Business Concentration around the World: 1900–2020[*]

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Abstract

We collect long-run data on the firm size distribution in ten market-based economies in Asia, Europe, North America, and Oceania, where we can obtain comprehensive coverage of the population of companies. Around the world, we observe prevalent increases in the concentration of sales and net income over the past century, in the aggregate and at the industry level. Meanwhile, employment concentration has been stable over the long run in most cases. The evidence shows that rising dominance of large firms is a pervasive phenomenon, not limited to the recent decades or the United States, and they often achieve a greater scale with relatively few workers.

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I Introduction

The extent to which production can be accomplished through organizations and planning is one of the longest running themes in the history of economics. In the two and a half centuries following Smith (1776)'s articulation of the invisible hand, mapping out the scope of the visible hand has been an inevitable inquiry (Marx, 1867; Marshall, 1890; Berle and Means, 1932; Hayek, 1945; Galbraith, 1967; Arrow, 1974; Chandler, 1977; Lucas, 1978). As Coase (1937) described, in every society, we find "islands of conscious power in this ocean of unconscious co-operation like lumps of butter coagulating in a pail of buttermilk."

In this paper, we document that, among a variety of "free-market" economies with available data, production has become increasingly concentrated in the largest firms over the past century. The rising concentration is especially strong in terms of sales and net income: for example, in many countries, the largest 1% firms by sales (net income) now account for 70% to 80% of economy-wide sales (net income), up from 40% to 50% in the early 20th century. We also observe long-run increases of sales concentration at the industry level wherever we can find available data. Meanwhile, employment concentration has been relatively stable in most cases: for example, in many places where we can find data, the largest 1% firms by employees account for roughly 50% of employment throughout the 20th century.

We search market-based advanced economies for long-run data on the firm size distribution. We look for comprehensive coverage of the business population from official statistics (e.g., tax statistics or census) like the data we compile for the U.S. in Kwon, Ma, and Zimmermann (2024), especially given that public companies are few and heavily selected in many countries so stock market data have serious limitations. We estimate the share of top companies from tabulations of firms by size bins (unless the underlying sources directly report the share of the largest firms).[1] We use the generalized Pareto interpolation (Blanchet, Fournier, and Piketty, 2022), which fits a Pareto coefficient to each size bin and interpolates these Pareto coefficients. In Kwon, Ma, and Zimmermann (2024), we checked that the top shares estimates are over 0.99 correlated if we instead fit and interpolate lognormal distributions, or directly add up the top bins to a given number of businesses.

For firm size distribution by sales and net income (along with equity capital in a few cases), we uncover data for several sets of countries. First, for Germany, we are able to find aggregate tabulations by size of sales covering all types of companies since the 1920s, published by the German statistical office. The information comes from the sales tax and value added tax. These German tabulations are also available

[1] For instance, if the tabulations are by size of sales (net income), then we estimate the share of the largest firms by sales (net income) in overall sales (net income). For countries that have tabulations by net income, we need to restrict to firms with positive income.

at the broad industry group level (e.g., manufacturing, services, retail/wholesal trade) and more detailed industry level. Similarly, for Austria, we are able to find aggregate tabulations by sales for all types of companies, published by the Austrian statistical office starting in 1954. In addition, for France, we are able to find aggregate tabulations by sales published by the French statistical office between 1949 and 1998 (the tabulations include finance before 1998 but not afterwards, and so far we have not been able to construct consistent extensions after that). The data cover all industrial and commercial firms, and exclude self-employed professionals and agriculture firms.

Second, for Denmark and Switzerland, we are able to find aggregate tabulations of corporations by size of equity capital from the early 1900s to the 1980s, which come from corporate register data. Then starting in the late 20th century, both countries publish tabulations by size of sales covering all types of companies (not just corporations), which come from the business registry and value added tax returns.

Third, for the U.K., between 1958 and 1992, we are able to find tabulations of manufacturing firms by size of net output (akin to value added) from the Census of Production, and Prais (1976) provides additional estimates of the share of the 100 largest manufacturing enterprises by net output for selected years since 1909. Then starting in 1985, we can find tabulations of the number of businesses by turnover (sales) size published by the U.K. statistical office.

Fourth, for Australia, we can find aggregate tabulations of corporations by size of taxable income since 1940 from Taxation Statistics. For Canada, we can find aggregate tabulations of corporations by size of current year taxable profit between 1944 and 1964 from Taxation Statistics, and by size of taxable income (current year profit minus prior year loss) from Corporation Taxation Statistics between 1969 and 1987. For Singapore, we can find tabulations of corporations by size of assessed income since 1972, from the Yearbook of Statistics before 2004 and the Inland Revenue Authority of Singapore (IRAS) afterwards.

Finally, for South Korea, thanks to data collected and shared by Choi et al. (2024), we observe the share of the largest 100 and 500 manufacturers by sales in total manufacturing gross output from the early 1970s to the early 2010s.

We start with the top 1% shares. The benchmark for evaluating the disparity of business size is the top % share in a number of models (Aghion et al., 2023; Hsieh and Rossi-Hansberg, 2023). Moreover, the top % share is portable across different countries that differ a lot in size. In Germany, Austria, and France, we observe that top shares by sales have increased persistently over the 20th century. The share of the large 1% companies by sales was around 0.4 in the 1920s, around 0.6 by the 1970s, and around 0.7 by the 2010s. In Denmark and Switzerland, we observe a general increase in the top 1% share by capital among corporations from around 0.4 in the early 1900s to around 0.6 by the 1980s, with a continued increase in the top 1% share by sales among all types of companies since the 1980s and 1990s. In the U.K., we are only

able to find consistent long-run data for manufacturing, and we observe that the top 1% net output share increased from around 0.6 in the late 1950s to around 0.7 in the 1980s, and the top 1% sales share increased from around 0.65 in the mid 1980s to around 0.7 by the early 2010s. This pattern is consistent with our findings in the U.S., where rising concentration in manufacturing was also stronger before the 1980s. For Australia and Canada, the top 1% net income share among corporations started from around 0.4 in the 1940s, increased to around 0.6 around the 1980s, and Australian data show continued increase to around 0.8 by 2000 (after which the Australian top shares have been relatively flat and Canadian data currently end in 1987). For Singapore, the data start later in the early 1970s, and the top shares show upward trends too.

We then present the top N shares, which face several practical challenges. First, picking the right N across these different settings is challenging and somewhat arbitrary. For illustration, we use top 500 as the primary example (except when the top bin is not granular enough). Second, the top N share is trickier in settings where we only have size tabulations for corporations (Australia, Canada, Singapore, as well as Denmark and Switzerland by size of equity capital). Specifically, in the U.S. data (Kwon, Ma, and Zimmermann, 2024), we observe that the top N share among all businesses, the top $x\%$ share among all businesses, and the top $x\%$ share among corporations have similar behavior, but the top N share among corporations can behave differently in settings that experience changes in the prevalence of corporations. The reason is that when corporations become more common, for example, the total size of corporations expands. As the result, the top N share among corporations can change artificially due to the expanded denominator (whereas the top $x\%$ share among corporations is not sensitive to the issue because the numerator adapts too). To minimize the impact of the changing prevalence of corporations versus noncorporations, we estimate the size of all businesses for the denominator (using proxies of the corporate share), and we have to assume that the largest firms are all corporations (which may underestimate the top shares).

We observe long-run increases in the top 500 shares by sales in Germany, Austria, and France, though the level is less comparable across countries. We also observe long-run increases in the top 500 shares by equity capital in Denmark and Switzerland, and then continuing increases in the top shares by sales in these countries in recent decades. For the U.K., the top 100 net output share in manufacturing increased until around the 1980s, and the long-run increase is even stronger if we extend the series to 1909 using estimates by Prais (1976). In Australia and Canada, the top 500 shares show similar long-run trends to those of the top percent shares. In Singapore, the top 500 shares also increased. In Korea, the top 100 (500) share in manufacturing rose from around 20% (30%) to 45% (55%) from the early 1970s to the early 2010s.

For sales concentration in detailed industries, in Germany we are able to find CR10 for two-digit manufacturing industries since 1954 and for four-digit manufacturing industries since 1968 from various government reports. In Australia we are able to find CR20 for two-digit manufacturing industries from

1968 to 2000, from various manufacturing census reports. In both countries, the two-digit manufacturing industries became less granular in the 1990s due to the adoption of new industry classifications. In both cases, we observe long-run increases in these CRx ratios.

For employment concentration, we obtain tabulations of firm size by employment in the aggregate and at the industry level covering manufacturing and retail/wholesale trade when sectoral breakdown is possible (other industries such are services are not consistently defined over time in these industry-level datasets). In Germany, we use census data for 1925 to 1987, and the German company register for 2003 to 2022. In Switzerland, we use census data for 1925 to 2008, and the Swiss company register for 2011 to 2022. The datasets for these two countries both cover a very long period of time and provide industry-level information. For France, tabulations for 1966 to 1998 are available in publications by the French statistical office, based on firm tax returns (1973 and 1975) and the French company register (1966 and 1981 to 1998). We also obtain tabulations of firm size by employment in U.K. manufacturing from 1958 onwards from the same sources as the above, and in Australian manufacturing from 1968 to 2005 from various publications by the Australian Bureau of Statistics. Finally, for Korea, we observe the share of the largest 100 and 500 manufacturers by employment in total manufacturing employment from the early 1970s to the early 2010s thanks to data shared by Choi et al. (2024). Finally, we supplement with employment size distribution in the U.S. since 1958 from Census Enterprise Statistics publications, which have consistent coverage for manufacturing and trade, and standard employment size distributions from Census Business Dynamic Statistics starting in 1978.

