RESH Discussion Papers

No. 10 / 2023

Tobias A. Jopp/Mark Spoerer

Civil Aircraft Procurement and Colonial Ties: Evidence on the Market for Jetliners, 1952-89

Universität Regensburg
FAKULTÄT FÜR PHILOSOPHIE,
KUNST-, GESCHICHTS- UND
GESELLSCHAFTSWISSENSCHAFTEN

REGENSBURG ECONOMIC AND SOCIAL HISTORY (RESH)

Discussion Paper Series

Edited by

Prof. Dr. Mark Spoerer and PD Dr. Tobias A. Jopp

Processed by

PD Dr. Tobias A. Jopp

University of Regensburg

Faculty of Philosophy, Art History, History and Humanities

Department of History

Chair for Economic and Social History

The RESH Papers are intended to provide economic and social historians and other historians or economists at the University of Regensburg whose work is sufficiently intersecting with economic and social history with the possibility to circulate their work in an informal, easy-to-access way among the academic community. Economic and social historians from outside the University of Regensburg may also consider the RESH Papers as a means to publish informally as long as their work meets the academic standards of the discipline. Publishable in the RESH Papers is the following: *Work in progress* on which the author(s) wish to generate comments by their peers before formally publishing it in an academic journal or book; and English translations of already published, yet *non-English* works that may be of interest beyond the originally targeted (German, French, and so on) audience. Authors interested in publishing in the RESH Papers may contact one of the editors (Mark.Spoerer@ ur.de; Tobias.Jopp@ur.de).

Cover page photo: Fokker F28 Fellowship PK-GVH of Garuda Indonesia at Singapore Airport in 1974. Source: https://upload.wikimedia.org/wikipedia/commons/9/9d/Fokker_F.28_PK-GVH_Garuda_SIN_14.09.74_edited-3.jpg . Final page photos: Own material.

Civil Aircraft Procurement and Colonial Ties: Evidence on the Market for Jetliners, 1952-1989

Tobias A. Jopp / Mark Spoerer[+]

Abstract: We investigate the extent to which (quasi-)colonial ties played a role in the procurement of jet aircraft by airlines in the Global South. Because we do not have access to archival data on the sensitive issue of aircraft procurement, we take an indirect empirical approach. Our investigation is based on a dataset including all Western jet aircraft delivered between 1952 and 1989. We ask if, to what extent and how long airlines from former British, French, Dutch, and US (quasi-)colonies tended to buy jets from their former or, respectively, most recent colonial master. We compare the (ex-ante) expected geographical distribution of politically unbiased jet deliveries to the (ex post) actual historical and potentially biased distribution. We find that colonial ties to former colonial masters from Europe especially mattered until the early/mid 1970s when, triggered by the two oil price crises, pure economic motives gained more significance in informing procurement decisions.

Keywords: Civil Aircraft Procurement, Colonial Legacy, Global South

JEL classification: F55, N60, N70, R41

[+] Contact 1 (corresponding author): Tobias A. Jopp, University of Regensburg Department of History, Economic and Social History, 93040 Regensburg; email: tobias.jopp@geschichte.uni-regensburg.de. Contact 2: Mark Spoerer, University of Regensburg Department of History, Economic and Social History, 93040 Regensburg; email: mark.spoerer@geschichte.uni-regensburg.de.

Civil Aircraft Procurement and Colonial Ties:

Evidence on the Market for Jetliners, 1952-1989

1. Objective and outline

From its beginnings until at least the 1970s, civil aviation was highly politicized, and even today the two most important aircraft manufacturers, Airbus and Boeing, accuse each other of improper government aid. The development of a commercial aircraft has been an extremely costly endeavour ever since and is, ultimately, only profitable if several hundreds of them can be sold, especially abroad. Since, in addition to technology- and labour-related policy motives, national prestige also plays a role in aircraft manufacturing, it is not surprising that governments have repeatedly tried to support the export efforts of national manufacturers.[1] In fact, the incentives for manufacturers and governments – especially if manufacturers are government-owned – to try sell an expensive product by capitalizing on political ties and, therefore, circumventing the market mechanism should be huge.[2]

If political pressure plays a role in the sale of aircraft, it stands to reason that this is particularly important in relation to (former) colonies. However, when investigating the market for wide-body aircraft, Jopp and Spoerer (2023) find no statistically robust evidence of a positive colonial bias for the period from 1969 (market launch of the first wide-body aircraft, the Boeing 747) to 1989. Three hypotheses can be put forward to explain this finding (the first two are not necessarily mutually exclusive). Firstly, the colonial past could have led the decision-makers with the airlines and governments to consciously orient themselves differently, that is, they preferred aircraft not produced in the former colonial master country. Secondly, there might have been technological path dependencies before the decision for or against the purchase of certain wide-body jets, which then overcompensated for any (post-) colonial (positive or negative) preferences. For example, those airlines already operating an almost all-Boeing narrow-body fleet would possibly choose the Boeing 767 rather than the Airbus A300.[3] Third, and finally, irrespective of any colonial dependencies and technological and customer-

[1] See Higham (1965), Jönsson (1981), pp. 278-279, Mowery/Rosenberg (1982), Edgerton (1984), Francis/Pevzner (2006), pp. 633-636, Jaworski/Smyth (2016), Hayward (2018), Ahrens (2020), and Fauri (2021).

[2] See Jopp/Spoerer (2021) for a simple model of thought of what establishes a political aircraft sale.

[3] E.g., LAN Chile in 1986 or Avianca (Colombia) in 1990.

relations path dependencies, each new model on the market was evaluated anew for its economical usage and for whether it would fit the existing fleet.

To clarify these issues, it is important to look even further back and ask whether colonial or technological dependencies played a role before the era of wide-body jets. This is the focus of this article. For all Western jet types, we examine to which first-hand customers aircraft manufacturers sold their brand-new aircraft. In a first step, we look at whether aircraft were sold disproportionately to (former) colonies, i.e., whether there was a positive colonial bias before 1969; and we argue that there was one. Therefore, in a second step, we clarify when this positive colonial bias lost its significance and which of the above-mentioned reasons apply.

In our view, answering the question for the role of colonial ties or, more generally, political pressure in shaping historical aircraft procurement decisions requires going beyond case studies dominating the literature. As we do not have access to archival data on the sensitive issue of aircraft procurement, we instead pursue an empirical, mass data approach. To this end, we collected data on every Western jet delivered between 1952 and 1989. After having placed our study in the relevant literature in Section 2, we describe our dataset in more detail in Section 3. In Section 4, we discuss some noteworthy historical trends in the data as to the role of first-hand customers from the Global South (where most of the Western countries' actual and former colonies lie) as jet aircraft procurers. In Section 5, we present our results, limiting ourselves to methods of descriptive statistics. Finally, Section 6 concludes. The Appendix provides supplementary material.

2. Placing the study

Our analysis links with two bodies of literature. The first comprises the many studies produced by economists, economic historians, political historians, and political scientists on decolonization processes and post-colonialism. This literature has provided ample evidence that past colonial relations have been in many cases significant for long after colonies gained their formal independence.[4] For example, in his 1978 study, Smith concluded that

[4] See Strang (1990, 1991), Alemazung (2010), Austin (2010), Lee/Schultz (2012) and Pearson (2017). See Maseland (2018) for a critical view on this notion.

> […] the Europeans could nevertheless significantly influence this process [i.e., the decolonization process; the authors] in most cases by their attention to grooming their successors. For virtually every nationalist government harbored a civil war whose divisions allowed the colonial authority a strong voice in local affairs. By deciding with whom they would negotiate, by what procedure they would institutionalize the transfer of power, and over what territory the new regime would rule, Paris and London decisively influenced the course of decolonization.[5]

In regards of British colonial legacy specifically, Lange (2004) provides evidence on institutional path dependencies reaching from colonial rule well into the post-colonial era.[6] In addition, other authors clearly suggest that a former colonial master would have wanted to take part in shaping a former colony's future to defend its own economic and security interests in the first place.[7] For Africa's air transport sector, Button et al. (2015) provide statistical evidence that colonial legacy indeed shaped its long-term development.[8]

One way in which a former colonial master could exert influence, if not outright pressure, to pursue national interests may be seen in establishing financial leverage through all sorts of financial flows, especially foreign aid. According to McKesson (1990), for example, France was "the major foreign player on the African scene" around the late 1980s, evidenced by a share in foreign aid to sub-Saharan Africa of 18 per cent, outranking every other donor country or supranational donor organization.[9] Considering the findings from the various economic and political science studies that ask for the motives of donor countries to provide foreign aid, France's motive, very likely, was to serve its own economic and security interests rather than acting out on an altruistic streak.[10] To name only one study, Alesina and Dollar (2000) establish colonial ties as one important statistical determinant of foreign aid flows; former colonial masters tend to provide more foreign aid to its former colonies than to other potential receivers.[11] Another way of preserving influence was integrating former colonies in

---

[5] Smith (1978), p. 100.

[6] See Lange (2004), p. 905.

[7] For the US, see Zevin (1978). For France, see Martin (1985, 1995), Staniland (1987), McKesson (1990), Chafer (1992), and Bourmaud (1995). For Britain, see White (2000), Hopkins (2008), Carrick (2013). For the Netherlands, see Adiputri (2014).

[8] See Button et al. (2015), pp. 636-637.

[9] McKesson (1990), p. 34.

[10] See Imbeau (1989), Lumsdaine (1993), Schraeder/Taylor/Hook (1998), Grier (1999), Alesina/Dollar (2000), and Berthélemy (2006).

[11] See Alesina/Dollar (2000), pp. 33, 39-40, 45-46.

a political or economic superstructure controlled by the former colonial master. The CFA-Franc zone may be viewed as such a structure as well as may the Commonwealth of Nations.[12]

Following Jonsson (1981), four major motives for government intervention have been uniquely coming together in the aviation industry, namely "national defense", "economic considerations", "safety", and "foreign policy considerations" – i.e., national prestige ("showing the flag").[13] The aviation industry may therefore be seen as the paragon of a highly politicized economic sector. Thus, it is well imaginable that (former) colonial masters like Britain, France, the Netherlands, and the United States, each commanding over a potent commercial aircraft industry in this study's observation period, viewed (former) colonies as their exclusive marketing zones providing unrivalled demand for their produce. We like to think these are the perfect ingredients into a situation characterized by frequent "political sales" like defined in Jopp and Spoerer (2021) and to be seen in comparison to market-mechanism-based sales guided by economic motives of the aircraft procurer in the first place;[14] particularly so when considering that corruption seems to be a special, persistent issue with former colonies,[15] very much like with the aircraft industry.[16]

At this point, the second body of literature comes into play which is directly concerned with the birth and rise of the commercial aircraft and airline industries and which may, or may not, provide historical evidence on the matter. Notably, in the grand narratives, which are built around the various steps of regulation having shaped commercial aviation to date, the issue of colonial ties and the consequences for aircraft procurement and production decisions is largely neglected. An instructive example is Dobson's narrative, in which there is only one mention of the terms "colony" and "colonialism" each and no mention of the term "decolonization", at all.[17] The political dimension of selling aircraft is more present in the specialized works on single aircraft manufacturers and particularly on the rivalry between Boeing and

[12] See Van der Walle (1991) and Taylor (2019) on the CFA-Franc zone and Lundan/Jones (2001) and Robertson/Singelton (2001) on the Commonwealth.

[13] See Jonsson (1981), pp. 278-279.

[14] See Jopp/Spoerer (2021), paragraphs 11-15.

[15] See Angeles/Neanidis (2015) on colonialism and corruption.

[16] See "Airbus's secret past", *The Economist*, June 12, 2003, and "Airbus agrees to pay a huge fine to settle a bribery case", *ibid*., January 31, 2020.

[17] See Dobson (2017), pp. 28, 60. The same goes for Newhouse (1983), Hayward (1994) and Sakade (2022) who do not address the issue at all.

Airbus, culminating in several subsidy disputes between the US and the European Union.[18] However, in this literature as well as other manufacturer-, country, or airline-centred historical narratives, the question of how many sales deals were politically induced, that is, decidedly circumvented the market mechanism for the manufacturer's benefit, is addressed, at best, at the very surface. The same goes for the colonial ties issue, specifically.[19] Our approach is geared at filling this knowledge gap to some extent.

