most common tenancy form in California. Landlords are not allowed to evict tenants without giving special reasons defined by law during the term of the tenancy but can do so at the end of the agreed term without giving reasons.

In Massachusetts rent control regimes were less robust and developed than in California. Here, rent control regimes were only in action in Boston, Cambridge and Brookline by 1979 and hence not as widespread as in California. As a consequence, rental market regulation did not play such a dominant role on the state-level in Massachusetts as in California. In Cambridge, the strictest rent control regime was implemented starting in 1970. The control regime was made up of tight rent level and rent increase ceilings. Furthermore, the transformation of rented dwellings to condominiums was restricted. However, newly constructed buildings were exempted from this rule in Cambridge (Dreier 5/24/1997; Autor et al. 2014). The Cambridge Rent Control Board limited rent increases for controlled dwellings in the late 1980s to 0.85 percent of the growth of consumption price inflation (Sims 2011). In Boston, a strict regulation of private tenancy was implemented in 1970 as well. However in 1975 a law was passed that deregulated controlled dwellings becoming vacant. Thus, the number of controlled rented dwellings shrank stepwise from 100.000 to 35.000 in 1983 (Dreier 5/24/1997). The rent decontrolled sector was regulated by a rent grievance system against excessive rent increases. In 1995, under the so-called question-9 campaign any form of rent control was abandoned in Massachusetts after a state referendum even though the fraction of controlled private tenancies was already low in 1995. In fact, less than 5 percent of all rented dwellings were controlled at that time (Dreier 5/24/1997). Today, regulation of tenancies is nearly non-existent in Massachusetts. Tenure security is therefore low and just guaranteed during the term of the tenancy.

5.2 Rent Control Regimes

THE RENT CONTROL REGIMES

US1 is Massachusetts/ Boston, US2 is California/ Los Angeles; First is First-generation rent control regime; A is 2nd-generation rent control regime A, B is 2nd-generation rent control regime B; C is 2nd-generation rent control regime C, D is 2nd-generation rent control regime D, free is free rent regime

	AUS	AUT	CAN	DEN	UK	FIN	FRN	GER	IRE	ITA	NED	NZL	NOR	SPA	SWE	SWI	US1	US2
1973 A	C	free	first	A	first	free	C	first	first	A	A	A	first	first	free	free	free	free
1974 A	C	free	first	A	first	free	C	first	first	A	A	A	first	first	free	free	free	free
1975 A	C	first	D	A	first	free	C	first	first	A	A	A	first	first	free	free	free	free
1976 A	C	first	D	A	first	first	C	first	first	A	A	A	first	first	free	free	free	free
1977 A	C	first	D	A	first	first	C	first	first	A	A	A	first	first	free	free	free	free
1978 A	C	first	D	A	first	first	C	first	B	A	A	A	first	first	free	free	free	free
1979 A	C	first	D	A	first	first	C	first	B	C	A	A	first	first	free	free	first	first
1980 A	C	first	D	C	first	first	C	first	B	C	A	A	first	first	free	free	first	first
1981 A	free	first	D	C	first	first	C	first	B	C	A	A	first	first	free	free	first	first
1982 A	free	first	D	C	first	first	C	free	B	C	A	free	first	first	free	free	first	first
1983 A	free	first	D	C	first	first	C	free	B	C	A	free	first	first	free	free	first	first
1984 A	free	first	D	C	first	first	C	free	B	C	A	free	first	first	free	free	first	first
1985 A	free	first	D	C	first	first	C	free	B	C	A	free	D	first	free	free	first	first
1986 A	free	C	D	C	first	B	C	free	B	C	D	free	D	first	free	free	first	first
1987 D	free	C	D	C	A	B	C	free	B	C	D	free	D	first	C	free	first	first
1988 D	free	C	D	D	A	B	C	free	B	C	D	free	D	first	C	free	first	first
1989 D	free	C	D	D	A	A	C	free	B	C	D	free	D	first	C	free	first	first
1990 D	free	C	D	D	A	A	C	free	B	C	D	free	D	first	D	free	first	first
1991 D	free	C	D	D	A	A	C	free	B	C	D	free	D	first	D	free	first	first
1992 D	free	C	D	D	A	A	C	free	B	C	D	free	D	first	D	free	first	first
1993 D	free	C	D	D	A	A	C	free	B	C	D	free	D	first	D	free	first	first
1994 D	free	C	D	D	A	A	C	free	B	C	D	free	A	first	D	free	first	first
1995 D	free	C	D	D	free	A	C	free	B	C	D	free	A	first	D	free	first	first
1996 D	free	C	D	D	free	A	C	free	B	C	D	free	A	first	D	free	first	first
1997 D	free	C	D	D	free	A	C	free	B	C	D	free	A	first	D	free	first	first
1998 D	free	C	D	D	free	A	C	free	free	C	D	free	A	first	D	free	first	first
1999 D	free	C	D	D	free	A	C	free	free	C	D	B	A	first	D	free	first	first
2000 D	free	C	D	D	free	A	C	free	free	C	D	B	A	first	D	free	first	first
2001 D	free	C	D	D	free	A	C	free	free	C	D	B	A	first	D	free	first	first
2002 D	free	C	D	D	free	A	C	free	free	C	D	B	A	first	D	free	first	first
2003 D	free	C	D	D	free	A	C	free	free	C	D	B	A	first	D	free	first	first
2004 D	free	C	D	D	free	A	C	B	free	C	D	B	A	first	D	free	first	first
2005 D	free	C	D	D	free	A	C	B	free	C	D	B	A	first	D	free	first	first
2006 D	free	C	D	D	free	A	C	B	free	C	D	B	A	first	D	free	first	first
2007 D	free	C	D	D	free	A	C	B	free	C	D	B	A	first	D	free	first	first
2008 D	free	C	D	D	free	A	C	B	free	C	D	B	A	first	D	free	first	first
2009 D	free	C	D	D	free	A	C	B	free	C	D	B	A	first	D	free	first	first
2010 D	free	C	D	D	free	A	C	B	free	C	D	B	A	first	D	free	first	first
2011 D	free	C	D	D	free	A	C	B	free	C	D	B	A	A	D	free	first	first
2012 D	free	C	D	D	free	A	C	B	free	C	D	B	A	A	D	free	first	first
2013 D	free	C	D	D	free	A	C	B	free	C	D	B	free	A	D	free	first	first
2014 D	free	C	D	D	free	A	C	B	free	C	D	B	free	A	D	free	first	first