In the aggregate and in manufacturing, we observe that employment concentration has been relatively stable, measured using either top 1% shares or top 500 shares. In some cases, employment concentration appears to have declined since the 1980s, such as France, U.K. manufacturing, and Australian manufacturing. The exception is retail/wholesale trade, where employment concentration has increased over the long run in countries with available data.

Why does sales concentration increase substantially while employment concentration remains stable? One possibility is large firms expand their scale using capital (physical or intangible) rather than labor. Declining capital price over time (correspondingly rising capital productivity) can stimulate more automation, especially among large firms as they are more inclined to pay the automation cost (Hubmer and Restrepo, 2024). It can also reallocate towards capital intensive firms (Desazars, 2025). Another possibility is sales are increasingly reallocated to high markup firms (Autor et al., 2020). In Autor et al. (2020), large high markup firms have high overall productivity (and therefore high labor productivity), so reallocation towards them should raise employment concentration as well (even though the increase would be less than that in sales concentration). Other mechanisms, including changes in barriers to entry or trade costs

(Melitz, 2003; Covarrubias, Gutiérrez, and Philippon, 2020; Hopenhayn, Neira, and Singhania, 2022), also predict increases in both sales and employment concentration. Finally, since we observe stable ratios of sales (gross output) to GDP (value added), it seems unlikely that the results are driven by outsourcing the production of intermediate goods, since outsourcing should raise gross output to value added.[2]

A natural question is how to think about country-level firm size distribution in our data in the era of globalization. First, Melitz (2003) provides a classic framework for understanding the firm size distribution in an economy in the presence of international trade. Melitz (2003) suggests that trade could increase the size disparity of firms relative to autarky, as large and productive firms engage in exporting. In the data, we observe strong rising concentration before the age of globalization, and this phenomenon is not specific to a particular trade regime. Second, some might be interested in the global firm size distribution. This endeavor is challenging as we cannot easily aggregate across countries given their different size metrics and reporting conventions. In addition, some of the largest companies globally are influenced by political forces (e.g., Sinopec and Saudi Aramco are among the top ten companies by revenue globally). Firms in each country share more similar economic environments and are more easily comparable.

A growing body of research has been interested in the concentration of control through common ownership, given the rise of large asset managers (e.g., Vanguard, BlackRock) that own a significant fraction of shares across multiple companies (see Schmalz (2018) and Backus, Conlon, and Sinkinson (2019) for reviews of the common ownership literature). Such common ownership driven by large asset managers is unlikely to affect most of our sample period (before index funds became prominent) and sample firms (the vast majority are not publicly listed).[3]

Literature review Our paper provides new facts about the long-run evolution of economic activities. Changes in production concentration have drawn much attention in recent research. Several influential papers highlight rising industry concentration in the U.S. since the 1980s (Autor et al., 2020; Covarrubias, Gutiérrez, and Philippon, 2020). Recent work using European data has focused on the post-2000 period (Bighelli et al., 2023; Bajgar et al., 2023; Gutierrez and Philippon, 2023; KalemlÌ-Özcan et al., 2024). Early studies provide some snapshots of production concentration in certain years for the initial decades of the 20th century (Means et al., 1939; Blair, Houghton, and Rose, 1946; Adelman, 1951; Kaplan, 1954; Collins and Preston, 1961; Federal Trade Commission, 1969; Prais, 1976; Khemani, 1980), but systematic long-run

[2] If firms outsource employment internationally, value added of domestic production should decrease relative to sales. If firms outsource to others domestically, total value added stays the same and total sales should increase as there are more sales from the intermediate steps.

[3] Some countries have holding companies or business groups that control multiple operating companies. Although it is difficult to verify the exact reporting details, the treatment in our data should be consistent over time since total sales relative to GDP are stable. If individual operating companies report separately rather than combined as a fully consolidated entity, then it would likely increase total sales to GDP (since intercompany sales are not netted out) and decrease top shares.

evidence has been lacking in most countries.

The main precedent (to our knowledge) of comprehensive long-run data on the firm size distribution is our previous work (Kwon, Ma, and Zimmermann, 2024), which covers the U.S. from 1918 to 2018. A natural question is whether the long-run increase in production concentration is unique to the U.S. This question also relates to the growing body of studies that investigate the mechanisms behind rising concentration, including technology, globalization, regulation, and demographics (Sutton, 1991, 2001; Brynjolfsson et al., 2008; Bessen, 2020; Ganapati, 2021; Hopenhayn, Neira, and Singhania, 2022; Aghion et al., 2023; Hsieh and Rossi-Hansberg, 2023; Akcigit and Ates, 2023; Lashkari, Bauer, and Boussard, 2024; Choi et al., 2024; Crouzet et al., 2024; Kroen et al., 2024; Peters and Walsh, 2024). Is the increasing prominence of large firms due to the policies or demographics of the U.S. or broad-based economic forces? The pervasive long-run trends we document suggest that broad-based economic forces are important to consider. Meanwhile, each country and time period can be influenced by additional factors, and our findings about the general trends complement studies that analyze specific settings.

Our focus in this paper is the firm size distribution in the economy. The firm size distribution has several implications. First, as large firms become more important in economic activities, they play a greater role in shaping aggregate outcomes: shocks and frictions that affect them have stronger macroeconomic effects (Gabaix, 2011; Crouzet and Mehrotra, 2020). Second, their increasing economic influence also makes the governance of these large enterprises more consequential (Berle and Means, 1932). Meanwhile, our focus is not competition or market power.[4] It is well recognized that concentration is not a barometer for market power (Demsetz, 1973; Syverson, 2019). We document that the organization of production has changed substantially around the developed world over the long run, but we do not take a stance on whether the increasing dominance of large firms is good or bad. Interestingly, across the countries and time periods in our sample, rising concentration of production activities is not necessarily accompanied by rising inequality among households (Atkinson and Piketty, 2007), which suggests that their determinants can be different.

The rest of the paper is organized as follows. Section II describes the data sources. Section III presents the main facts. Section IV concludes.

[4] In addition, although economy-wide production concentration has been increasing, concentration in the market for a particular product or location may behave differently (Rossi-Hansberg, Sarte, and Trachter, 2021; Hsieh and Rossi-Hansberg, 2023; Benkard, Yurukoglu, and Zhang, 2023; Hoberg and Phillips, 2023), for example if firms expand into more markets. It may also respond more to regulations at the product market level (Affeldt et al., 2021).

II Data

II.A Sources and Coverage

Our large-scale data collection starts with major countries that approximate free-market economies. We search through official sources to look for systematic tabulations of firm size distributions. We have been able to obtain high quality data for the list of countries summarized in Table 1. The column "Size Bin Type" shows the size measure available in the tabulations. The column "Company Type" shows the types of companies covered, which would be either all types of companies (including corporations and noncorporations) or corporations. The column "Year" shows the time span. The frequency is mostly annual, except for occasional gaps (especially in early years). The column "Source" gives a brief summary of the source. We provide detailed information about the sources and variable definitions in Appendix IA2.[5]

II.A.1 Size by Sales, Net Income, and Equity Capital

We start with size bins by financial variables, mainly sales and net income (supplemented by equity capital in a few cases), which we use in Section III.A. Here we organize the countries into five groups broadly based on the similarity of data sources, size measures, or time span: 1) Germany, Austria, and France, 2) Denmark and Switzerland, 3) United Kingdom, 4) Australia, Canada, and Singapore, and 5) South Korea. We proceed in the same order in the following paragraphs.

Germany The German data offer size bins by sales for all types of companies, published by the German statistical office for a long period of time from the 1920s to the 2010s (see Table IA6 for detailed descriptions of the sources). We obtain physical copies of the publications before 1935 through the German National Library (Statistisches Reichsamt, 1928, 1931, 1932, 1938), and PDFs through the statistical library of the Statistisches Bundesamt afterwards (Statistisches Bundesamt, 1955-1961, 1962-1976, 1978-2011, 2012-2022*a*); we then transcribe the data. The information in the size tabulations comes from the sales tax and value added tax, which all firms have to pay if their sales exceed a pre-specified threshold. The

[5]We estimate top shares for each country, which measure the firm size distribution in each economy. In recent decades, globalization leads to more interactions across countries. The firm size distribution in each country is a meaningful statistic even in a world with global trade, and Melitz (2003) provides a classic framework for understanding what it captures in the presence of trade. Melitz (2003) points out that, relative to autarky, trade could make the firm size distribution in a country more skewed (e.g., firms with high productivity engage in trade while those with low productivity shrink). Some might also be interested in the global firm size distribution, but data from different countries are not easily comparable, and some of the largest firms globally are influenced by political forces (e.g., Sinopec, Saudi Aramco are among the largest 5 firms by revenue globally). For most of our sample period, firms in each country face more similar economic environments. A large part of our sample also covers the period before globalization, so the evidence sheds light on how the firm size distribution has evolved through different international trade regimes.