3. Dataset and methodological issues

Aviation still attracts many enthusiasts, so that for practically every commercial aircraft ever flown information on the complete chronology of owners, that is, from the first customer to purchase the brand-new aircraft to the last operator buying it second-hand and eventually retiring it one way or the other (by scrapping, preserving, or write-off), is available somewhere on the internet. While for some types of aircraft, we directly consulted publications reporting production lists[20], we mostly drew on several online databases.[21]

From these databases, we have collected information on every commercial jet aircraft produced and delivered between 1952 and 1989 that was not of Soviet design.[22] Table 1 provides an overview of all 24 types of jet aircraft in our dataset. Given are the type of aircraft and manufacturer in column one; the manufacturer's home country in column two; the market segment in column three; the period of delivery in column four; the number of cumulated deliveries until and including 1989 in column five; and the number of different first-hand customers by type in column six.

[18] On the Airbus-Boeing trade dispute, see e.g. McGuire (1997), Pavcnik (2002), Hayward (2005), and Wittig (2021). See Jopp/Spoerer (2021) for a deeper discussion of this literature.

[19] See Simonsen (1960), Hayward (1989), McCormack (1989), Dierikx (1991), pp. 333-334, Mlambo (1992), Devereux (1995), Amankwah-Amoah/Debrah (2014), Soland (2019), Nthenya/Donzé (2021), Devereux (2021), and Huber (2022). See Button/Martini/Scotti (2015) for a study focusing on Africa as a whole.

[20] See Lynn (1976) and Roach/Eastwood (1997).

[21] See https://rzjets.net/aircraft/, https://www.planespotters.net/production-list/index/, http://www.airfleets.net, and https://planelogger.com.

[22] With very few exceptions, no airline outside the Soviet-controlled bloc purchased Soviet-designed (jet) aircraft. Put otherwise, one could argue that no aircraft producing country relied as much on quasi-colonial ties (for the concept, see below) as the Soviet Union.

Table 1: Dataset on first-hand customers of Western-type jetliners delivered until 1989

Manufacturer/Aircraft type[a]	Country	Segment[b]	Observed over	Cumulated deliveries[c]	Number of first-hand customers[d]
De Havilland DH. 106 Comet	UK	NB(m)	1949–1967	110[f]	16
Boeing B707/720	US	NB(m)	1958–1989	983[g]	69
Douglas DC-8	US	NB(m)	1959–1972	556	38
Sud Aviation Caravelle	France	NB(m)	1959–1973	279	37
Convair CV-880/CV-990	US	NB(m)	1960–1965	102	17
Hawker Siddeley Trident	UK	NB(m)	1963–1978	117	9
Boeing B727	US	NB(m)	1963–1984	1,831	97
BAC Vickers VC10	UK	NB(m)	1964–1970	54	5
BAC 1-11	UK	NB(m)	1965–1989	240[h]	46
Douglas DC-9/MD80	US	NB(m)	1965–1989	1,654	100
Boeing B737	US	NB(m)	1967–1989	1,795	166
Boeing B747	US	WB	1969–1989	755	74
Fokker F28/F100	Netherlands	NB(r)	1969–1989	273	62
McDonnell-Douglas DC-10	US	WB	1971–1989	446[g]	52
Lockheed L-1011	US	WB	1972–1985	249	20
Dassault Mercure	France	NB(m)	1974–1985	11	1
Airbus A300	FR/GE/SP/UK[e]	WB	1974–1989	321	47
Aérospatiale-BAC Concorde	FR/UK	NB(m)	1975–1980	14	2
VFW 614	Germany	NB(r)	1975–1985	14	5
Boeing B757	US	NB(m)	1982–1989	255	34
Boeing B767	US	WB	1982–1989	283[i]	35
Airbus A310	FR/GE/SP/UK[e]	WB	1983–1989	163	30
British Aerospace BAe 146	UK	NB(r)	1983–1989	142	33
Airbus A320	FR/GE/SP/UK[e]	NB(m)	1988–1989	74	13
Total narrow-body			*1952–1989*	*8,504*	*436*
Total wide-body			*1969–1989*	*2,217*	*145*
Total industry			*1952–1989*	*10,721*	*458*

Notes: [a] Sorted by first delivery year. [b] NB(m) = narrow-bodies mainline; NB(r) = narrow-bodies regional; WB = wide-bodies. [c] Testbeds/prototypes remaining with the manufacturer excluded. [d] The sum total of first-hand customers does not equal the sum over the sub-entities due to double counts. [e] FR = France, GE = Germany, SP = Spain, UK = UK. [f] Commissioning is usually dated 1952; however, two jets were delivered to the UK government before, one in 1949 and one 1950. [g] Military air tankers included. [h] Including the ROMBAC 1-11. [i] A revision of our original wide-body aircraft database for 1969-1989 (Jopp/Spoerer 2021, 2023) leads to a rise in the number of aircraft by two.

Sources: See text.

In total, according to our count, 10,721 jets were delivered to 458 different first-hand customers (including but not limited to commercial passenger and cargo airlines) in the observation period, thereof 8,504 narrow-bodies, most of which may be reasonably seen as designed to

serve mainline routes according to the aviation literature, and 2,217 wide-bodies, appearing on the scene with the first deliveries of the Boeing 747 in 1969.[23] In fact, our dataset is covering the entire pre-1990 first-hand market for Western jet aircraft.

To be precise, the dataset created for the purpose of this paper is an extension of our dataset on wide-body jet aircraft introduced in Jopp and Spoerer (2021, 2023) for the much larger narrow-body segment. For the baseline variables created per wide-body jet and subsequently also for each narrow-body jet, we kindly refer the reader to the overview in Jopp and Spoerer (2021). The information per jet we do need for this analysis is the following: (1) manufacturer (e.g., Boeing), type (B707, B727, and so on) and market segment (e.g., narrow-body mainline); (2) the delivery year (e.g. 1970); (3) the first-hand customer (e.g., American Airlines or Dutch government) and its home country (e.g., the United States of America and, respectively, the Netherlands);[24] (4) whether the first-hand customer's home country belonged to the Global South during the observation period (0-1-coded dummy variable);[25] (5) whether it was a (former) colony of either Britain, France, the Netherlands, or the US (0-1-coded dummy variables), which are the relevant manufacturer countries; or (6) whether it lay in Latin America and, thus, establishes what we call a quasi-colony of the US (0-1-coded dummy variable), relating to the agenda that was set by the Roosevelt Corollary of 1904.[26] In a few cases, we also identified quasi-colonies to Britain.

Assigning countries to the Global South and Global North and deciding whether a country was a (former) colony, and to which colonial master, needs explaining. We placed a country in the Global South if it was part of the "Group of 77" (G77 in shorthand) founded as a country subgroup at the United Nations in 1964.[27] Originally, the group had 77 founding members and has meanwhile expanded to 134.[28] For the sake of convenience, we assigned the G77-status

[23] While 458 different first-hand customers identified by us may sound quite a many, the distribution by the number of procured aircraft per customer is extreme skewed to the right. Taken together, the 30 largest customers (with American Airlines in the lead) alone procured 60 per cent of all brand-new jets. In comparison, the 200 smallest customers were responsible for just 3.1 per cent.

[24] In case a first-hand customer reflects a conglomerate of several countries (like, e.g., Air Afrique or Scandinavian Airlines System), we chose the home country to be the one hosting the headquarters.

[25] This variable is not in our original wide-body dataset and has thus been newly created for both wide- and narrow-bodies.

[26] See Connell-Smith (1976), Mitchener/Weidenmier (2005), and Ricard (2006).

[27] On the foundation of the "Group of 77", see Kunkel (2012) and Toye (2014).

[28] Members as of right now are reported on the group's website; see www.g77.org/doc/members/.

to all countries in our list that are to be found among the actual G77 members; and, for the sake of illustration, we assigned the status right back to the first jet delivery in 1952. By definition, a country not classified as belonging to the G77, was placed in the Global North unless it had membership status before 1990 and left the group sometime in-between.[29]

As for the classification as colony, the composition of our dataset by manufacturer home country predetermined which historical relationships between a (former) colonial master and a (former) colony to put under scrutiny. For technical reasons, we considered it helpful, if not necessary, to classify a country as a (former) colony of exactly one other country – the colonial master, either Britain, France, the Netherlands, or the US. To accomplish an unambiguous classification (which may not properly accommodate each and every country's specific colonial history), we focused on a target country's most recent colonial ties before formal independence[30], and generally on recent ties reaching back not farer than the mid-nineteenth century.[31] Our classification also considers overseas territories (e.g., New Caledonia belonging to France), protectorates, and mandate areas assigned by the United Nations (e.g., France's mandate over Lebanon and Syria between 1920 and the late 1940s).

Beyond formal colonies we also consider Latin American countries including the Caribbean to have been sort of quasi-colonies to the US based on the idea that was put forward in the Roosevelt Corollary of 1904 as an amendment to the Monroe Doctrine. At face value, in terms of the actual policy implication, Latin America was established as the US's political and economic backyard, in which to intervene the US would have all justification.[32] Therefore, it seems reasonable to take this perspective into account, too. Note that introducing quasi-colonies does unavoidably establish ambiguity as to the number of different colonial masters a country could have had, which rises to two in that world region. Therefore, if a country in Latin America (including the Caribbean) had had formal colonial ties to Britain, France, or the Netherlands, we attribute a jet of one of its first-hand customers to the respective colony of one of these three countries and not to the quasi-US -colonies (formal colony before quasi-colony);

[29] Countries in our dataset that today are considered to belonging to the Global North, but were members of the G77 before 1990, are Cyprus, Malta (since 1976), Mexico, Romania (since 1976), South Korea, and Yugoslavia; see https://en.wikipedia/org/wiki/Group_of_77/. We do count these countries as belonging to the Global South, too.

[30] This criterion rules out Spain (Airbus) and Germany (VFW, Airbus) as potentially relevant colonial masters.

[31] This criterion rules out the United States as having colonial ties with Britain.

[32] See Connell-Smith (1976), Mitchener/Weidenmier (2005), and Ricard (2006).

e.g., we link the jets procured by British West Indian Airways International with (former) colonial ties to Britain, although the airline's home country, Trinidad and Tobago, well lies in the sphere of influence of the US. Note that Britain is the only colonial master with colonies in both the Global South and Global North.

Nauru, Papua-New Guinea, Samoa, Nepal, and Afghanistan establish special cases of countries that appear in our dataset and that we classify as quasi colonies of Britain. Nauru and Papua-New Guinea were mandate areas of Australia and Samoa of New Zealand before becoming independent. Since, in turn, we count Australia and New Zealand as countries with close colonial ties to Britain, we deem it possible that Britain could exert indirect influence on them via Australia and New Zealand. Furthermore, Nepal and Afghanistan had never been under formal British colonial rule but their politico-military ties to Britain seem to have been quite close well into the twentieth century, so that taking both as quasi-colonies of Britain seems reasonable to us.[33]

Summarizing our assignment process, Table A.1 in the Appendix lists the countries we consider having had a recent (quasi) colonial history with the aircraft manufacturers' home countries. Beside the country and (former) colonial master, we report the country group (Global South or North), the date of independence from colonial rule, and the year in which the first brand-new jetliner was procured by an operator from the respective country.