Figure 5: The Rent Control Regimes

5.3 Robustness Analysis

	Model A1 Robust SE	Model A2 Clustered SE	Model A3 Clustered SE	Model A4 Robust SE	Model A5 Clustered SE	Model A6 Clustered SE
1st rent control regime	-0.034*** (0.008)	-0.034*** (0.008)	-0.037** (0.013)	-0.030*** (0.008)	-0.030** (0.011)	-0.035*** (0.012)
2nd rent control regimes						
Type-B	0.023* (0.013)	0.023** (0.008)	0.025*** (0.007)	0.016*** (0.006)	0.016*** (0.004)	0.017*** (0.005)
Type-ACD	-0.009 (0.007)	-0.009 (0.007)	-0.007 (0.009)	-0.004 (0.006)	-0.004 (0.006)	-0.005 (0.006)
Population	1.113 (0.724)	1.113 (0.656)	0.930 (0.738)			
House Prices	-0.021 (0.022)	-0.021 (0.037)	-0.032 (0.043)			
GDP per capita	0.224 (0.158)	0.224 (0.156)	0.254 (0.206)	0.109 (0.123)	0.109 (0.243)	0.016 (0.158)
Constant	-0.047*** (0.016)	-0.047*** (0.012)	0.004 (0.007)	-0.036** (0.016)	-0.036** (0.011)	0.013 (0.006)
Year Effects	YES	YES	NO	YES	YES	NO
Country Effects	YES	YES	YES	YES	YES	YES
Observations	690	690	690	430	430	430
Adjusted R ²	0.12	0.12	0.09	0.25	0.25	0.16

***= significant at the 1% level; **=significant at the 5% level; *=significant at the 10% level.

Figure 6: Robustness Check with Extra Variables

Note: The rent control regimes are discrete variables equal to one if the respective criterions are fulfilled. Robust standard errors and clustered standard errors are in parentheses. The dependent variable is the real rent growth rate. The models A1-A3 check for further control variables such as the year-on-year real house price growth rate and the year-on-year population growth rate. The models A4-A6 check for a smaller country sample where common law countries are excluded.