Table 1 – Data Coverage

Country	Size Bin Type	Company Type	Year	Source
Australia	By net income By employment	Corporations All (manufacturing)	1940–2020 1968–2005	See Table IA1
Austria	By sales	All	1954–2020	See Table IA2
Canada	By net income	Corporations	1944–1987	See Table IA3
Denmark	By capital By sales	Corporations All	1902–1983 1970–2020	See Table IA4
France	By sales By employment	All (industrial & commercial) All	1949–1998 1966–1998	See Table IA5
Germany	By sales By employment	All All	1924–2019 1925–2022	See Table IA6
Korea	By sales By employment	Corporations (manufacturing) Corporations (manufacturing)	1970–2011 1970–2011	Choi et al. (2024)
Singapore	By net income	Corporations	1972–2022	See Table IA7
Switzerland	By capital By sales By employment	Corporations All All	1901–1987 1965–2021 1929–2022	See Table IA8
U.K.	By net output By sales By employment	All (manufacturing) All (manufacturing) All (manufacturing)	1909–1992 1985–2022 1958–2022	See Table IA9

Notes: This table summarizes the coverage of firm size distribution data for each country.

threshold is 8,000 Deutsche Marks in 1958, 20,000 Deutsche Marks by 1980, and 17,500 Euros by 2003 (see Appendix IA2.6 for more details).[6] The tabulations sort firms based on total sales (including both taxable and tax-exempt sales) in Germany. Exports are included, but sales outside of Germany (foreign sales) are not included in the statistics.[7]

Before 1945, the tax statistics cover firms from the entire "German Reich." After 1945, the statistics cover West Germany. West Berlin is included from 1957 onward, the Saarland from 1960 onward, and East Germany from 1992 onward. Since the economy of East Germany was less than 10% that of West

[6]The tabulations in some years before 1958 have a minimum threshold while others do not. For the years where there is no minimum threshold, we impose one ourselves to maximize consistency over time. For the years between 1955 and 1958, we set this threshold to 8,000 Deutsche Mark to be consistent with later years. For 1950, we set the threshold to 6,000 Deutsche Mark (since 8,000 is not a size bin threshold in that year). For the years until 1935 that use a different currency, we set this threshold to 5,000 Reichsmark.

[7]"Exports" include goods and services supplied to customers outside the EU, as well as intra-community supplies (innergemeinschaftliche Ausfuhr), referring to VAT-free transfers between EU countries for VAT-registered buyers. "Foreign sales" (sometimes also called foreign-foreign sales "Ausland-Ausland" Umsätze) are sales by taxable persons that take place exclusively abroad. The sales are therefore outside of the territorial scope of the domestic value added tax. Value added tax systems are broadly harmonized in the European Union with core principles set by Council Directives (see https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:02006L0112-20190116#tocId8).

Germany around the time of the reunification (Maddison, 2006), this change does not have a material impact on total sales or top shares. Figure IA16 shows that total sales in our data relative to GDP do not have any time trend, which indicates that the coverage of the tax statistics over time is stable (except the coverage is lower for the first two years of the data in 1924 and 1925).

Austria The Austrian data also offer size bins by sales for all types of companies, published by the Austrian statistical office starting in 1954 (see Table IA2 for detailed descriptions of the sources). We obtain physical copies from the German National Library before 2012 (Österreichischen Statistischen Zentralamt, 1958; Österreichisches Statistisches Zentralamt, 1960-1980; Österreichischen Statistischen Zentralamt, 1977-1999; Statistik Österreich, 2000; Statistik Austria, 2001-2014), and PDFs from the website of Statistik Austria after 2012 (Statistik Austria, 2015-2023*a*); we then transcribe the data. The information in the size tabulations similarly comes from the sales tax and the value added tax, which all firms have to pay if their sales exceed a pre-specified threshold. It is roughly 1,500 Schillings in 1954, 40,000 Schillings in 1973, 30,000 Euros in 2018, and 35,000 Euros in 2020 (see Appendix IA2.2 for more details). The tabulations sort firms based on total sales (including both taxable and tax-exempt sales) in Austria. This includes exports, but excludes foreign sales. Figure IA11 shows that total sales in our data relative to GDP do not have any time trend, which indicates that the coverage of the tax statistics over time is stable.

France For France, the primary data sources are "Annuaire statistique de la France" published by the French statistical office (Insee) (Ministère des Finances et des Affaires Économiques, 1954-2000) and "Statistiques & Études Financières" published by the Ministry of Economy and Finance (Ministère de l'Economie et des Finances, 1954-1984). These two sources allow us to obtain tabulations of companies by the size of sales (chiffre d'affaires) from 1952 onwards. Currently we stop in 1998 because size tabulations up to this point include finance, but size tabulations after 1998 exclude finance. We are able to add data for 1949 and 1950 from Bulletin "Mensuel de Statistique" published by the French statistical office (Ministère des Finances et des Affaires Économiques, 1953) We obtain physical copies of "Statistiques & Études Financières" from the University of Chicago Library. We download PDFs of "Annuaire statistique de la France" and "Bulletin Mensuel de Statistique" from Gallica, which is the digital library of the French national library (Bibliothèque nationale de France). We then transcribe the data.

The information comes from the sales tax and the value added tax. The data cover all industrial and commercial firms (Bénéfices Industriels et Commerciaux). The data exclude BNC (Bénéfices Non Commerciaux) firms (e.g., self-employeed professionals like doctors and lawyers) and agriculture firms.[8]

[8]The size tabulations always cover large firms that belong to Bénéfices Réels Normal (BRN) tax regime, and cover smaller firms that belong to Régime Social des Indépendants (RSI) tax regime in some years. They do not cover Forfait (FORF) firms, which are small in number and in volume. For consistency, in years when RSI firms are not included in the size tabulations, we assign all of them to the size bin that corresponds to their average size. We also assign all of FORF firms to the size bin

Sales are measured by chiffre d'affaires, defined as the total revenue generated by a company in French territories, including exports.

Denmark We use two types of tabulations for Denmark (see Table IA4 for detailed descriptions of the sources). First, between 1902 and 1983, Statistics Denmark published tabulations of corporations by size of equity capital based on corporate register data.[9] The tabulations are regularly published in the Statistisk Årbog and in accompanying publications (with additional information) by Statistics Denmark. We obtain PDFs of these publications through Statistics Denmark (Danmarks Statistik, 1903-1975, 1928-1932, 1984-1987) and transcribe the data. In 1977, a minimum capital size requirement of 100,000 Kronors was introduced.

Second, from 1970 to 1999, Statistics Denmark published tabulations by sales that cover all types of companies (not just corporations), based on the business registry and value added tax returns (the value added tax was introduced in Denmark in 1967). These tabulations by sales are discontinued in 2000. We obtain PDFs through Statistics Denmark (Danmarks Statistik, 1973-1981, 1983-2001*b*) and transcribe the data. The tabulations by sales cover all types of businesses with sales above a minimum threshold. The threshold is 5,000 Kronors in 1970 and 20,000 Kronors in 1999. For years 2000 to 2020, we obtain customized tabulations by sales directly from the General Enterprise Statistics group at Statistics Denmark. These tabulations are restricted to active businesses, with the definition of active businesses (industry specific sales cutoffs) changing over time (Danmarks Statistik, 2020). The Danish tabulations by sales capture total domestic sales and exports, but exclude other foreign activities of Danish companies (Danmarks Statistik, 2001*a*). Figure IA13 shows that total sales in our data relative to GDP do not have any time trend.

Switzerland We also use two types of tabulations for Switzerland (see Table IA8 for detailed descriptions of the sources). First, between 1901 and 1987, the Swiss Statistical Office published tabulations of corporations by size of equity capital, based on analyses of joint-stock companies recorded in the Business and Enterprise Register.[10] We obtain PDFs from the Statistical Yearbook and special issues on joint stock corporations published by the Federal Statistical Office (Eidgenössisches Statistisches Amt, 1934, 1922-1986; Bundesamt für Statistik, 1988); we then transcribe the data. In 1937 a minimum capital requirement was introduced for newly formed corporations (corporations with less capital continued to

that corresponds to their average size. This assumption should not affect top share estimates because RSI and FORF firms by definition have low sales, so they matter little for the numerator of top shares.

[9]The Danish tabulations by capital use the value of paid-in capital until 1964, and subscribed capital since 1965. Both concepts are comparable in magnitude.

[10]The Swiss tabulations by capital use the value of issued shares, calculated by multiplying the nominal value of each share at issuance by the total number of shares.

operate, but gradually disappeared in the 1940s, and disappeared entirely by 1952).

Second, since 1995, the Swiss Tax Authority has an annual publication of value added tax statistics. We obtain PDFs from the Swiss Statistical Office (Eidgenössische Steuerverwaltung, 1997-2023) and transcribe the data. These Swiss tabulations by sales use total sales of Swiss firms, including their foreign sales. This is different from the tabulations by sales in Austria, Germany, and Denmark, which do not include foreign sales. In addition, the Swiss Statistical Office published a tabulation of firms by sales size based on the establishment census in 1965. Sales in this year do not include foreign sales however. Figure IA18 shows the coverage of the sales tabulations for Switzerland. The ratio of sales in our data relative to GDP has increased significantly between 1995 and 2020 (from roughly 2.5 to 5.5). This is likely due to the rise of foreign sales, which are present in the data for Switzerland but not much in other by sales tabulations.