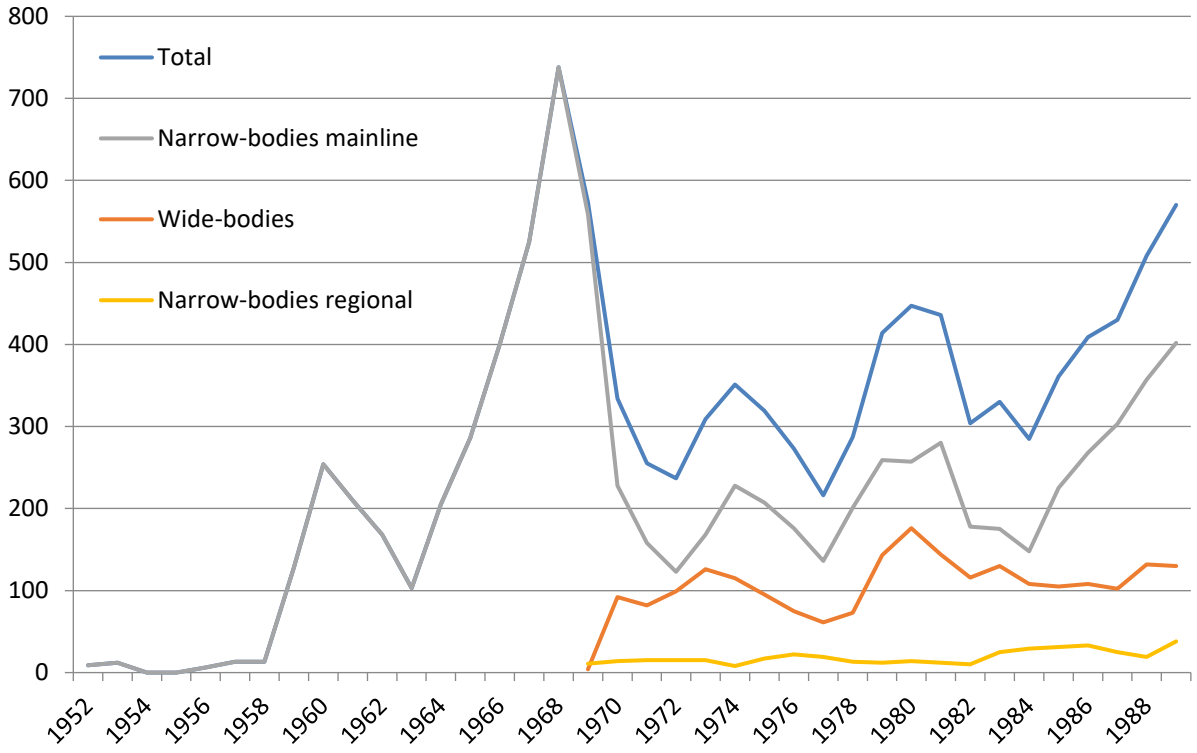
4. Assessing some trends

In this section, we want to briefly review some trends as to jet aircraft procurement in the Global South and the Global North. To begin with, Figure 1 illustrates the overall trend in deliveries of Western-type jets by market segment in our observation period. Clearly visible is the strong rise in the first phase of the market ending in the late 1960s. Narrow-body jets were state of the art in the 1950s and 1960s and experienced a nearly uninterrupted boom initially. When wide-bodies entered the market in 1969, the market for narrow-bodies was saturated for the moment; their sales were plummeting and recovered only in the second half of the 1980s. There is no doubt that the two oil price shocks of the 1970s and early 1980s heavily influenced airlines' and other operators' procurement decisions.[34]

[33] However, excluding Nepal and Afghanistan would not change our results significantly since airlines from these countries bought a mere six jets in the observation period (five narrow-bodies and one wide-body).

[34] On the effects of the oil price crises on commercial aviation, see e.g. Argiropoulos (1982).

Figure 1: Annual deliveries of brand-new Western-type jetliners by segment, 1952-1989



Notes: On the composition of the segments, see Table 1.

Sources: Authors' dataset; see Section 2.

The first oil price crisis in 1973/74 brought about a doubling of the price for kerosene, a rise markedly surpassed by the crisis in 1981 with an almost ten-fold increase compared to the start of 1973. Consequently, total jet sales dropped, and the production of kerosene-thirsty jet types such as the Caravelle, the Trident, and the supersonic airliner Concorde was stopped; especially for the latter, France's and Britain's prestige project, there had not been demand for brand-new jets from airlines other than Air France and British Airways. Airlines operating the Boeing 720 and the Convair Coronado threw their aircraft on the secondary market, where they found demand located in the periphery, at best, or retired them straight away. As for the wide-body segment, the first types of aircraft to heavily lose in significance due to fuel inefficiency were the triple-engined aircraft, Lockheed's Tristar and McDonnell Douglas's DC-10. Because Lockheed did not find new customers for its Tristar, production finally ceased in 1985. Jets offering more favourable fuel consumption per passenger profited, like Airbus's A300 and

later Boeing's B767. In addition, the FAA eased ETOPS regulations, allowing twin-engine jets to cross the North Atlantic for commercial flights beginning in 1985.[35]

Figure 2 breaks down the overall number of deliveries by segment into brand-new jets delivered to the Global North and the Global South; while Panels (a) and (c) show the absolute figures for narrow-body and wide-body aircraft like in Figure 1, Panels (b) and (d) report the Global South's percentage share in both segments. The very first jetliner to be delivered to a commercial customer was the De Havilland DH-106 Comet I with registration G-ALYS, bound for British Overseas Airways Corporation (BOAC) and delivered on 4 February 1952. 51 more aircraft – 40 Comets and 11 Boeing B707 – had been delivered until early in 1959, before the first operator from the Global South saw its first delivery of a brand-new jet. This was a Comet IV (reg. LV-PLM) handed over to Aerolineas Argentinas on 27 January 1959. The Argentinian flag carrier received another two Comets that year (in March and May), followed by VARIG from Brazil as the Global South's initial first-hand customer of the Sud Aviation Caravelle III (two jets delivered in mid-September and early December). For the sake of completeness, the very first jet delivered to an operator from the Global North that had a formal colonial background with the manufacturer's home country was a Comet I, and the operator was Canadian Pacific Air Lines (CP Air) to which the jet (reg. CF-CUN) was handed over on 2 March 1953.[36]

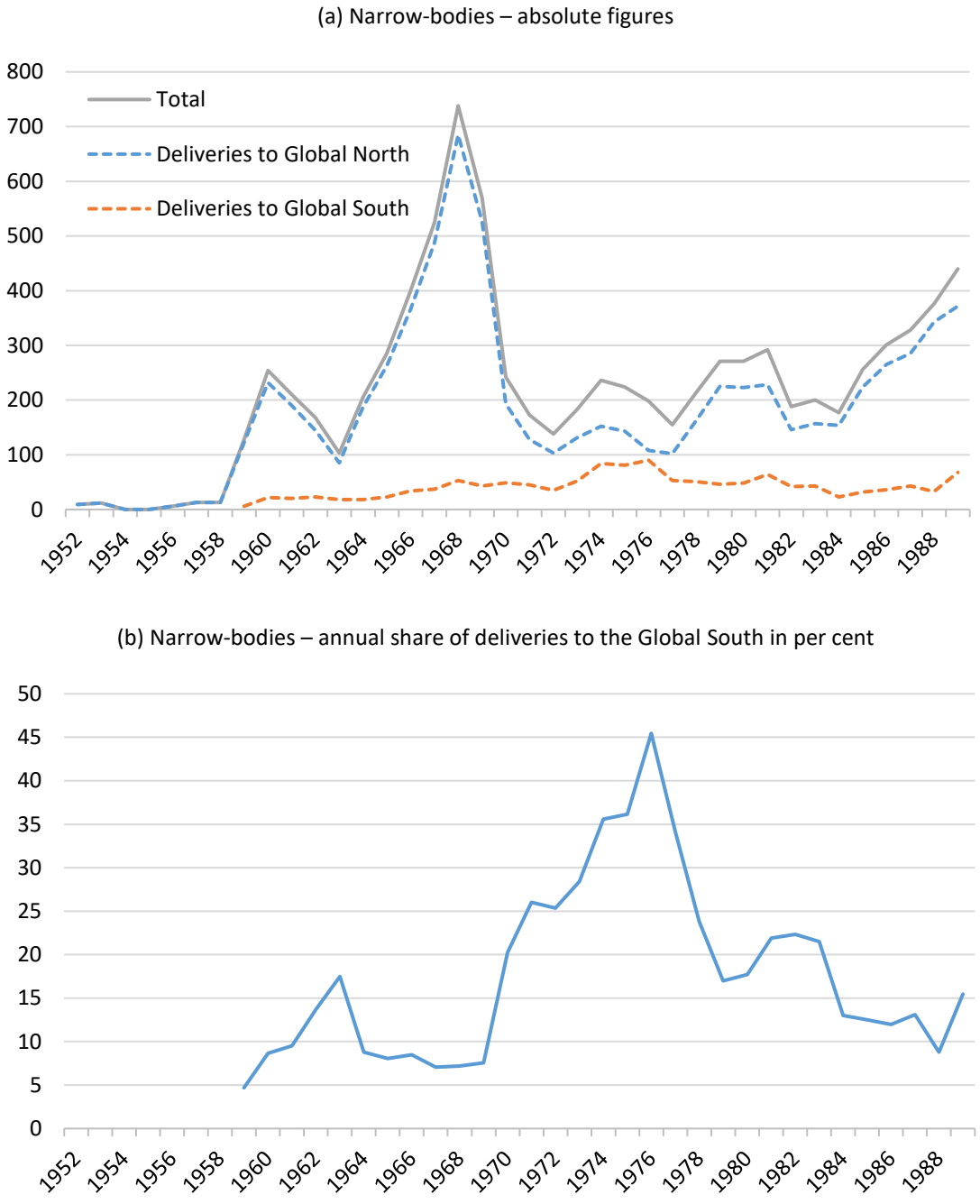
As follows from Figure 2, Panel (a), jetliner deliveries to the Global South peaked in 1976 (90 jets), right between the two oil price crises, and then followed a downward trend. In the late 1980s, a reversal loomed at the horizon. Expressed in a percentage, first-hand customers from the Global South accounted for roughly half the effective market for narrow-bodies on the peak in the mid-1970s; that percentage would shrink to around 15 per cent in 1989. The picture for the wide-body-segment is different and especially owes to the growth of four airlines, namely Singapore Airlines (SIA), Saudia, Korean Air Lines, and Thai Airways. The peak-year was 1980 with 56 jets delivered, accounting for 32 per cent of the effective market. Interestingly, when focusing entirely on the percentages, wide-body deliveries to the Global South also peaked in 1976, with an effective market share of around 43 per cent. In the following years, as with narrow-bodies, deliveries followed a less steeply declining trend. It

[35] See DeSantis (2013).

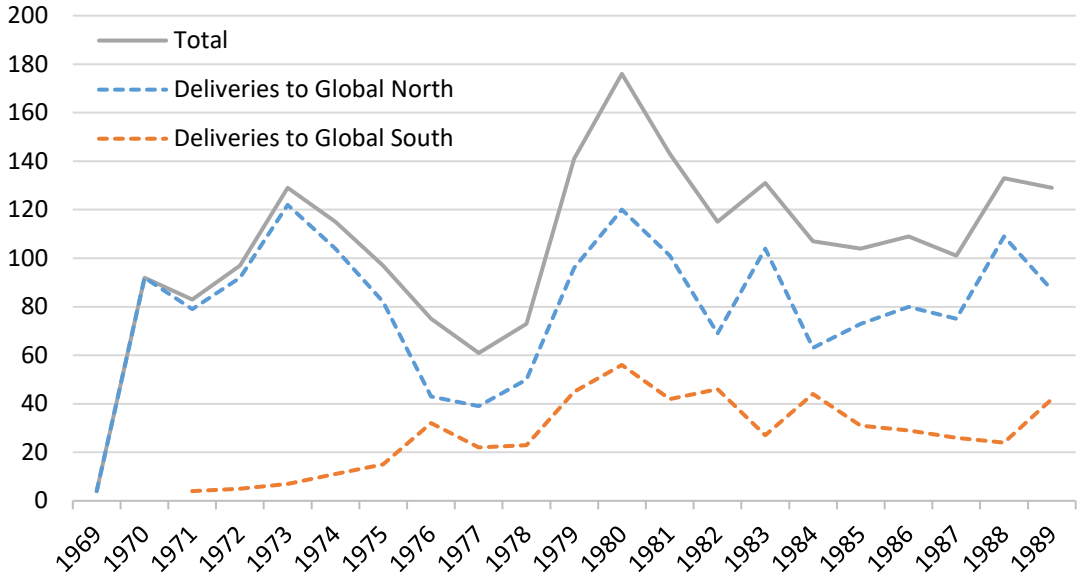
[36] Operators, dates, and registries follow from our database.

seems that, in relative terms, airlines from the Global South were more important to the principal aircraft producers as consumers of wide- than of narrow-bodies.