	Model A7	Model A8	Model A9	Model A10	Model A11	Model A12
	Robust SE	Clustered SE	Clustered SE	Robust SE	Clustered SE	Clustered SE
1st rent control regime	-0.024*** (0.008)	-0.024*** (0.006)	-0.026** (0.011)	-0.028*** (0.009)	-0.028*** (0.008)	-0.031* (0.015)
2nd rent control regimes						
Type-B	0.044** (0.022)	0.044** (0.015)	0.035* (0.019)	0.027 (0.020)	0.027* (0.015)	0.033*** (0.010)
Type-ACD	-0.001 (0.007)	-0.001 (0.008)	-0.003 (0.007)	0.004 (0.008)	0.004 (0.007)	0.001 (0.009)
GDP per capita	0.282 (0.147)	0.282 (0.155)	0.267 (0.183)	0.19 (0.191)	0.19 (0.126)	0.195 (0.168)
Constant	-0.049*** (0.013)	-0.049*** (0.016)	0.005 (0.005)	-0.062*** (0.011)	-0.062*** (0.010)	0.003 (0.007)
Year Effects	YES	YES	NO	YES	YES	NO
Country Effects	YES	YES	YES	YES	YES	YES
Observations	548	548	548	561	561	561
Adjusted R ²	0.11	0.11	0.06	0.13	0.13	0.08

***= significant at the 1% level; **=significant at the 5% level; *=significant at the 10% level.

Figure 7: Robustness Check 2

Note: The rent control regimes are discrete variables equal to one if the respective criterions are fulfilled. Robust standard errors and clustered standard errors are in parantheses. The dependent variable is the real rent growth rate. The models A7-A9 check for a smaller country sample where French law countries are excluded. The models A10-A12 check for a country sample where the Scandinavian legal origin countries are excluded.

	Model A13 Robust SE	Model A14 Clustered SE	Model A15 Clustered SE	Model A16 Simple SE	Model A17 Simple SE
1st rent control regime	-0.028*** (0.008)	-0.028*** (0.006)	-0.030** (0.012)	-0.030*** (0.006)	-0.022*** (0.005)
2nd rent control regimes					
Type-B	0.024* 0.013	0.024** 0.010	0.028** (0.001)	0.027*** (0.007)	0.021*** (0.007)
Type-ACD	-0.007 (0.008)	-0.007 (0.008)	-0.00 (0.010)	-0.002 (0.007)	0.002 (0.004)
GDP per capita	0.161 (0.154)	0.161 (0.150)	0.213 (0.158)	0.181*** (0.068)	0.167** (0.067)
Constant	-0.050*** (0.013)	-0.050*** (0.011)	0.004 (0.007)	0.006 (0.005)	0.004 (0.004)
Hausman test				chi2 (4) = 12.98 p-value = 0.0114	
Year Effects	YES	YES	NO	NO	NO
Country Effects	YES	YES	YES	YES	NO
Observations	597	597	597	712	712
Adjusted/ Within R ²	0.12	0.12	0.08	0.08	0.07

***= significant at the 1% level; **=significant at the 5% level; *=significant at the 10% level.

Figure 8: Robustness with Hausmann Test

Note: The rent control regimes are discrete variables equal to one if the respective criterions are fulfilled. Simple, robust and clustered standard errors are in parentheses. The dependent variable is the real rent growth rate. The models A13-A15 covers the estimations for a panel where German legal origin countries are excluded. The models A16 and A17 show the Hausman test analysis. A16 and A17 are estimated with the Stata command xtreg as specified in Stata.

	Model A18	Model A19	Model A20	Model A21	Model A22	Model A23
	Robust SE	Clustered SE	Clustered SE	Robust SE	Clustered SE	Clustered SE
1st rent control regime	-0.020*** (0.006)	-0.020*** (0.006)	-0.017*** (0.003)	-0.029*** (0.008)	-0.029*** (0.006)	-0.034** (0.012)
2nd rent control regimes:						
Type-B	0.023* (0.013)	0.026** (0.009)	0.023** (0.008)	0.038*** (0.013)	0.038* (0.022)	0.040* (0.021)
Type-ACD	-0.002 (0.006)	-0.002 (0.005)	-0.002 (0.007)	-0.001 (0.007)	-0.001 (0.007)	-0.002 (0.007)
GDP per capita	0.194 (0.141)	0.194 (0.151)	0.206 (0.164)	0.087 (0.130)	0.087 (0.128)	0.071 (0.110)
Constant	-0.002 (0.013)	-0.002 (0.015)	0.007 (0.005)	-0.049*** (0.011)	-0.049*** (0.011)	0.009 (0.006)
Year Effects	YES	YES	NO	YES	YES	NO
Country Effects	YES	YES	YES	YES	YES	YES
Observations	641	641	641	606	606	606
Adjusted R ²	0.04	0.04	0.04	0.17	0.17	0.11

***= significant at the 1% level; **=significant at the 5% level; *=significant at the 10% level.

Figure 9: Robustness Check with Other Starting Year

Note: The rent control regimes are discrete variables equal to one if the respective criterions are fulfilled. Robust standard errors and clustered standard errors are in parantheses. The dependent variable is the real rent growth rate. The models A18-A20 covers the estimations for a panel that starts in 1979. The models A21-A23 shows the estimations results for a panel that end already in 2008