U.K. (manufacturing) Our analysis for the U.K. focuses on manufacturing due to data availability. We use two types of tabulations (see Table IA9 for detailed descriptions of the sources). First, between 1958 and 1992, the Census of Production provides tabulations of firm size by net output (value added) for private sector enterprises employing 100 or more persons. It is reasonable to assume that the largest manufacturers in the numerator have more than 100 employees. We also collect information about the total number of enterprises and total net output in manufacturing from separate summary tables. We obtain PDFs from the LSE digital library (Board of Trade, 1960-1973; Department of Industry Business Statistics Office, 1973-1992), and transcribe the data. Prais (1976) provides additional estimates of the share of the 100 largest enterprises in manufacturing by net output for selected years since 1909. The dark blue line with squares in Figure IA20 shows that net output in our data relative to U.K. manufacturing GDP has been stable at one.

Second, starting in 1985, we can find tabulations of the number of businesses by turnover (sales) size from the Size Analyses of United Kingdom Businesses published by the Great Britain Business Statistics Office. We obtain PDFs from inter-library loans and transcribe the data before 1998 (Department of Trade and Industry, Business Statistics Office, 1985-1997), and download data in Excel spreadsheets from the Office for National Statistics afterwards (Office for National Statistics, 1998-2003, 2004-2013, 2015-2022). These data are based on value added tax (VAT) returns submitted to HM Customs and Excise. They cover VAT-registered enterprises, and the registration has a time-varying minimum turnover threshold (enterprises below the VAT registration threshold are excluded before 1992 and are included afterwards if they have chosen to register voluntarily or not to de-register). The data represent total U.K. turnover, "including exempt and zero-rated supplies" (Office for National Statistics, 1998-2003), which suggests that exports are included and foreign sales are excluded. The light blue line with circles in Figure IA20 shows that turnover in our data relative to U.K. manufacturing GDP does not have any time trend.

Australia For Australia, we have data on the population of corporations by size of taxable income since 1940 from Taxation Statistics (see Table IA1 for detailed descriptions of the sources). We obtain PDFs from the National Library of Australia until income year 1993-1994 (Australian Taxation Office, 1944-1961, 1962-1995) and transcribe the data, and download data in Excel spreadsheets from `data.gov.au` afterwards (Australian Taxation Office, 2012-2023*a*). By and large, the data cover all corporations with positive taxable income. Non-resident corporations are also included in the tabulations.

Canada For Canada, we have data on corporations by size of current year taxable profit between 1944 and 1964 from Taxation Statistics, and by size of taxable income (current year profit less prior year loss) between 1969 and 1987 from Corporation Taxation Statistics (see Table IA3 for detailed descriptions of the sources). We obtain physical books from the University of Chicago library (Department of National Revenue, 1944-1964; Statistics Canada, 1969-1987*a*), and transcribe the data. The data cover corporations that file a T2 corporation income tax return. Banks and insurance companies are excluded between 1944 and 1964; correspondingly, we use tabulations for total nonfinancial industries for 1969 to 1987. Before 1964, corporations with gross revenue less than $2,000 are generally excluded from the tabulations; from 1985 to 1987, corporations with assets less than $50,000 and sales less than $10,000 are excluded from the tabulations (see Appendix IA2.3 for more details). Non-resident corporations that carry on businesses in Canada are included.

Singapore For Singapore, we obtain tabulations of corporations by size of assessed income since 1972 (see Table IA7 for detailed descriptions of the sources). We transcribe tabulations from the Yearbook of Statistics for 1972 to 2004 (Singapore Department of Statistics, 1972-2004), and obtain data directly from the Inland Revenue Authority of Singapore (IRAS) since 2005 (Inland Revenue Authority of Singapore, 2005-2007, 2008-2022). The data include both resident and non-resident corporations.

South Korea (manufacturing) Choi et al. (2024) collect data on the largest manufacturers in Korea. They kindly shared estimates of the largest 100 and 500 manufacturers by sales in total manufacturing gross output. Their data start in the 1970s and end in 2011. For 1972 to 1982, they digitize the historical Annual Reports of Korean Companies published by the Korea Productivity Center. For 1982 to 2011, they obtain data from KIS-VALUE, which covers firms with assets above 3 billion Korean Won, for whom reporting balance sheet data is mandatory.

CRx from government publications We are also able to find long-run CRx ratios directly reported for detailed manufacturing in a few instances. First, for Germany, we are able to find CR10 reported for two-digit and manufacturing industries since 1954, and for four-digit manufacturing industries since 1968. From 1954 to 1982, the data come from reports by the Federal Cartel Office and the Monopolies

Commission the German statistical office (Statistisches Bundesamt, 1985). For 1983 onwards, the data come from the German statistical office (Statistisches Bundesamt, 1986-2018). Second, for Australia, we are able to find CR20 for two-digit manufacturing industries from 1968 to 2000. The data for 1968 to 1993 come from various concentration statistics publications based on manufacturing censuses (Australian Bureau of Statistics, 1990, 1994, 1996*a*,*b*). The data for 2000 come from the annual Economic Activity Survey (Australian Bureau of Statistics, 2002).[11] In both countries, the two-digit manufacturing industries became less granular in the 1990s due to changes in industry classifications, resulting in a discontinuity in the level of CRx.

II.A.2 Size by Employment

In addition, we search for data on firm size by employment to estimate employment concentration. We collect data for in the aggregate and at the industry level when possible. We limit the industry-level breakdown to manufacturing and retail/wholesale trade, as these industries are consistently defined over time (unlike for example services). We are able to obtain long-run data for Germany (aggregate and industry level), France (aggregate only), Switzerland (aggregate and industry level), U.K. (manufacturing only), Australia (manufacturing only), Korea (manufacturing only). We also compare with U.S. data (as described in Section III.B.

Germany We use two types of tabulations by employment size for Germany. First, between 1925 and 1986, we obtain tabulations from census of establishments ("Arbeitsstättenzählung") (Statistisches Bundesamt, 1930, 1965, 1990), which was conducted at irregular intervals during this time period. We obtain physical copies of all pre-WWII census of establishment publications from the German National Library to verify the availability of firm size tabulations. PDF files for the 1950, 1961, 1970, and 1987 censuses are accessible through the statistical library of the Statistisches Bundesamt (Statistisches Bundesamt, 1965, 1990).[12] The census of establishments covers all non-agricultural enterprises and their employees.

Second, for 2003 to 2022, the data come from the company register ("Unternehmensregister") managed by the German statistical office (Statistisches Bundesamt, 2003-2022*b*), based on information from tax authorities, the federal employment agency, surveys, and commercial data providers. We obtain these tabulations from the German statistical office. The data cover non-agricultural firms. Employees include all workers after 2019, and workers subject to social security contributions (i.e., those earning above a

[11] The Industry Concentration Statistics report is also published for 1998 and 1999, but CR20 data are missing in those two years for industry "29. Other Manufacturing."

[12] No firm-level employment size tabulations are available for the 1933, 1939, and 1950 censuses.

minimum threshold) before then.[13] The narrower definition of employees between 2003 and 2018 tends to raise top employment shares by a slight amount.

France We obtain data on employment size distribution of French companies using Ministère des Finances et des Affaires Économiques (1954-2000) for 1966 (from "Fichier des Entreprises et des Établissements," an early version of the French business registry), and 1981 to 1998 (the same sources as the sales size distribution). In addition, we can find tabulations for 1973 in Brocard and Gandois (1978) and for 1975 in Brocard (1979), which are based on businesses' fiscal declarations.

Switzerland The data on Swiss employment concentration from 1929 to 2008 come from the establishment census ("Eidgenössische Betriebszählung") (Eidgenössisches Statistisches Amt, 1933, 1946, 1965, 1967, 1977; Bundesamt für Statistik, 1994, 1998, 2000, 2002, 2007). Beginning in 1929, the Swiss statistical office started recording firms according to employment size. The final edition of the establishment census was conducted in 2008, after which it was replaced by the business register Structural Business Statistics ("STATENT"). The establishment census is a nationwide survey of all establishments and firms in Switzerland, excluding agriculture. The most recent data for 2011 to 2022 come from Structural Business Statistics (STATENT), provided to us via email by the Federal Statistical Office (Bundesamt für Statistik, 2011-2022). The data cover all sectors of the economy and we exclude agriculture to ensure consistency with census data. A company that pays social security contributions on income above 2,300 Swiss Francs per year is recorded in STATENT (Bundesamt für Statistik, 2025*b*).

U.K. (manufacturing) The U.K. data on the employment size distribution come from the same sources as above: the Census of Production between 1958 and 1993 (Board of Trade, 1960-1973; Department of Industry Business Statistics Office, 1973-1992), and the Size Analyses of United Kingdom Businesses after 1985 (Department of Trade and Industry, Business Statistics Office, 1985-1997; Office for National Statistics, 1998-2003, 2004-2013, 2015-2022). We use the Census of Production data until 1993 and the Size Analyses of United Kingdom Businesses afterwards because the data from the Census of Production are more granular.

Australia (manufacturing) The Australian data on firm size by employment come from two sources. We are restricted to manufacturing because of the scope of the earlier census data. The first source is *Enterprise Statistics* by the Australia Bureau of Statistics (ABS) (Australian Bureau of Statistics, 1968-1982, 1983-1987), which are first published for the 1968–1969 integrated economic census. It is published continuously every year from 1977–1978 to 1986–1987, and apparently discontinued after that. The second source is *Australian Industry* by the ABS (Australian Bureau of Statistics, 2007), which contain the

[13] Self-employed and working owners are excluded unless registered as employees subject to social security contributions.

number of firms for small (0 to 19 employees), medium (20 to 199 employees), and large businesses (over 200 employees) and the employment of each group for 2004–2005 and 2005–2006. These employment size bins are significantly coarser than those in earlier data. Since the large business bin in these years contains about 630 manufacturing firms, we check that the top 500 share (or the top 630 share) can be reliably estimated.