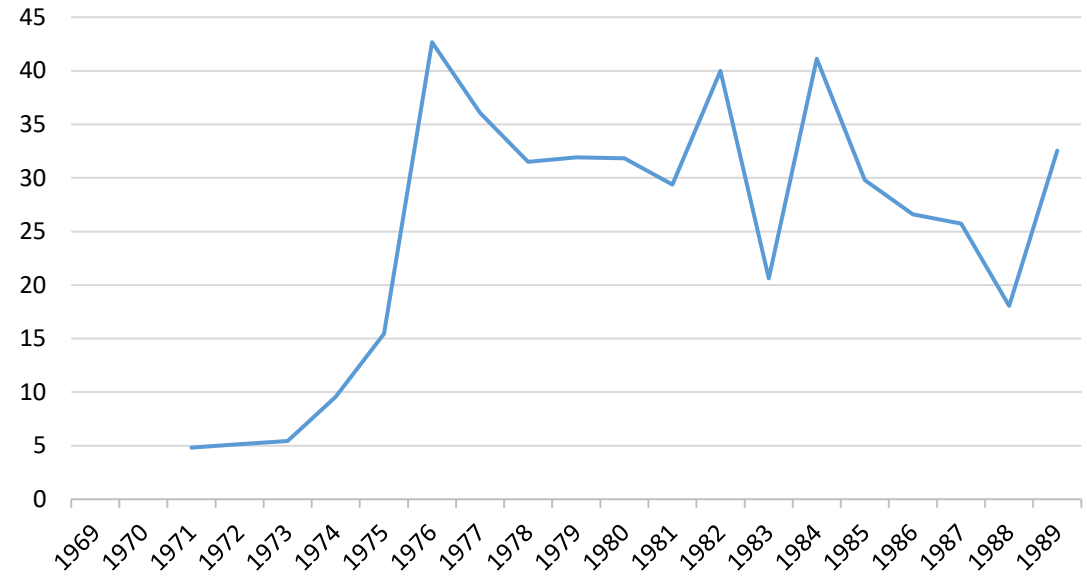
Figure 2: Annual deliveries of brand-new jetliners to operators from the Global South and Global North by segment, 1952-1989



(c) Wide-bodies – absolute figures



(d) Wide-bodies – annual share of deliveries to the Global South in per cent



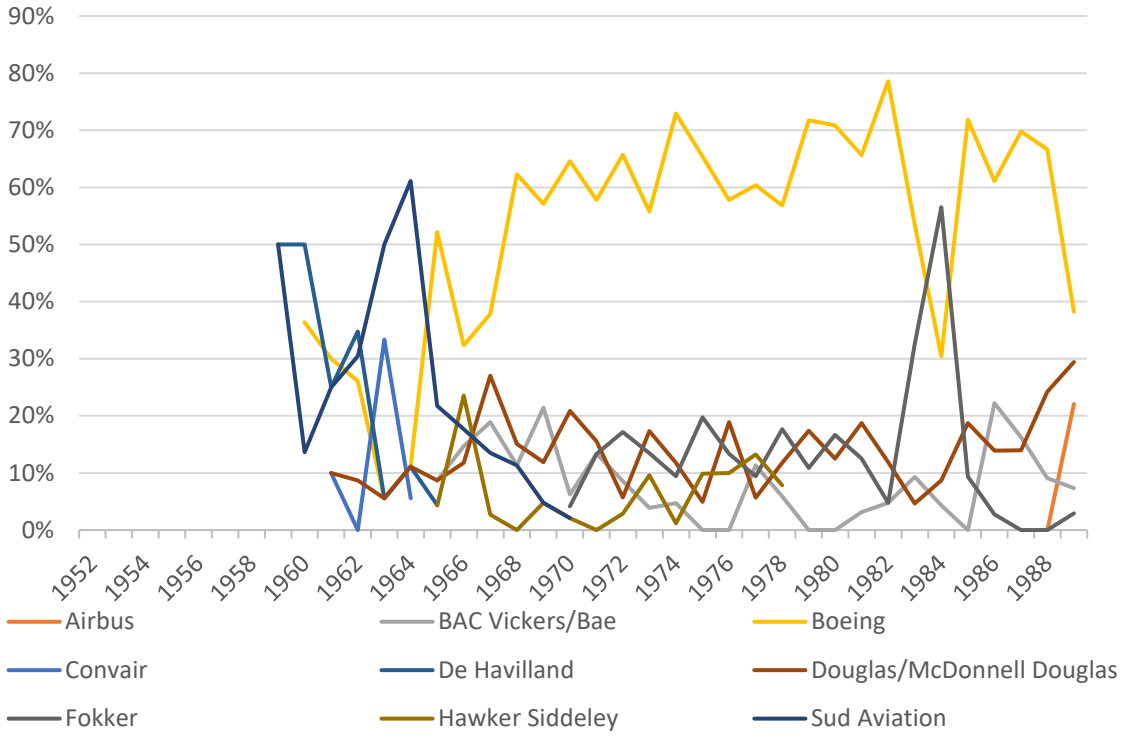
Notes: On the composition of the segments, see Table 1.

Sources: Authors' dataset; see Section 3.

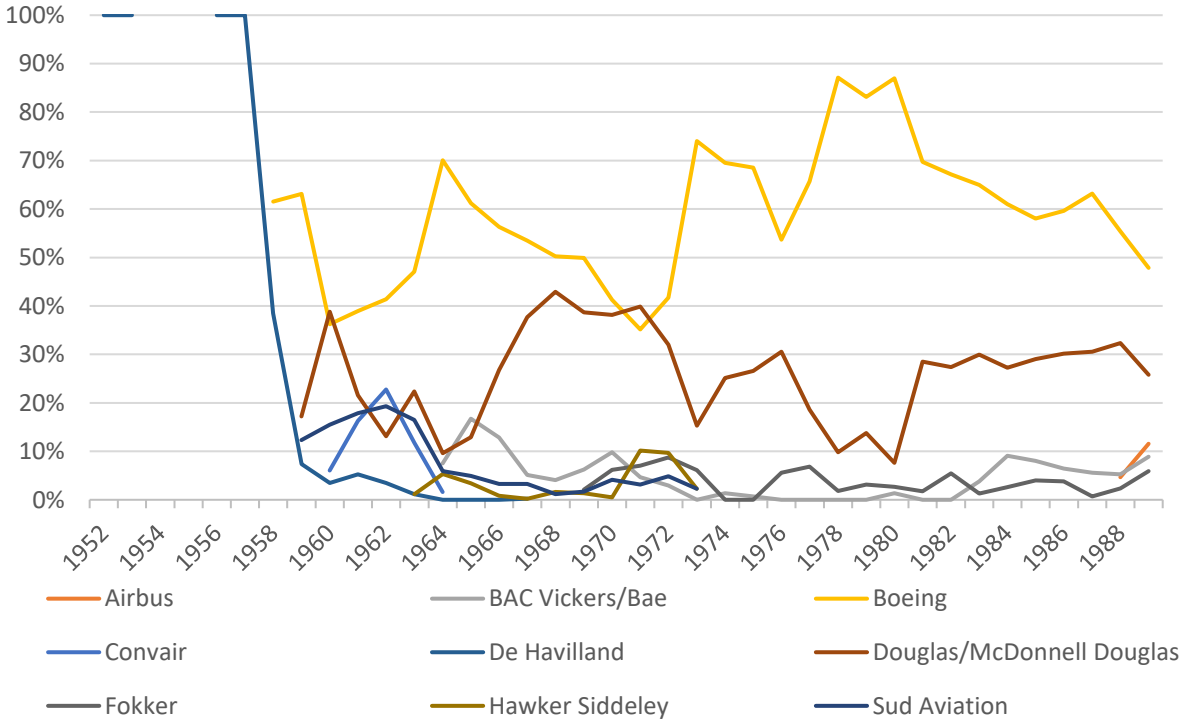
Figure 3 details the picture from the perspective of the aircraft producers in that it depicts the effective market shares by segment and country group. In the early 1960s, the typical jet used by an airline of the Global South (if it had jets at all) was the comparably small and cheap twin-engined Caravelle. But since the mid-1960s, Boeing aircraft dominated. While this holds for the Global North as well, Boeing fared disproportionately better in the South when compared to its most important rival, Douglas (see Panels 3a and 3b). Boeing's short- and medium-range

Figure 3: Manufacturers' annual effective market shares in the Global South and the Global North, 1952-1989

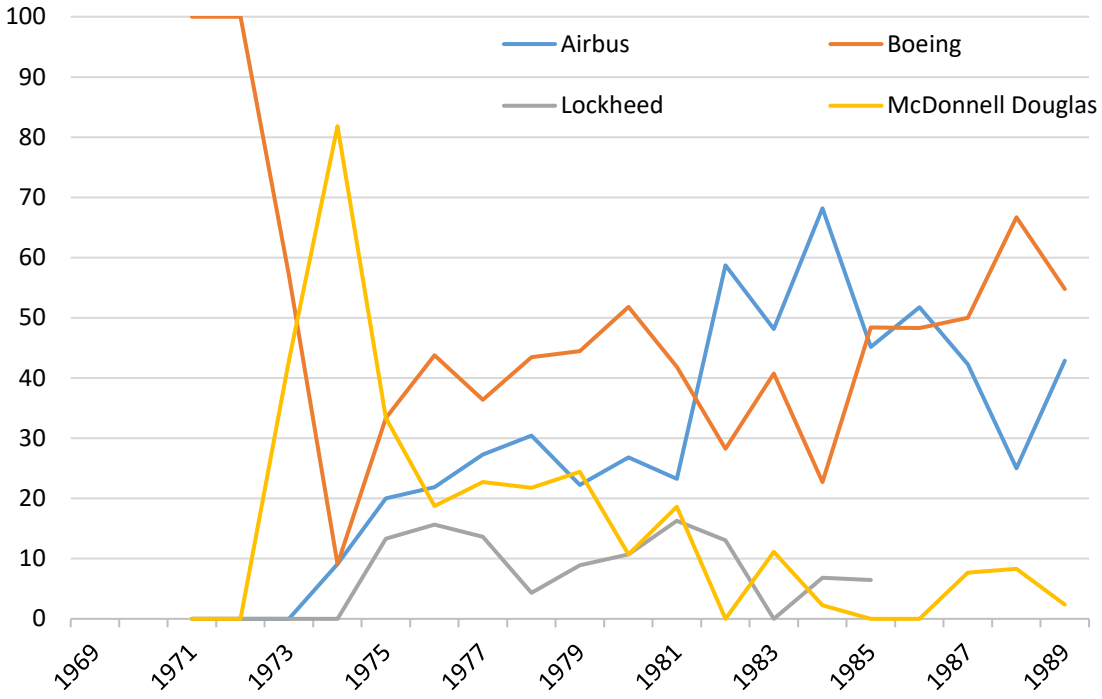
(a) Global South – narrow-bodies



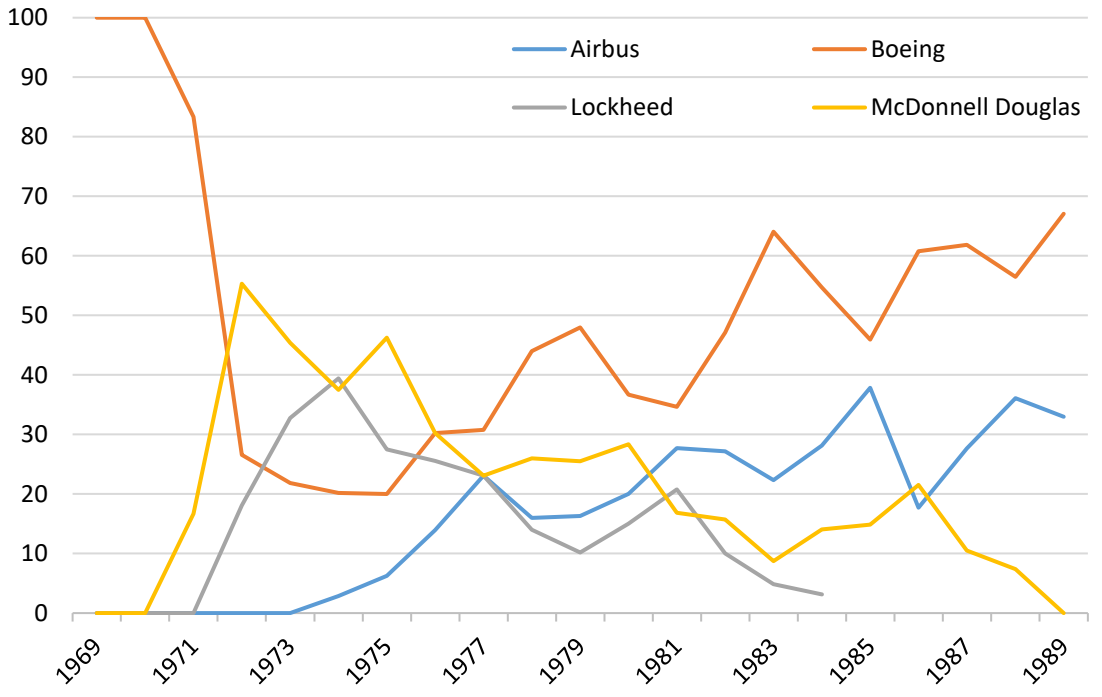
(b) Global North – narrow-bodies



(c) Global South – wide-bodies



(d) Global North – wide-bodies



Notes: Aérospatiale, Dassault, and VFW omitted due to the negligible number of deliveries.

Sources: Authors' dataset; see Section 2.

.

Table 2: Top 20 first-hand customers of Western-type jetliners from the Global South, 1952-1989

Operator (sorted by total aircraft procured)	Home country	Region	Founded[a]	Number of brand-new aircraft procured[b c]		
				Narrow-bodies	Wide-bodies	*Total*
Garuda Indonesia	Indonesia	Southeastern Asia	1949	86	21	*107 (5.8%)*
Civil Aviation Administration of China (CAAC)	China	Eastern Asia	1952	74	17	*91 (4.9%)*
Saudia	Saudi-Arabia	Near-/Middle East	1946	32	49	*81 (4.4%)*
Singapore Airlines (SIA)	Singapore	Southeastern Asia	1971[d]	14	65	*79 (4.3%)*
Viação Aérea Rio Grandense (VARIG)	Brazil	Central-/South America	1927	40	27	*67 (3.6%)*
South African Airways (SAA)	South Africa	Africa	1934	39	22	*61 (3.3%)*
Indian Airlines	India	Southern Asia	1953	49	10	*59 (3.2%)*
Korean Air Lines (KAL)	South Korea	Eastern Asia	1962	12	38	*50 (2.7%)*
Aerolíneas Argentinas	Argentina	Central-/South America	1949	39	7	*46 (2.5%)*
Mexicana de Aviación	Mexico	Central-/South America	1921	41	5	*46 (2.5%)*
Aeronaves de México/Aeroméxico	Mexico	Central-/South America	1934	41	4	*45 2.4(%)*
Thai Airways	Thailand	Southeastern Asia	1960	8	35	*43 (2.3%)*
Misr Airlines/United Arab Airlines/Egyptair	Egypt	Africa	1932	27	15	*42 (2.3%)*
JAT Yugoslav Airlines	Yugoslavia	Southeastern Europe	1927	40	2	*42 (2.3%)*
Air India	India	Southern Asia	1932	13	22	*35 (1.9%)*
Air Algérie	Algeria	Africa	1947	33	2	*35 (1.9%)*
Kuwait Airways	Kuwait	Near-/Middle East	1954	14	18	*32 (1.7%)*
Viação Aérea São Paulo (VASP)	Brazil	Central-/South America	1933	29	3	*32 (1.7%)*
Iran Air	Iran	Near-/Middle East	1946	16	15	*31 (1.7%)*
Pakistan International Airlines (PIA)	Pakistan	Southern Asia	1946	21	10	*31 (1.7%)*

Notes: [a] If not otherwise indicated, the founding date – not to be confused with the date when an airline's operation actually started – is taken from https://www.planespotters.net (accessed: 18 April 2023) [b] Percentage share in all deliveries to the Global South (*N*=1,854) in parentheses; share rounded to one decimal place. [c] Taking Soviet aircraft into account, slightly changes the picture: TAROM would enter with 43 jets (17 of Soviet and 26 of Western origin), as well as would Cubana with 31 procured Soviet jets; and CAAC (+17) and United Arab Airlines/Egyptair (+8) would climb in the ranking. [d] Origins date back to 1946; given is the year when Malaysia-Singapore Airlines (MSA) was split into Malaysian Airline System and Singapore Airlines (https://de.wikipedia.org/wiki/Singapore_Airlines; accessed 18 April 2023).
Sources: Authors' dataset.

jets, the B727 introduced in 1963 and the somewhat smaller B737 (1967) sold much better in the Global South than the DC-9 (1965). Boeing's dominance of the commercial aircraft market held well through to the early 1980s, when the Airbus 300/310 began to gain significant shares in the market for wide-bodies below the capacity of the B747, which was too large for many airlines, especially in the Global South. Only the B767 introduced in 1981 competed successfully with the Airbus A300/310 family

Referring to our mentioning of Singapore Airlines and others a few lines back, it might be interesting to see which operators from the Global South did buy Western-type jets and to which number. To this end, Table 2 ranks the top 20 first-hand customers from the Global South by the number of jets delivered to them over the whole period of investigation.[37] These airlines account for 1,055 of 1,854 jets delivered to 169 operators from the Global South in total, equalling a share of 57 per cent. Garuda Indonesia, the leading airline in terms of procured brand-new jets, ranks 26th when looking at the full ranking including operators from the Global North. As an appetizer for the subsequent analysis, it is noteworthy that more than half of the jets procured by Garuda, namely 56 according to our counting, are Dutch-manufactured Fokker F28.

5. Colonies and aircraft procurement

We now take a more detailed perspective and focus on aircraft sales of producers located in the former colonial master countries. Therefore, we divide the buyer countries in the (former or quasi) colonies as defined above (see Section 3 and the Appendix) – British former and quasi colonies in the Global South and Global North, French colonies, Dutch colonies, former and US quasi-colonies, and the remaining countries of the Global South – and look for whether we find evidence that both characteristics – the origin and destination of brand-new jets – are stochastically dependent. Statistically speaking, that would be our alternative hypothesis (H1). If, historically, political and especially colonial ties do not play a role in how jets distribute over destination countries, both characteristics can be considered stochastically independent (H0). To determine whether we can reject H0 in favour of H1, we use contingency tables, a convenient descriptive statistical tool to assess stochastic independence.

[37] Note that when adding up aircraft per airline (here as well as for the purposes of Figure 1), we decided not to distinguish between narrow-bodies and wide-bodies, meaning that we weighted jets equally. If one counted wide-bodies twice, assuming the average wide-body may well represent twice the passenger load of the average narrow-body, the ranking would look somewhat different with SIA and Saudia being on top.

Tables 3 to 5 provide such contingency tables for both market segments in the periods 1952-1969 and 1969/70-1989. The distinction into these two periods is informed by the fact that wide-bodies appeared on the scene in 1969; we chose to distinguish these sub-periods for a start to make the narrow-body-segment directly comparable. Because we know for each manufacturer *i* (rows in Tables 3 to 5) and for each country group *j* (columns in Tables 3 to 5) the number of delivered jets, we can calculate the *expected* distribution in the cells in between.[38] The expected sales s_{ij}^{exp} in Panel A are compared to the actual historical sales s_{ij}^{his} in Panel B; and $s_{ij}^{his}/s_{ij}^{exp} = cb_{ij}$ is the relation of historical to expected sales (Panel C). Technically, it holds that if cb_{ij} is different from zero, then the manufacturer *i* has sold disproportionally in country group *j*, which implies both characteristics are stochastically dependent. For the sake of the argument, we label a sufficiently large positive deviation from expectations for the relevant *manufacturer country-country group of destination-combination* a "positive colonial bias" and vice versa.[39]

Thus, the value for cb_{11} in the first cell of Panel C for the period 1952-1969 (see Table 3) indicates that Boeing's actual sales to former UK colonies in the Global South were 30.9 per cent higher than one could have expected a priori. This, however, is not a positive *colonial bias* because Boeing's home country, the United States, is obviously not considered in our framework to be the relevant colonial master; the figure does certainly have information content in that it can tell from where (former) UK colonies procured jets in case we should find that it were not producers from Britain in the first place. Of actual interest in this country group are, of course, the sales of British manufacturers to (former) UK colonies. Whether cb_{21}=27.0 for BAC should already be interpreted as a colonial bias is discussable; we tend to take modest deviations from zero in either direction to still be compatible with the idea of stochastic independence (that is, we like to interpret the figures more conservatively to not fall for overinterpretation). But the values for De Havilland and particularly Hawker Siddeley are higher than +100 per cent, that is, the number of actual sales is more than twice the number of expected sales. If, for the sake of convenience, we take ">100 per cent" as a benchmark, we find that colonial ties certainly did matter in the case of British aircraft before 1970. This holds all the

[38] The value in the first cell is calculated as follows: 201/498*106/498*498 = 201*106/498 = 42.8.

[39] We computed several measures of and, respectively, performed several tests for stochastic dependence (Pearson's corrected contingency coefficient, Cramer's V, Chi-square test, G-Test); all of them suggest that, formally, the results for the narrow-body segment in both periods are jointly stochastically dependent. So, both characteristics do play a role in explaining the distribution of aircraft sales.

Table 3: Contingency tables for the narrow-body-segment – expected versus actual deliveries, 1952-1969

Manufacturer	All deliveries	Former UK colonies & quasi-colonies in the Global South	Former UK colonies in the Global North	Former French colonies	Former US colonies & quasi-colonies	Former Dutch colonies	Remaining Global South	**Row Total**
A) Expected sales								
Boeing	1,826	42.8	79.9	13.7	46.0	2.0	16.5	**201**
Brit. Aircraft Corp.	220	7.9	14.7	2.5	8.5	0.4	3.0	**37**
Convair	101	2.1	4.0	0.7	2.3	0.1	0.8	**10**
De Havilland	110	7.2	13.5	2.3	7.8	0.3	2.8	**34**
Douglas	1,058	30.2	56.5	9.7	32.5	1.4	11.7	**142**
Fokker	11	0.0	0.0	0.0	0.0	0.0	0.0	**0**
Hawker Siddeley	54	2.6	4.8	0.8	2.7	0.1	1.0	**12**
Sud Aviation	258	13.2	24.7	4.2	14.2	0.6	5.1	**62**
UK combined	*384*	17.7	33.0	5.7	19.0	0.8	6.8	***83***
US combined	*2,985*	75.1	140.3	24.1	80.8	3.5	29.1	***353***
Column total	**3,638**	**106**	**199**	**33**	**114**	**5**	**41**	**498**
B) Actual sales								
Boeing	1,826	56	84	5	40	0	16	**201**
Brit. Aircraft Corp.	220	10	7	0	14	0	6	**37**
Convair	101	0	1	0	6	3	0	**10**
De Havilland	110	16	3	4	10	0	1	**34**
Douglas	1,058	0	104	3	26	2	7	**142**
Fokker	11	0	0	0	0	0	0	**0**
Hawker Siddeley	54	12	0	0	0	0	0	**12**
Sud Aviation	258	12	0	21	18	0	11	**62**
UK combined	*384*	*38*	*10*	*4*	*24*	*0*	*7*	***83***
US combined	*2,985*	*56*	*188*	*9*	*72*	*5*	*23*	***353***
Column total	**3,638**	**106**	**199**	**33**	**114**	**5**	**41**	**498**
C) Deviation in %								
Boeing	1,826	+30.9	+4.6	–62.5	–13.1	n/a	–3.3	
Brit. Aircraft Corp	220	+27.0	–52.7	n/a	+65.3	n/a	+97.0	
Convair	101	–100.0	–75.0	n/a	+162.1	+2,888.0	n/a	
De Havilland	110	+121.1	–77.9	+77.5	+28.5	–100.0	–64.3	
Douglas	1,058	n/a	+83.0	–68.1	–20.0	+40.0	–40.1	
Fokker	11	n/a	n/a	n/a	n/a	n/a	n/a	
Hawker Siddeley	54	+369.8	n/a	n/a	n/a	n/a	n/a	
Sud Aviation	258	–9.1	n/a	+411.1	+26.8	n/a	+115.5	
UK combined	*384*	*+115.1*	*–69.8*	*–27.3*	*+26.3*	n/a	*+2.4*	
US combined	*2,985*	*–25.5*	*+34.0*	*–65.8*	*–10.9*	*+41.1*	*–20.9*	
Column total	**3,638**							

Notes: Expected sales rounded to one decimal place.

Sources: Authors' computations.