Korea (manufacturing) The Korean data on corporations by the size of employment also come from Choi et al. (2024). They kindly shared estimates of the largest 100 and 500 manufacturers by employment in total manufacturing employment.

II.B Estimating Top Shares

We estimate the share of top companies from size bins in the tabulations. Our baseline method uses the generalized Pareto interpolation (Blanchet, Fournier, and Piketty, 2022), which is also the baseline in Kwon, Ma, and Zimmermann (2024). This method is the standard approach developed to estimate household top income shares from income bins with a similar format (Blanchet, Fournier, and Piketty, 2022; Piketty and Saez, 2003). The generalized Pareto interpolation starts by calculating the inverted Pareto coefficient $b(p_i)$ for each bin threshold y_i, where p_i is the fraction of firms with size above y_i, and $b(p_i)$ is the ratio between the average size above y_i and the threshold y_i. It then fits a continuous curve of inverted Pareto coefficients. In Kwon, Ma, and Zimmermann (2024), we verified that the generalized Pareto interpolation gives almost identical results to interpolating lognormal curves, or directly adding up the top bins such that the number of businesses in these bins approximates a certain amount (e.g., top 1%).

Most tabulations provide both the number of companies and their total size for each size bin. In this case, we can apply the generalized Pareto interpolation directly. For U.K. data by size of sales after 1985, the tabulations only show the number of companies in each size bin, but not their total size. In this case, we can still use the generalized Pareto interpolation, but estimates can be less precise. We use the average firm size (for all firms) to provide additional disciplining information for the interpolation, which tends to improves the fit.

II.C Top Percent Shares and Top N Shares

We provide results using both top percent shares (e.g., top 1%) and top N shares.

Top percent shares We start with the top 1% and the top 0.1% shares. The benchmark for evaluating the disparity of business size is the top percent share in a number of models (Aghion et al., 2023; Hsieh and

Rossi-Hansberg, 2023). Analyzing top percentiles is also the standard approach in research on household income and wealth inequality.

Moreover, the top percent share has several practical advantages. First, it is portable across different countries that differ a lot in size, and across different levels of aggregation (e.g., the overall economy versus a particular industry). In comparison, picking the right N across these different settings is challenging and likely arbitrary. Second, for countries where we only have tabulations among corporations, the total size of corporations in the denominator can change as the prevalence of corporations changes over time. For the top percent share, the numerator is allowed to expand (shrink) when corporations become more (less) common, so it is not sensitive to shifts in the prevalence of corporations. For the top N share, the numerator does not adjust, and the top N share among corporations can move around due to the changing prevalence of corporations. In Kwon, Ma, and Zimmermann (2024), we show that in the U.S., the top N share among all businesses, the top x% share among all businesses (with a corresponding percentile), and the top x% share among corporations have very similar behavior, whereas the top N share among corporations can behave differently in settings that experience changes in the prevalence of corporations.

One common concern about the top percent shares is that they might be affected by small and extraneous firms coming in or out of the sample (therefore changing the total number of firms). Specifically, if small and extraneous firms come in (out) of the data, the total number of firms in the top 1% will increase (decrease). Thus the top 1% share can increase (decrease), as the small firms have little impact on the total value of the denominator while the numerator will include more (fewer) firms. To make sure our results are not affected by this issue, we also calculate the top x% as a fraction of the top y% (e.g., the top 1% as a share of the top 10%), and present the results in Internet Appendix IA1. One can show that for Pareto distributions, this relative share only depends on x/y and the tail coefficient k. In other words, top 1%/top 10% $=$ top $0.01N$/top $0.1N$ is invariant to the total number of firms N.

Top N shares We present top N shares as well. We generally use top 500 share as the focal example. Fixing the same N across different settings is inevitably arbitrary, and it can make the levels harder to interpret and compare across settings. There is no clear optimal rule for choosing the right N, which is one limitation of this approach.

The top N share is relatively straightforward to implement in countries where we have tabulations for all types of companies. It is trickier in countries where we only have tabulations of corporations, as mentioned above. In this case, to minimize the impact of the changing prevalence of corporations versus noncorporations on the denominator, we use the estimated size of all businesses for the denominator of the top N share. Specifically, we start with the total size of corporations, and estimate the share of corporations in total businesses. We explain this procedure in detail when we present the top N shares.

III Main Facts

We present the main results for top business shares in this section. We analyze concentration by sales and net income in Section III.A, and concentration by employment in Section III.B.

III.A Concentration by Sales and Net Income

In Section III.A.1, we study long-run concentration trends in the aggregate and broad sectors, for which we can find the most amount of data. In Section III.A.2, we study CRx ratios in detailed industries in settings where such data are available.

III.A.1 Aggregate and Broad Sectors

We start with the top 1% share, and then proceed to top N shares. To facilitate visualization, we use blue lines with circles for top shares by sales, green lines with triangles for top shares by net income, and red lines with diamonds for top shares by capital.

Top percent shares The left panel of Figure 1 shows the top 1% share by size of sales in Germany. The middle panel shows the results for Austria. The right panel shows the results for France. Figure IA2 shows the corresponding top 0.1% share. We observe steady increases of the top shares throughout the 20th century. The share of the large 1% (0.1%) companies by sales was around 0.4 (0.2) in the 1920s, around 0.6 (0.4) by the 1970s, and around 0.7 (0.5) by the 2010s. For France, recent work such as Lashkari, Bauer, and Boussard (2024) and Liebersohn and Lyonnet (2024) suggests that sales concentration has continued to increase after the end of our series (these papers focus on nonfinancial industries whereas the historical publications include finance).

In addition to aggregate tabulations, German data also provide industry level tabulations in a largely consistent way over our sample period. Figure IA1 presents the top 1% sales share for three main sectors: manufacturing, services, and trade (retail and wholesale). In each sector, we estimate the share of the largest companies by sales in total sales. The industry level series have a few discontinuities due to changes in industry definitions. We observe rising top shares over the long run at the industry level as well. Consistently available industry level data are sparse for most other countries, except for U.K. and Korea where long-run data are mainly available for manufacturing.

Figure 2 turns to the top 1% share for Denmark in the left panel and Switzerland in the right panel. Figure IA3 shows the corresponding top 0.1% share. Both countries have data on the size of corporations

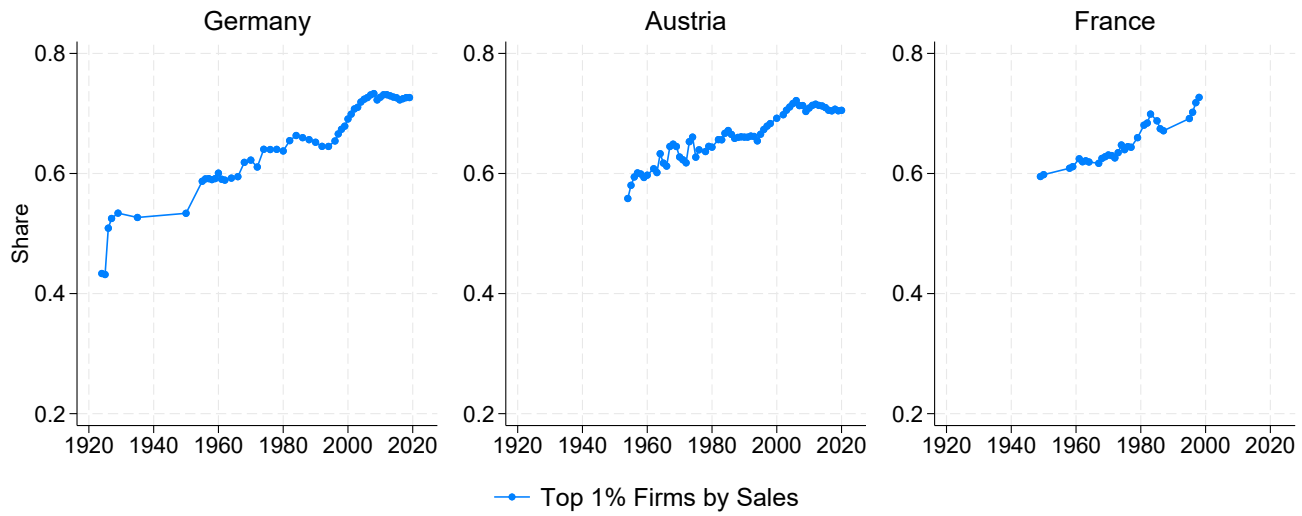


Figure 1. Germany, Austria, and France: Top 1% Sales Share

Notes: This figure shows the sales shares of the top 1% companies by sales for Germany (left panel), Austria (middle panel), and France (right panel). See Internet Appendix IA2.2, IA2.5, and IA2.6 for details about variable construction.

by equity capital until the 1980s (red line with diamonds), and the size of all types of companies by sales afterwards (blue line with circles). We observe a general increase in the top 1% (0.1%) share by capital among corporations from around 0.4 (0.1) in the early 1900s to around 0.6 (0.35) by the 1980s, and a continued increase in the top 1% (0.1%) share by sales among all types of companies since the 1980s and 1990s. In the years where top shares by capital and by sales are both available (or the two series nearly overlap), their levels are fairly similar. The additional data point of sales concentration in Switzerland in 1965 further confirms the long run trend. The slight discontinuity in top shares in Denmark around 2000 is due to the change in data coverage in the pre- and post-2000 sources (Danmarks Statistik, 2020).