Table 4: Contingency tables for the narrow-body-segment – expected versus actual deliveries, 1970-1989

Manufacturer	All deliveries	Former UK colonies & quasi-colonies in the Global South	Former UK colonies in the Global North	Former French colonies	Former US colonies & quasi-colonies	Former Dutch colonies	Remaining Global South	**Row Total**
A) Expected sales								
Airbus	74	6.0	6.9	1.9	5.4	2.1	6.7	**29**
Boeing	3,038	176.8	205.0	57.7	159.5	62.1	199.9	**861**
Brit. Aircraft Corp.	216	17.5	20.2	5.7	15.7	6.1	19.7	**85**
Dassault	11	0.0	0.0	0.0	0.0	0.0	0.0	**0**
Fokker/VFW	276	30.4	35.2	9.9	27.4	10.7	34.4	**148**
Hawker Siddeley	63	7.4	8.6	2.4	6.7	2.6	8.4	**36**
McDon. Douglas	1,152	37.8	43.8	12.3	34.1	13.3	42.7	**184**
Sud /Aérospatiale	35	0.2	0.2	0.1	0.2	0.1	0.2	**1**
UK combined	279	24.8	28.8	8.1	22.4	8.7	28.1	**121**
US combined	4,190	214.6	248.8	70.0	193.6	75.4	242.6	***1,045***
Column total	**4,865**	**276**	**320**	**90**	**249**	**97**	**312**	**1,344**
B) Actual sales								
Airbus	74	15	14	0	0	0	0	**29**
Boeing	3,038	204	229	73	164	6	185	**861**
Brit. Aircraft Corp.	216	10	25	1	17	1	31	**85**
Dassault	11	0	0	0	0	0	0	**0**
Fokker/VFW	276	25	21	14	18	62	8	**148**
Hawker Siddeley	63	1	0	0	0	0	35	**36**
McDon. Douglas	1,152	21	31	1	50	28	53	**184**
Sud /Aérospatiale	35	0	0	1	0	0	0	**1**
UK combined	279	*11*	*25*	*1*	*17*	*1*	*66*	**121**
US combined	4,190	*225*	*260*	*74*	*214*	*34*	*238*	***1,045***
Column total	**4,865**	**276**	**320**	**90**	**249**	**97**	**312**	**1,344**
C) Deviation in %								
Airbus	74	+151.9	+102.8	n/a	n/a	n/a	n/a	
Boeing	3,038	+15.4	+11.7	+26.6	+2.8	–90.3	–7.4	
Brit. Aircraft Corp.	216	–42.7	+23-5	–82.4	+8.0	–83.7	+57.1	
Dassault	11	n/a	n/a	n/a	n/a	n/a	n/a	
Fokker/VFW	276	–17.7	–40.4	+41.3	–34.4	+480.4	–76.7	
Hawker Siddeley	63	–86.5	n/a	n/a	n/a	n/a	+318.8	
McDon. Douglas	1,152	–44.4	–29.2	–91.9	+46.7	+110.8	+24.1	
Sud /Aérospatiale	35	n/a	n/a	+1,393.3	n/a	n/a	n/a	
UK combined	279	*–55.7*	*–13.2*	*–86.6*	*–24.2*	*–88.5*	*+135.0*	
US combined	4,190	*+4.8*	*+4.5*	*+5.7*	*+10.5*	*–54.9*	*–1.9*	
Column total	**4,865**							

Notes: Expected sales rounded to one decimal place.

Sources: Authors' computations.

Table 5: Contingency tables for the wide-body-segment – expected versus actual deliveries, 1969-1989

Manufacturer	All deliv-eries	Former UK colonies & quasi-colo-nies in the Global South	Former UK colonies in the Global North	Former French colonies	Former US colonies & quasi-col-onies	Remain-ing Global South	**Row Total**
A) Expected sales[b]							
Airbus	484	69.1[a]	54.2[a]	5.9	21.1	59.7	**201**
Boeing	1,038	120.5	94.4	10.2	36.8	104.1	**366**
Lockheed	249	18.8	14.7	1.6	5.7	16.2	**57**
McDonnell Douglas	446	27.6	21.7	2.3	8.4	23.9	**84**
US combined	*1,733*	*166.9*	*130.8*	*14.1*	*50,9*	*144.3*	***507***
Column total	**2,217**	**236**	**185**	**20**	**72**	**204**	**717**
B) Actual sales							
Airbus	484	87[a]	17[a]	6	15	85	**201**
Boeing	1,038	106	133	10	33	84	**366**
Lockheed	249	22	18	1	6	16	**57**
McDonnell Douglas	446	21	17	3	24	19	**84**
US combined	*1,733*	*149*	*135*	*14*	*57*	*119*	***507***
Column total	**2,217**	**236**	**185**	**20**	**72**	**204**	**717**
C) Deviation in %							
Airbus	484	+25.9[a]	–68.6	+2.4	–28.9	+42.3	
Boeing	1,038	–12.0	+40.8	–2.0	–10.2	–19.3	
Lockheed	249	+17.3	+22.4	–37.1	n/a	–1.3	
McDonnell Douglas	446	–24.0	–21.6	+28.0	+184.5	–20.5	
US combined	*1,733*	*–10.7*	*+28.4*	*–1.0*	*+12.0*	*–17.5*	
Column total	**2,217**						

Notes: [a] Only deliveries since 1979, when Britain joined the Airbus consortium again, considered. [b] Expected sales rounded to one decimal place.

Sources: Authors' computations.

more for the French Caravelle (+468 per cent). The only other values higher than 100 per cent are cb_{34}=162.1 and cb_{35}=2,888.0 for the Convair Coronado of which only nine aircraft were sold to the Global South. But actual sales of six rather than two aircraft to former and quasi colonies, as predicted, is not too spectacular and might be an outlier. Taken together, we do find a positive British and French colonial bias for narrow-body sales in that first period, but not for US sales to former and quasi colonies.

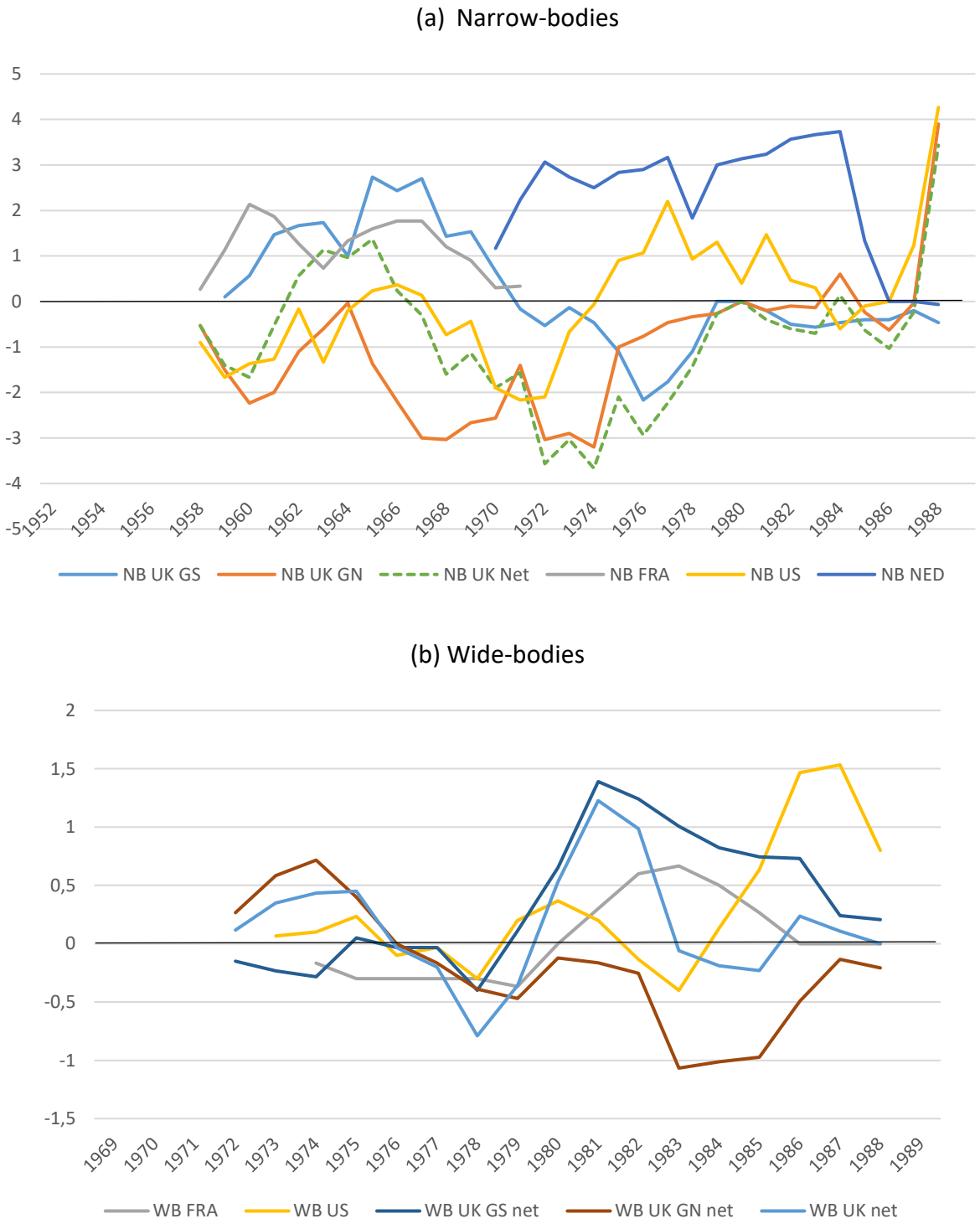
The picture changes if we look for sales of narrow-body jets in the wide-body era starting in 1969 (see Table 4). Although the market continued to grow (albeit somewhat slower than before), British aircraft manufacturers sold less aircraft in the period 1970-89 than before. The positive colonial bias for one-hundred per cent British-manufactured jets vanishes

completely. In contrast, both the one-hundred per cent French Caravelle and the Dutch Fokker 28 profited from a pronounced positive colonial bias of 1,393.3 and 480.4 per cent, respectively. As KLM nearly exclusively relied on Douglas jets at the time and provided Garuda (Indonesia) with technical assistance, Douglas also has a high cb value close to 100 per cent. As with the first period, we do not find evidence for a positive US quasi colonial bias. A special case in that period in both segments is Airbus because it involved, among others, France and, since 1979, Britain as owner countries. Since Airbus initially sold no A320 jets to airlines from former French colonies, there clearly cannot be a related positive colonial bias. However, there clearly is a positive bias regarding both former UK colonies from the Global North (Ansett Australia) and South (Indian Airlines). A part of this bias should certainly be attributed to Britain; we will come back to the how in a few lines.

Switching to the wide-body segment (see Table 5) leads to results which are very similar to those of Jopp and Spoerer (2021, 2023). Only for (McDonnell) Douglas do we find a cb value larger than 100, tellingly linked with the US's former colonies and quasi-colonies. But Boeing and Lockheed were less successful in Latin America, so that the combined value for the US manufacturers is low. The results for Airbus are also low and, thus, within the limits of what might still be in line with stochastic independence, so that we can confirm our earlier results that there was no positive colonial bias concerning the procurement of wide-body aircraft at play.

Finally, we seek to depict the colonial bias per producer country year-by-year to be able to locate when precisely the tide for especially UK manufacturers turned. Figure 4 illustrates in two Panels the development of the colonial bias in our period under investigation in the form of annual time series. For the purpose of constructing the time series, we computed contingency tables for each year and segment (Tables not displayed), which, technically, look exactly like Tables 3 to 5. The only difference is that we express the bias as the absolute number of jets sold beyond or short of expectations and not in a percentage deviation. The straight lines show the colonial bias for Britain, France, the Netherlands (not in Panel B), and the US. For Britain, we also computed a net effect over the Global South (GS) and the Global North (GN). A difficulty for the computation of the bias arises from the fact that Airbus was owned partly by France (37.9 per cent) and since 1979 also by Britain (20.0 per cent; the remainder falling on Germany, 37.9, and Spain, 4.2 per cent. We therefore attributed only 37.9 per cent

Figure 4: The development of the colonial bias over time



Notes: Depicted is a three-year centred moving average of the annual estimates. The bias is reported in terms of jets sold beyond expectations (positive bias) or, respectively, short of expectations (negative bias).

Sources: Authors' own computations.

of Airbus's colonial bias vis-à-vis former French colonies to France; and we did accordingly for Britain regarding Airbus's bias regarding former UK colonies. We also consider that Rolls-Royce was the sole provider of the engines for the US-manufactured Lockheed Tristar; therefore, we attributed a flat 50 per cent of Lockheed's bias towards former UK colonies to Britain; the percentage seems defendable because the engines certainly are an important construction piece.[40]

The British (former) colonies are an interesting case: For the (former) British colonies that fall under the Global North category, there is a pronounced negative deviation, especially in the decade around 1970. In contrast, we do find a positive colonial bias in those (former) British colonies who belonged to the Global South in the 1960s. We find the same result for the French Caravelle. Both biases peter out shortly after the first oil price crisis of 1973-75. In contrast, the Dutch regional jet Fokker 28 sold disproportionally well in former Dutch colonies – Indonesia in the first place – all over its lifetime of production. For the US manufacturers, the picture is mixed. Relative sales to the Global South were low in the 1960s but increased during and after the first oil price crisis, when the British and French models had left the market.

The picture in the wide-body segment looks different. Here we find the aforementioned Tristar-effect in the first half of the 1980s. While the graph for the (former) French colonies hovers quite stably around the zero-line – no colonial bias for the Airbus models in either direction – the one for the US manufacturers goes up in the second half of the 1980s, when the Boeing 767 fared quite well in Latin America.

5. Conclusion

Our main results are that we do find a positive colonial bias for British narrow-body jets until ca. 1973 and for the Lockheed Tristar (which was exclusively equipped with British Rolls-Royce engines) from 1981-1985. For both the French Caravelle and the Dutch Fokker 28 we also find a clear positive colonial bias over the models' entire production cycle. Concerning wide-body jets (introduced in 1969) the colonial effects are, apart from the result for the Tristar, no longer apparent. Jets of the A300/310 family were not sold disproportionately to former French and British (after 1979, when British Aerospace joined the Airbus consortium) colonies, and American jets, both narrow- and wide-bodies, were not particularly popular with Latin American

[40] On Rolls-Royce and Lockheed, see Smith (2007) and Sakade (2015).

airlines except for the last years of our observation period. Our interpretation of these findings is that colonial ties to former colonial masters from Europe especially mattered until the early/mid 1970s when, triggered by the two oil price crises, economic motives became more important than colonial ties in informing procurement decisions.

Table 6: Political sales summary

Manufacturer	Exact manufacturing period[a]	Market segment[b]	Percentage share of deliveries to (former) colonies in the Global South (Global North) exceeding expectations…[c]	
			…in all deliveries to airlines from a manufacturer's home country's (former) colonies	…in total deliveries
Airbus	1974-1989	WB	18.5 %	3.5 %
	1988-1989	NB	84.0 % (21.4 %)	17.0 % (4.0 %)
Boeing	1958-1989	NB	2.1 %	0.1 %
British Aircraft Corporation	1964-1989	NB	21.0 %	1.0 %
Convair	1960-1965	NB	61.7 %	3.6 %
De Havilland	1952-1967	NB	55.0 %	8.0 %
Douglas/McDonnell Douglas	1959-1989	NB	20.1 %	3.6 %
		WB	65.0 %	3.5 %
Fokker	1969-1989	NB	82.7 %	18.8 %
Hawker Siddeley	1963-1978	NB	72.0 %	8.0 %
Lockheed	1972-1985	WB	7.5 %	0.1 %
Sud Aviation	1959-1973	NB	80.5 %	4.7 %

Notes: [a] Taken from Table 1. [b] "NB" is "narrow-body", "WB" is "wide-body". [c] Includes quasi-colonies.

Sources: Authors' computations.

By a simple rearrangement of our quantitative findings, we can put forward an additional notion and link up with first efforts to determine the percentage of "political sales" in the commercial aircraft industry in its formative period (see Section 2). For each manufacturer, Table 6 reports the percentage share of deliveries to (former) colonies and quasi-colonies that exceed expectations according to our framework (see Section 4). Take the example of Airbus: The percentages in column four say that said deliveries amounted to 18.5 (wide-body segment) and, respectively, 84.0 (narrow-body segment) per cent of the deliveries to airlines from (former) colonies of the manufacturer's home country. Only for Airbus do we find deliveries

to airlines from (former) colonies in the Global North exceeding expectations, too; it goes without saying that in Airbus's case deliveries to (former) French colonies and, since 1979, to (former) British colonies are considered (like only Dutch colonies are considered in Fokker's case, and so on). Overall, the percentages given in column four span a pretty large range – from a mere 2.1 per cent linked with Boeing to percentages of 80 per cent and more regarding Sud Aviation, Fokker, and Airbus.

As for the percentage of political sales, column five on the far right is instructive. Given is the percentage of said deliveries in the manufacturer's total deliveries per segment. So, for example, the 18.5 per cent of unexpected wide-body deliveries by Airbus to airlines from French and (since 1979) British colonies in the Global South equal 3.5 per cent of all wide-body deliveries made since the introduction of the A300. We suggest this percentage to be a lower bound estimate of the historical percentage of deliveries up to 1989 that are highly suspicious of having the nature of a political sale; "lower bound estimate" because, so far, we only have looked at such political sales potentially arising from colonial ties.

Our findings bear several implications regarding the broader literature on colonial legacy and the special literature on the development of the commercial aircraft industry: First, our empirical evidence supports the idea that former colonial ties shape the political and economic relationships between the former colonial master and its colonies beyond formal independence of the latter; in other words, colonial heritage creates path dependence that is reaching well into the post-colonial period and is not easily broken. Second, we show this for the example of the transport sector in the context of which two events of truly world-wide impact – the two oil price crises – seem to have contributed to breaking the path. Third, that said, Airbus's narrow-body sales in 1988 and 1989 seem to establish an exception; more research is needed here to trace the colonial bias beyond 1989. Fourth, more research is needed on the actual economic implications of the percentages given in column five of Table 6 on the manufacturers' fate, too; how would, for example, Fokker have fared had it faced prospects of almost a fifth less deliveries? Finally, fifth, there seems to be the need for extending the grand narratives of the commercial aviation industry for the role of colonial ties and political sales in the narrower sense of the word.

References

Adiputri, Ratih D. (2014): The Dutch legacy in the Indonesian Parliament. In: *Political Sciences and Public Affairs* 2(2), pp. 1-8.

Ahrens, Ralf (2020): The Importance of Being European: Airbus and West German Industrial Policy from the 1960s to the 1980s. In: *Journal of Modern European History* 18(1), pp. 63-78.

Alemazung, Joy A. (2010): Post-Colonial Colonialism: An Analysis of International Factors and Actors Marring African Socio-Economic and Political Development. In: *The Journal of Pan African Studies* 3(10), pp. 62-84.

Alesina, Alberto; Dollar, David (2000): Who Gives Foreign Aid to Whom and Why? In: *Journal of Economic Growth* 5(1), pp. 33-63.

Amankwah-Amoah, Joseph; Debrah, Yaw A. (2014): Air Afrique: The Demise of a Continental Icon. In: *Business History* 56(4), pp. 517-546.

Argiropoulos, Kathleen O. (1982): The Airline Fuel Crisis in the 1970s. In: George W. James (ed.), *Airline Economics*, Lexington: Lexington Books, pp. 99-112.

Austin, Gareth (2010): African Economic Development and Colonial Legacies. In: *International Development Policy* 1(1), pp. 11-32.

Berthélemy, Jean-Claude (2006): Bilateral Donors' Interest vs. Recipients' Development Motives in Aid Allocation: Do all Donors Behave the Same? In: *Review of Development Economics* 10(2), pp. 179-194.

Bourmaud, Daniel (1995): France in Africa: African Politics and French Foreign Policy. In: *Issue: A Journal of Opinion* 23(2), pp. 58-62.

Button, Kenneth; Martini, Gianmaria; Scotti, Davide (2015): African Decolonization and Air Transportation. In: *Journal of Transport Economics and Policy* 49(4), pp. 626-639.

Carrick, Roger (2013): Witness to History: Some Aspects of the United Kingdom's Relations with former Colonies: the Australia Case. In: *Britain and the World* 6(1), pp. 119-124.

Chafer, Tony (1992): French African Policy: Towards Change. In: *African Affairs* 91(362), pp. 37-51.

Connell-Smith, Gordon (1976): Latin America in the Foreign Relations of the United States. In: *Journal of Latin American Studies* 8(1), pp. 137-150.

DeSantis, J. Angelo (2013): Engines Turn or Passengers Swim: A Case Study of How ETOPS Improved Safety and Economics in Aviation. In: *Journal of Air Law and Commerce* 77, pp. 3-68.

Devereux, David R. (1995): State versus Private Ownership: The Conservative Governments and British Civil Aviation 1951-1962. In: *Albion: A Quarterly Journal Concerned with British Studies* 27(1), pp. 65-85.

Devereux, David R. (2021): Jets across the Atlantic?: Britain and its Civil Aviation Industry, 1945-1963. In: *Journal of Transatlantic Studies* 19, pp. 99-113.

Dierikx, Marc L. J. (1991): Struggle for Prominence: Clashing Dutch and British Interests on the Colonial Air Routes, 1918-1942. In: *Journal of Contemporary History* 26(2), pp. 333-351.

Dobson, Alan P. (2017): *A History of International Civil Aviation. From its Origins Through Transformative Evolution*. Abingdon/New York: Routledge.

Edgerton, D. E.H. (1984): Technical Innovation, Industrial Capacity and Efficiency: Public Ownership and the British Military Aircraft Industry, 1935-48. In: *Business History* 26(3), pp. 247-279.

Fauri, Francesca (2021): The Italian State's Active Support for the Aeronautical Industry: the Case of the Caproni Group, 1910-1951. In: *Business History Review* 95, pp. 219-247.

Francis, John G.; Pevzner, Alex F. (2006): Airbus and Boeing: Strengths and limitations of strong states. In: *Political Science Quarterly* 121(4), pp. 629-651.

Grier, Robin M. (1999): Colonial Legacies and Economic Growth. In: *Public Choice* 98, pp. 317-335.
Hayward, Keith (1989): *The British Aircraft Industry*. Manchester/New York: Manchester University Press.
Hayward, Keith (1994): *The World Aerospace Industry: Collaboration and Competition*. London: Duckworth & RUSI.
Hayward, Keith (2005): Trade Disputes in the Commercial Aircraft Industry: A Background Note. In: *The Aeronautical Journal* 109(1094), pp. 157-166.
Hayward, Keith (2018): Government and British Civil Aerospace 1945-64. In: *Journal of Aeronautical History* No. 2018(4), pp. 100-136.
Higham, Robin (1965): Government, Companies, and National Defense: British Aeronautical Experience 1918-1945 as the Basis for a Broad Hypothesis. In: *Business History Review* 39(3), pp. 323-347.
Higham, Robin (1968): Quantity vs. Quality: The Impact of Changing Demand on the British Aircraft Industry, 1900-1960. In: *Business History Review* 42(4), pp. 443-466.
Hopkins, A. G. (2008): Rethinking Decolonization. In: *Past & Present* No. 200, pp. 211-247.
Huber, Marie (2022): State-owned Success in the Air: Ethiopian Airlines and the multinational Air Afrique in the 1960s and 1970s. In: *Zeitschrift für Unternehmensgeschichte/Journal of Business History* 67(2), pp. 271-292.
Imbeau, Louis M. (1989): *Donor Aid – the Determinants of Development Allocations to Third World Countries: A Comparative Analysis*. New York: Peter Lang.
Jaworski, Taylor; Smyth, Andrew (2016): Shakeout in the Early Commercial Airframe Industry. In: *The Economic History Review* 71(2), pp. 617-638.
Jönsson, Christer (1981): Sphere of Flying: The Politics of International Aviation. In: *International Organization* 35(2), pp. 273-302.
Jopp, Tobias A.; Spoerer, Mark (2021): How Much Does Airbus's Rise over 1974–89 Owe to "Political Sales"? A Pledge for a Statistical Approach. In: *Nacelles. Passé et présent de l'aéronautique et du spatial/Past and Present of Aeronautics & Space* 11(2), n.p.
Jopp, Tobias A.; Spoerer, Mark (2023): On the Political Determinants of Wide-body Aircraft Sales, 1974–89. In: *Applied Economics Letters* 30(4), pp. 531-535.
Kunkel, Sönke (2012): Zwischen Globalisierung, internationalen Organisationen und „global governance". In: *Vierteljahrshefte für Zeitgeschichte* 4/2012, pp. 555-577.
Lange, Matthew K. (2004): British Colonial Legacies and Political Development. In: *World Development* 32(6), pp. 905-922.
Lee, Alexander; Schultz, Kenneth A. (2012): Comparing British and French Colonial Legacies: A Discontinuity Analysis of Cameroon. In: *Quarterly Journal of Political Science* 7(4), pp. 1-46.
Lumsdaine, David H. (1993): *Moral Vision in International Politics: the Foreign Aid Regime, 1949-1989*. Princeton: Princeton University Press.
Lundan, Sarianna M.; Jones, Geoffrey (2001): The 'Commonwealth effect' and the process of internationalization. In: *The World Economy* 24(1), pp. 99-118.
Lynn, Stephen R. (1976): *Douglas production list DC8-DC9-DC10*. Hounslow: Airline Publications and Sales Ltd.
Martin, Guy (1985): The Historical, Economic, and Political Bases of France's African Policy. In: *The Journal of Modern African Studies* 23(2), pp. 189-208.
Martin, Guy (1995): Continuity and Change in Franco-African Relations. In: *The Journal of Modern African Studies* 33(1), pp. 1-20.