Figure 3 turns to the top 1% share for the U.K., where we are only able to construct long time series of top shares consistently for manufacturing. Figure IA4 shows the corresponding top 0.1% share. The dark blue diamonds use tabulations of firm size by net output from the Census of Production. The light blue circles use tabulations of size by sales form the Great Britain Business Statistics Office. In the latter case, the tabulations only present the number of firms in each size bin (as well as overall sales), but not sales by size bin. The algorithm of Blanchet, Fournier, and Piketty (2022) still allows us to estimate top shares in this case, but these estimates can be less precise. Therefore, we consider the top sales share estimates to be preliminary and suggestive. In Figure 3, we observe that the top 1% (0.1%) net output share increased from around 0.6 (0.3) in the late 1950s to around 0.7 (0.4) in the 1980s, and the top sales share increased mildly between the 1980s and the 2010s. The rise in top shares appears stronger before the 1980s. In our analyses of U.S. data, we also observe that rising top shares in manufacturing was stronger before the 1980s and weaker afterwards (Kwon, Ma, and Zimmermann, 2024).

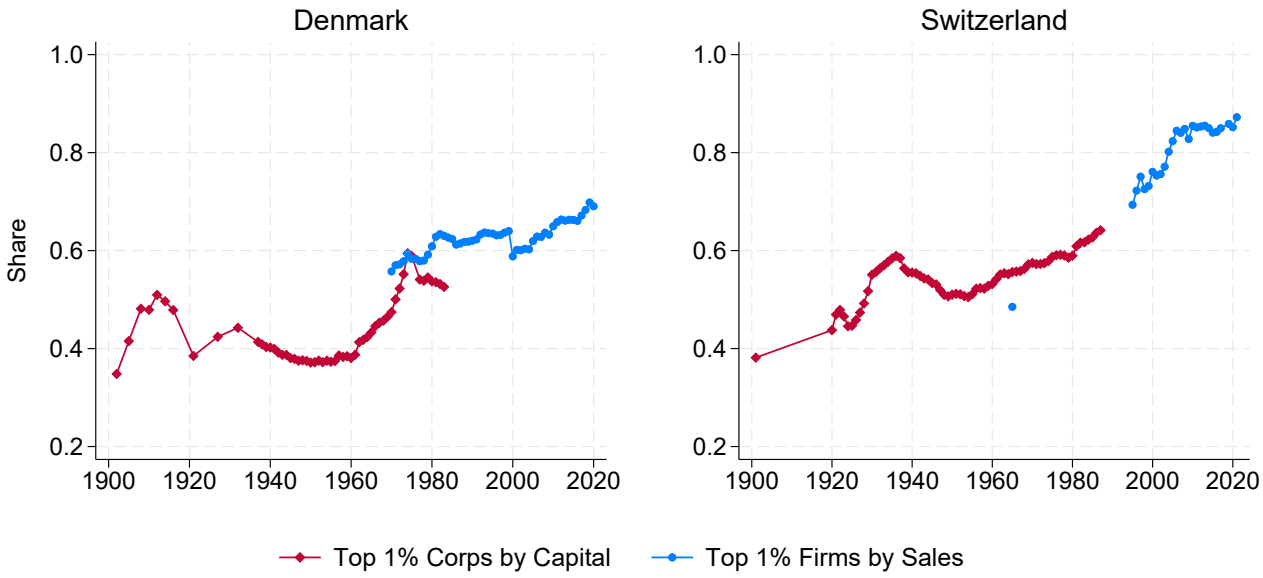


Figure 2. Denmark and Switzerland: Top 1% Share

Notes: The red line with diamonds shows the capital shares of the top 1% corporations by capital for Denmark (left panel) and Switzerland (right panel). The blue line with circles shows the sales share of the top 1% companies by sales for Denmark (left panel) and Switzerland (right panel). See Internet Appendix IA2.4 and IA2.8 for details about variable construction.

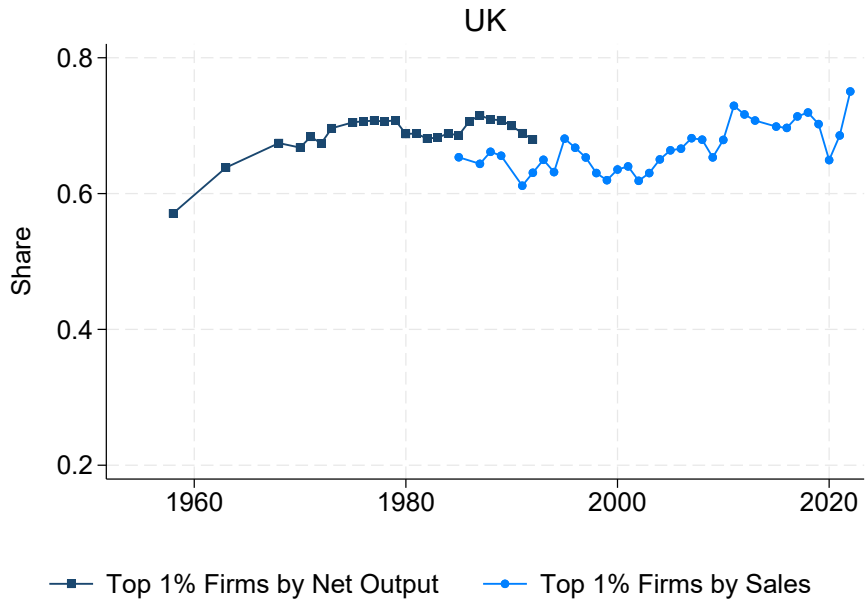


Figure 3. U.K. (Manufacturing): Top 1% Sales Share

Notes: The dark blue line with diamonds shows the net output shares of the top 1% U.K. manufacturers by net output. The light blue line with circles shows the sales share of the top 1% U.K. manufacturers by sales. See Internet Appendix IA2.9 for details about variable construction.

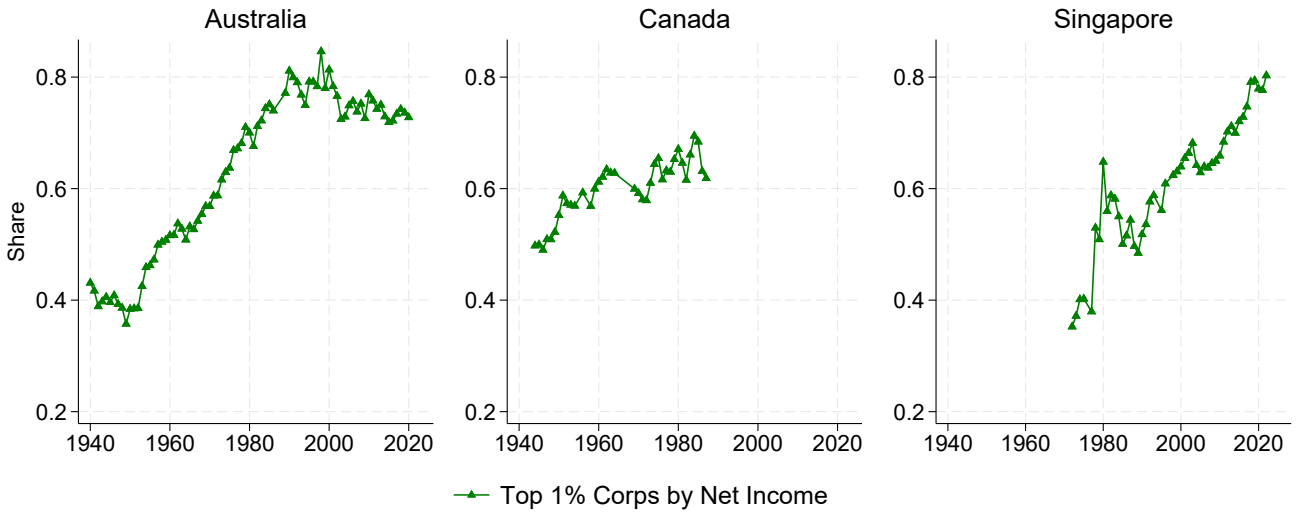


Figure 4. Australia, Canada, and Singapore: Top 1% Share

Notes: The green line with triangles shows the net income shares of the top 1% corporations by net income for Australia (left panel), Canada (middle panel), and Singapore (right panel). See Internet Appendix IA2.1, IA2.3, and IA2.7 for details about variable construction.

Figure 4 shows the top 1% share for Australia (left panel), Canada (middle panel), and Singapore (right panel). Figure IA5 shows the corresponding top 0.1% share. These countries have data on corporations by size of net income, and we need to restrict to businesses with positive net income. We observe rising top shares over the long run. For Australia and Canada, the top 1% (0.1%) net income share among corporations started at around 0.4 (0.2) in the 1940s, increased to around 0.6 (0.4) around the 1980s, and Australian data show continued increase to around 0.8 (0.6) by 2000 (after which the Australian top shares have been relatively flat and Canadian data currently end in 1987). For Singapore, the top 1% (0.1%) net income share among corporations increased from around 0.4 (0.15) in the early 1970s to around 0.8 (0.6) in recent years. Indeed, the path of Singapore looks similar to that of Australia and Canada, just 20 years later given its economic development started more recently.