Maseland, Robert (2018): Is Colonialism History? The Declining Impact of Colonial Legacies on African Institutional and Economic Development. In: *Journal of Institutional Economics* 14(2), pp. 259-287.

McCormack, Robert L. (1989): Imperialism, Air Transport and Colonial Development: Kenya, 1920–46. In: *Journal of Imperial and Commonwealth History* 17(3), pp. 374-395.

McGuire, Steven (1997): *Airbus Industrie: Conflict and Cooperation in US-EC Trade Relations*. London/New York: Macmillan Press Ltd./St. Martin's Press, Inc.

McKesson, John A. (1990): France and Africa: Today and Tomorrow. In: *French Politics and Society* 8(1), pp. 34-47.

Mitchener, Kris; Weidenmier, Marc D. (2005): Empire, Public Goods, and the Roosevelt Corollary. In: *The Journal of Economic History* 65(3), pp. 658-692.

Mlambo, A. S. (1992): Civil Aviation in Colonial Zimbabwe, 1912-1980. In: *Zambezia* 19(2), pp. 99-116.

Mowery, David C.; Rosenberg, Nathan (1982): The Commercial Aircraft Industry. In Richard R. Nelson (ed.), *Government and Technological Progress. A Cross-Industry Analysis*, New York et al.: Pergamon Press, pp. 101-161.

Newhouse, John (1983): *The Sporty Game*. New York: Alfred A. Knopf.

Nthenya, Nahashon Nzioka; Donzé, Pierre-Yves (2022): Indigenization and the Long-Term Formation of Human Capital in Africa: The Airline Industry in East Africa Since 1946. In: *Enterprise & Society* (ahead-of-print), pp. 1-27.

Pavcnik, Nina (2002): Trade Disputes in the Commercial Aircraft Industry. In: *The World Economy* 25(5), pp. 733-751.

Pearson, Jessica Lynne (2017): Defending Empire at the United Nations: The Politics of International Colonial Oversight in the Era of Decolonisation. In: *Journal of Imperial and Commonwealth History* 45(3), pp. 525-549.

Ricard, Serge (2006): The Roosevelt Corollary. In: *Presidential Studies Quarterly* 36(1), pp. 17-26.

Roach, John R.; Eastwood, Anthony B. (1997): *Jet Airliner Production List: Volume I – Boeing*. West Drayton: The Aviation Hobby Shop.

Robertson, Paul L.; Singleton, John (2001): The Commonwealth as an economic network. In: *Australian Economic History Review* 41(3), pp. 241-266.

Sakade, Takeshi (2015): "Riding Two Horses": The British Aviation Industry's Position vis-à-vis Boeing and Airbus Industrie. In: *The Kyoto Economic Review* 84(1-2), pp. 29-45.

Sakade, Takeshi (2022): *The British Aircraft Industry and American-led Globalisation*. Abingdon/New York: Routledge.

Schraeder, Peter J.; Hook, Steven W.; Taylor, Bruce (1998): Clarifying the Foreign Aid Puzzle: A Comparison of American, Japanese, French, and Swedish Aid Flows. In: *World Politics* 50(2), pp. 294-323.

Simonson, G. R. (1960): The demand for Aircraft and the Aircraft Industry, 1907-1958. In: *The Journal of Economic History* 20(3), pp. 361-382.

Smith, David (2007): Defence Contractors and Diversification into the Civil Sector: Rolls-Royce, 1945-2005. In: *Business History* 69(5), pp. 637-662.

Smith, Tony (1978): A Comparative Study of French and British Decolonization. In: *Comparative Studies in Society and History* 20(1), pp. 70-102.

Soland, Peter (2019): The Miracle (and Mirage) of Mexican Flight: Aviation Development in Mexico, during and after the Second World War. In: *The Journal of Transport History* 40(1), pp. 25-43.

Staniland, Martin (1987): Francophone Africa: The Enduring French Connection. In: *The Annals of the American Academy of Political and Social Science* 489, pp. 51-62.

Strang, David (1990): From Dependency to Sovereignty: An Event History Analysis of Decolonization 1870-1987. In: *American Sociological Review* 55(6), pp. 846-860.

Strang, David (1991): Global Patterns of Decolonization, 1500-1987. In: *International Studies Quarterly* 35(4), pp. 429-454.

Taylor, Ian (2019): France à Fric: the CFA Zone in Africa and Neocolonialism. In: *Third World Quarterly* 40(6), pp. 1064-1088.

Toye, John (2014): Assessing the G77: 50 years after UNCTAD and 40 years after the NIEO. In: *Third World Quarterly* 35(10), pp. 1759-1774.

Van de Walle, Nicolas (1991): The Decline of the Franc Zone: Monetary Politics in Francophone Africa. In: *African Affairs* 90, pp. 383-405.

White, Nicholas J. (2000): The Business and the Politics of Decolonization: The British Experience in the Twentieth Century. In: *The Economic History Review* 53(3), pp. 544-564.

Wittig, Stephan (2021): Transatlantic Trade Dispute: Solution for Airbus-Boeing Under Biden? In: *Intereconomics* 56(1), pp. 23-31.

Zevin, Robert (1972): An Interpretation of American Imperialism. In: *The Journal of Economic History* 32(1), pp. 316-360.

Appendix

Table A.1: Classification of first-hand customers' home countries by colonial ties (sorted by year of initial delivery)

Country	Country group	Most recent (quasi) colonial ties to …	Independent since	First jet to a first-hand customer
Canada	Global North	United Kingdom	1931	1953
Algeria	Global South	France	1962	1959
Argentina	Global South	United States	1816	1959
Australia	Global North	United Kingdom	1942	1959
Brazil	Global South	United States	1825	1959
Egypt	Global South	United Kingdom	1922	1960
India	Global South	United Kingdom	1947	1960
Ireland	Global North	United Kingdom	1921	1960
Lebanon	Global South	France	1943	1960
Mexico	Global South	United States	1921	1960
Morocco	Global South	France	1956	1960
South Africa	Global South	United Kingdom	1931	1960
Colombia	Global South	United States	1819	1961
Israel	Global North	United Kingdom	1948	1961
Pakistan	Global South	United Kingdom	1947	1961
Tunisia	Global South	France	1956	1961
Venezuela	Global South	United States	1821	1961
Hong Kong	Global North	United Kingdom	–	1962
Sudan	Global South	United Kingdom	1956	1962
Indonesia	Global South	Netherlands	1949	1963
Ivory Coast	Global South	France	1960	1963
Kuwait	Global South	United Kingdom	1961	1963
Chile	Global South	United States	1818	1964
Trinidad and Tobago	Global South	United Kingdom	1962	1964
Ghana	Global South	United Kingdom	1957	1965
Iraq	Global South	United Kingdom	1932	1965
Jordan	Global South	United Kingdom	1946	1965
New Zealand	Global North	United Kingdom	1947	1965
Philippines	Global South	United States	1946	1965
Syria	Global South	France	1946	1965
El Salvador	Global South	United States	1838	1966
Kenya	Global South	United Kingdom	1963	1966
Costa Rica	Global South	United States	1821	1967
Nicaragua	Global South	United States	1838	1967
Puerto Rico	Global North	United States	–	1967
Afghanistan	Global South	United Kingdom	1919	1968
Bahamas	Global South	United Kingdom	1973	1968
Peru	Global South	United States	1821	1968
Singapore	Global South	United Kingdom	1963	1968
United Arab Emirates	Global South	United Kingdom	1971	1968
Cyprus	Global South	United Kingdom	1960	1969
Dominican Republic	Global South	United States	1865	1969
Madagascar	Global South	France	1960	1969
Sri Lanka	Global South	United Kingdom	1948	1969
Uruguay	Global South	United States	1828	1969
Nigeria	Global South	United Kingdom	1960	1970
Bolivia	Global South	United States	1825	1970
Guatemala	Global South	United States	1821	1971
Cameroon	Global South	France	1960	1972

Table A.1 continued

Country	Country group	Most recent (quasi) colonial ties to …	Independent since	First jet to a first-hand customer
Malawi	Global South	United Kingdom	1964	1972
Malaysia	Global South	United Kingdom	1957	1972
Nauru	Global South	United Kingdom	1968	1972
Nepal	Global South	United Kingdom	1768	1972
Fiji	Global South	United Kingdom	1970	1973
Gabon	Global South	France	1960	1974
Honduras	Global South	United States	1821	1974
Jamaica	Global South	United Kingdom	1962	1974
Brunei	Global South	United Kingdom	1984	1975
Netherlands Antilles	Global North	Netherlands	–	1975
Togo	Global South	France	1960	1975
Bahrain	Global South	United Kingdom	1971	1976
Senegal	Global South	France	1960	1976
Yemen	Global South	United Kingdom	1967	1976
Zambia	Global South	United Kingdom	1964	1976
Myanmar	Global South	United Kingdom	1948	1977
Qatar	Global South	United Kingdom	1971	1977
Liberia	Global South	United States	1847	1978
Niger	Global South	France	1960	1978
Swaziland	Global South	United Kingdom	1968	1978
Tanzania	Global South	United Kingdom	1961	1978
Ecuador	Global South	United States	1822	1980
Bangladesh	Global South	United Kingdom	1971	1981
Guinea	Global South	France	1958	1981
Samoa[c]	Global South	United Kingdom	1962	1981
Benin	Global South	France	1960	1982
Burkina Faso	Global South	France	1960	1983
Mali	Global South	France	1960	1983
Malta	Global South	United Kingdom	1964	1983
Zimbabwe	Global South	United Kingdom	1980	1986
Mauritius	Global South	United Kingdom	1968	1988
Botswana	Global South	United Kingdom	1966	1989
Cayman Islands	Global North	United Kingdom	–	1989
New Caledonia	Global North	France	–	1989
Papua-New Guinea	Global South	United Kingdom	1975	1989
Seychelles	Global South	United Kingdom	1976	1989
Somalia	Global South	United Kingdom	1960	1989

Sources: Authors' own classification.

RESH Discussion Paper Series

No. 1 / 2020 *Mark Spoerer*

Did Firms Profit from Concentration Camp Labour? A Critical Assessment of the Literature

No. 2 / 2020 *Tobias A. Jopp*

A Happiness Economics-Based Human Development Index for Germany (1920-1960)

No. 3 / 2020 *Tobias A. Jopp/Mark Spoerer*

Teaching Historical Statistics: Source-Critical Mediation of Aims and Methods of Statistical Approaches in Historiography

No. 4 / 2020 *Mark Spoerer*

The Short Third Reich: On Continuities in Socio-Economic Structures between the Weimar Republic, the Third Reich and the Federal Republic

No. 5 / 2020 *Tobias A. Jopp/Mark Spoerer*

How Political Were Airbus and Boeing Sales in the 1970s and 1980s?

No. 6 / 2020 *Jonas Scherner/Mark Spoerer*

Infant Company Protection in the German Semi-Synthetic Fibre Industry: Market Power, Technology, the Nazi Government and the Post-1945 World Market

No. 7 / 2020 *Michael Buchner/Tobias A. Jopp/Mark Spoerer/Lino Wehrheim*

On the Business Cycle of Counting – or How to Quantify Quantification. An Empirical Analysis of the Application of Quantitative Methods in German Historiography

No. 8 / 2022 *Lino Wehrheim/Bernhard Liebl/Manuel Burghardt*

Extracting Textual Data from Historical Newspaper Scans and its Challenges for "Guerilla-Projects"

No. 9 / 2023 *Angela Huang/Mark Spoerer*

Expectation Formation in Pre-modern Times

No. 10 / 2023 *Tobias A. Jopp/Mark Spoerer*

Civil Aircraft Procurement and Colonial Ties: Evidence on the market for jetliners, 1952-1989

DOI 10.5283/epub.54273 RESH Papers – ISSN 2701-2050