Top N shares The top N shares are relatively straightforward to implement in settings where we have data from all types of companies. It is trickier to implement in settings where we only have comprehensive data on corporations: Denmark and Switzerland in earlier years, as well as Australia, Canada, and Singapore. Two issues arise in these settings.

First, for the denominator, the total size of corporations is affected by the changing prevalence of corporations (which tends to increase over time in most countries). For example, as corporations become more common, the denominator (the total size of corporations) expands. For the top percent share, the numerator is allowed to expand (shrink) when corporations become more (less) common, so it is not sensitive to shifts in the prevalence of corporations. For the top N share, the numerator does not adjust,

and it can move around due to the changing prevalence of corporations. In Kwon, Ma, and Zimmermann (2024), we show that in the U.S., the top N share among all businesses, the top $x\%$ share among all businesses (with a corresponding percentile), and the top $x\%$ share among corporations have very similar behavior, whereas the top N share among corporations can behave differently in settings that experience changes in the prevalence of corporations.

To minimize the impact of the changing prevalence of corporations on the denominator, we use the estimated *the size of all businesses for the denominator of the top N share*. Specifically, we start with the total size of corporations, and estimate the share of corporations in total businesses. This denominator adjustment proceeds as follows:

- All countries with by net income tabulations (Australia, Canada, and Singapore): We estimate the corporate share using corporate value added to private business value added. We discuss the procedures in detail in Appendix IA2.1, IA2.3, and IA2.7. Figures IA10, IA12, and IA17 show the estimates for Australia, Canada, and Singapore, respectively.

- Denmark by capital tabulations: For 1948 to 1983, we use the share of corporate sales in total business sales available from Statistics Denmark and Census publications (Danmarks Statistik, 1984-1987). Before 1948, we are able to obtain estimates of the share of corporate employment in total business employment among industrials from the manufacturing census (Danmarks Statistik, 1908-1914, 1925-1948). Figure IA14 shows these two series. They are both available in 1948, in which case they align closely.

- Switzerland by capital tabulations: We can find the share of corporate employment in total business employment for benchmark years dating back to 1929 (Eidgenössischen Statistischen Amt, 1933-1998). We linearly interpolate the missing years. Before 1929, we rely on the proportion of joint stock corporations among all registered businesses from the Historical Statistics of Switzerland (Eidgenössisches Statistisches Amt, 1934). Figure IA19 shows these two series.

Second, for the numerator, we can only use the top N *corporations* in these settings. Accordingly, we may underestimate the top N share if some of the largest businesses are noncorporations.

As mentioned earlier, another challenge for the top N share is that we need to pick the N across different settings. The countries in our dataset differ substantially in size. We use the top 500 share as a focal example. If the bins are coarse and the top bin contains a large number of companies, we may need to use a larger N.

Figure 5 starts with Germany (left panel), Austria (middle panel), and France (right panel). These

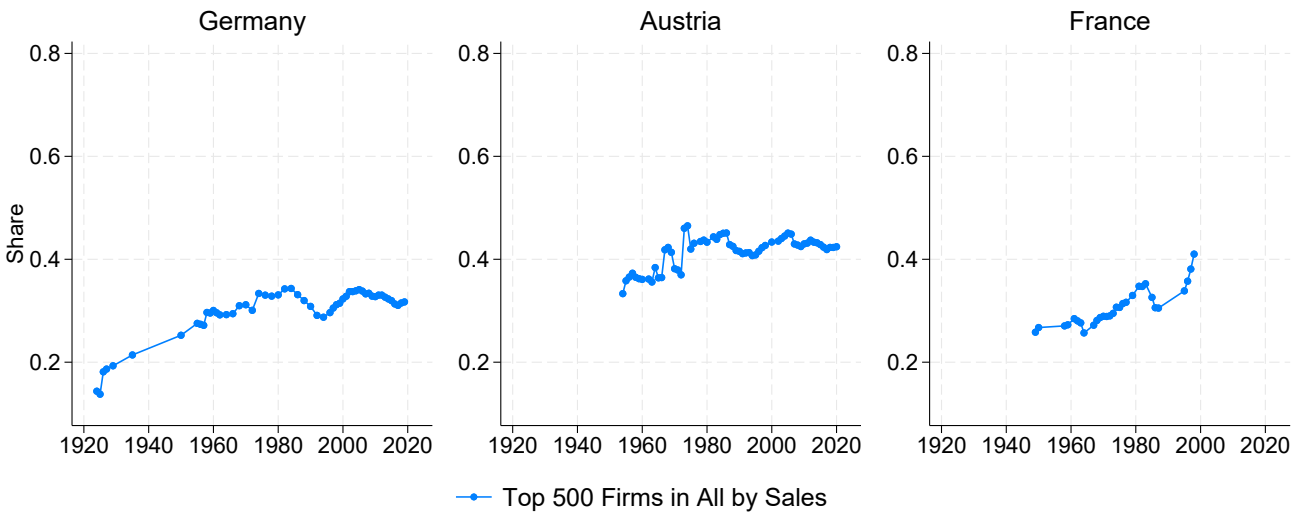


Figure 5. Germany, Austria, and France: Top 500 Sales Share

Notes: This figure shows the sales shares of the top 500 companies by sales for Germany (left panel), Austria (middle panel), and France (right panel). See Internet Appendix IA2.2, IA2.5, and IA2.6 for details about variable construction.

countries have data on size by sales for all types of companies, so the top N shares can be reliably estimated. We observe that the top 500 sales share among German, Austrian, and French firms has increased over the long run. Panel B of Figure IA1 shows the top 500 share in three main sectors for Germany, which has increased over the long run at the industry level as well.

Figure 6 turns to Denmark and Switzerland. Both countries have data on the size of all types of companies by sales in recent decades (blue line with circles), in which case the top N shares can be reliably estimated. Both countries have data on the size of corporations by capital until the 1980s (red line with diamonds). For the denominator, we estimate the size of all businesses using the procedures described above: we take the total size of corporations and divide by the estimated corporate share in total businesses. For the numerator, we can only draw from corporations (hence the label writes "Corps in All"). For Denmark, these two types of series have similar levels in years where they overlap. They both increase over the long run. For Switzerland, the top N share by sales is higher, and the long run increase of the top share is evident for both types of data as well. The additional data point of sales concentration in 1965 further confirms the long run trend.

Figure 7 shows the top N shares estimated among U.K. manufacturers. The left panel uses the top 100 share because Prais (1976) provides extended estimates for the share of the 100 largest enterprises in manufacturing net output from 1909 to 1970. Over that period, the estimated top 100 share increased from 16% to 40%. We use U.K. census data to extend the top 100 share in manufacturing net output to 1992. The top 100 share stayed around the same in those two decades. For the post-1985 period where we

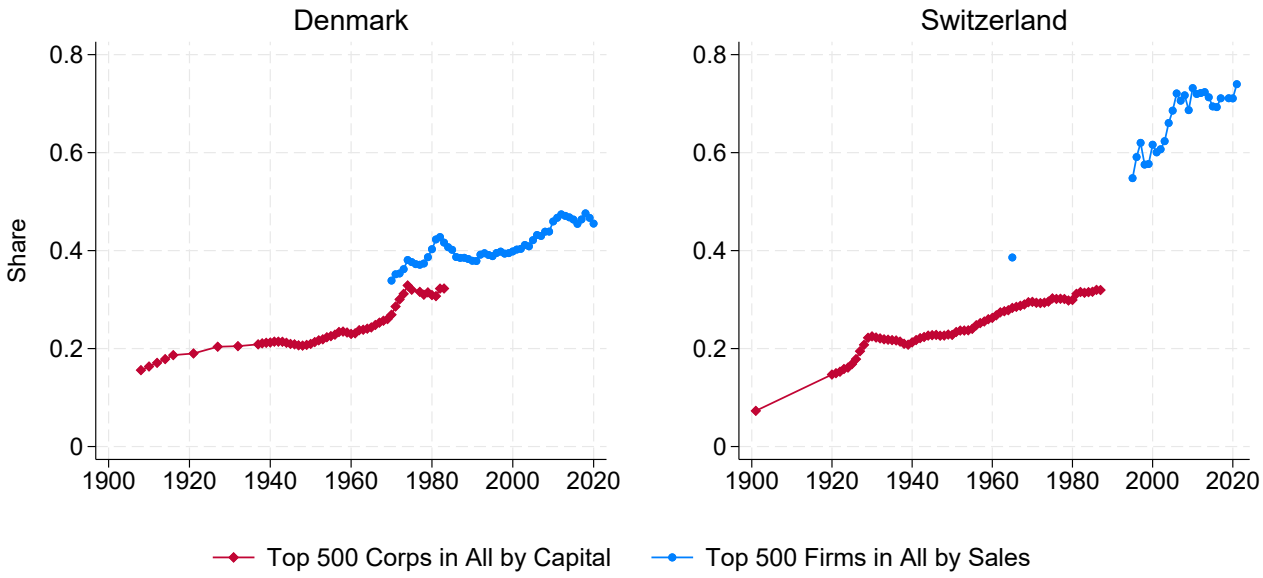


Figure 6. Denmark and Switzerland: Top 500 Share

Notes: The red line with diamonds shows the capital shares of the top 500 corporations by capital in estimated corporate and noncorporate capital for Denmark (left panel) and Switzerland (right panel). The blue line with circles shows the sales share of the top 500 companies by sales for Denmark (left panel) and Switzerland (right panel). See Internet Appendix IA2.4 and IA2.8 for details about variable construction.

have size bins by sales, the tabulations are not granular enough to estimate the top 100 share. The right panel shows the estimated top 5,000 share by sales, together with the top 5,000 share by net output since 1958. We use the top 5,000 share here because the bins for the tabulations by sales are coarse. In addition, as mentioned earlier, these tabulations only present the number of firms in each bin (as well as the overall sales), but not sales by size bin. Therefore, we consider the top sales share estimates to be preliminary and suggestive. In Figure 7, like in Figure 3, the top share is relatively flat after the 1970s. These patterns are in line with what we observe in the U.S. manufacturing sector in Kwon, Ma, and Zimmermann (2024): the top share increased a fair amount before the 1980s and not much afterwards (after the 1970s/1980s, we primarily observe rising concentration in services and retail/wholesale trade in U.S. data).

Figure 8 turns to Australia (left panel), Canada (middle panel), and Singapore (right panel). These countries have data on the size of corporations by net income. As before, we restrict to corporations with positive net income. For the denominator, we estimate the size of all businesses using the procedures described above: we take the total size of corporations and divide by the estimated corporate share in total businesses. For the numerator, we can only draw from corporations (hence the label writes "Corps in All"). We again observe rising top shares over the long run.

Figure 9 shows the share of the largest 100 and 500 manufacturers by sales in total manufacturing gross output in Korea, estimated by Choi et al. (2024). In these data, we observe that the top 100 (500) sales

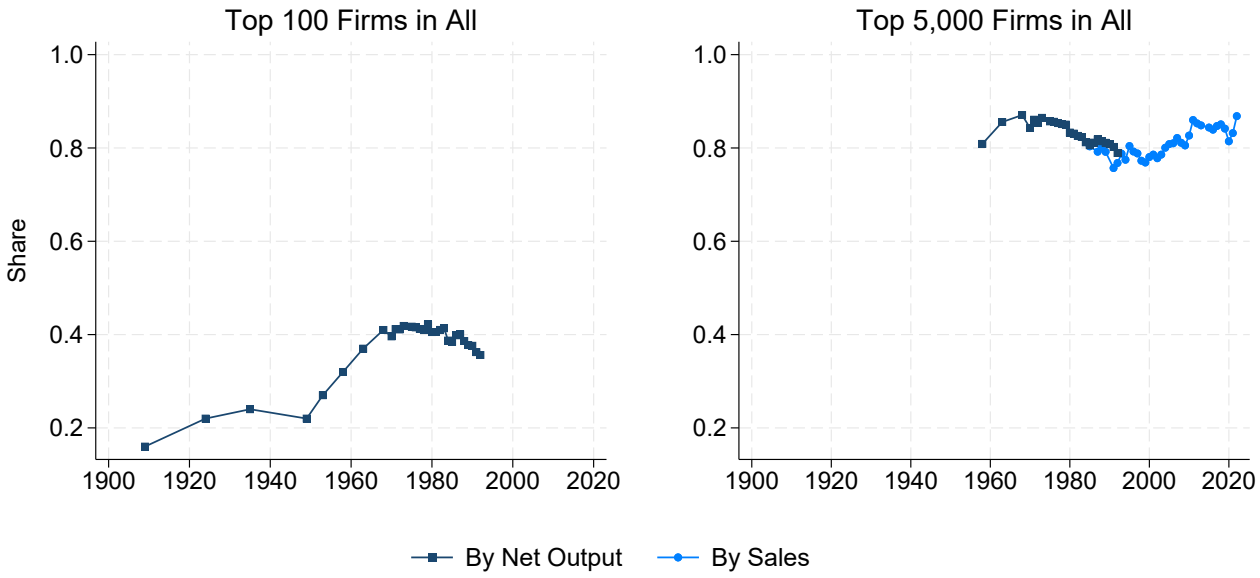


Figure 7. U.K. (Manufacturing): Top N Share

Notes: The dark blue line with diamonds shows the net output shares of the top 100 (left panel) and the top 5,000 (right panel) British manufacturers by net output. The light blue line with circles shows the sales share of the top 5,000 British manufacturers by sales. See Internet Appendix IA2.9 for details about variable construction.

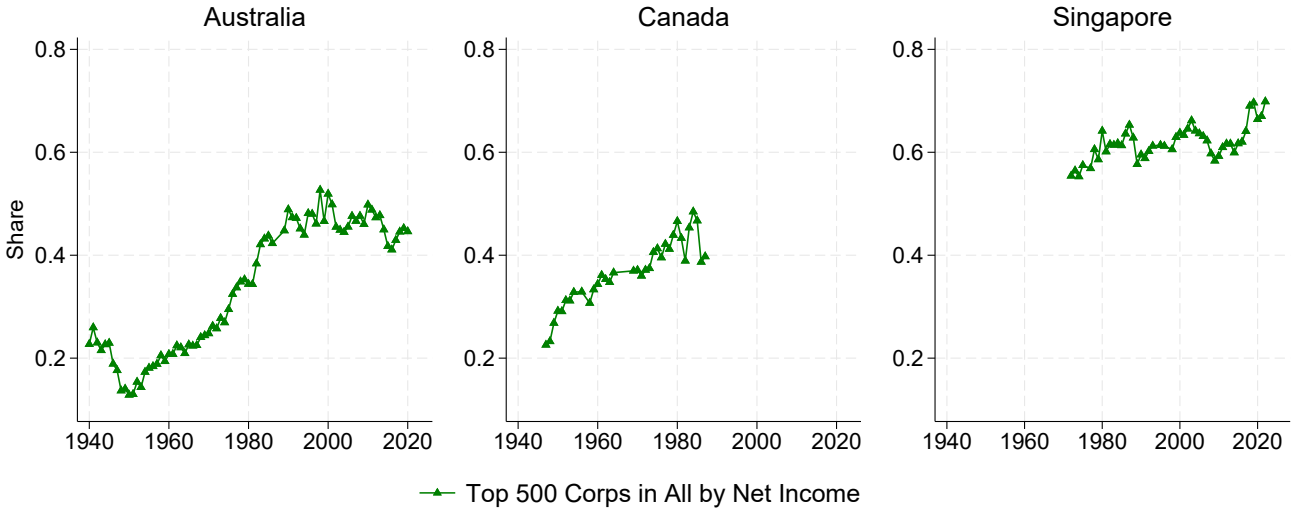


Figure 8. Australia, Canada, and Singapore: Top 500 Share

Notes: The green line with triangles shows the net income shares of the top 500 corporations by net income for Australia (left panel), Canada (middle panel), and Singapore (right panel). See Internet Appendix IA2.1, IA2.3, and IA2.7 for details about variable construction.

share in manufacturing increased from around 20% (30%) in the 1970s to around 45% (55%) by the early 2010s.

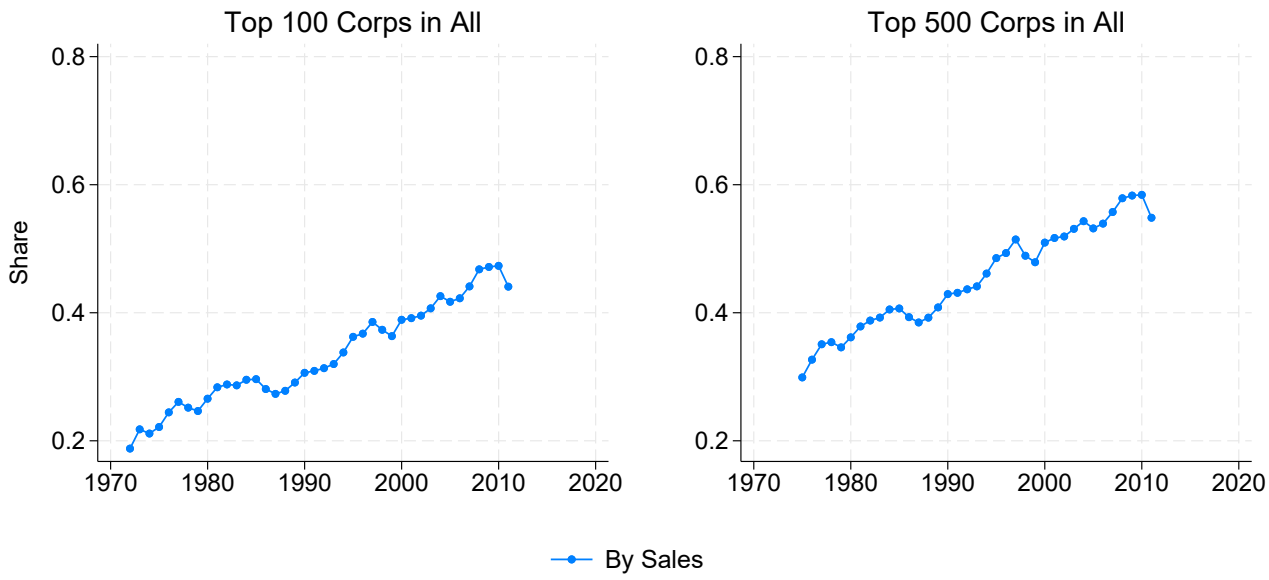


Figure 9. Korea (Manufacturing): Top N Share

Notes: The blue line with circles shows the sales share of the largest 100 and 500 manufacturers by sales in total manufacturing gross output in Korea. See Internet Appendix IA2.7 and Choi et al. (2024) for details about variable construction.

III.A.2 Detailed Industries

We also search for data for detailed industries. In Germany, we are able to find CR10 for two-digit and manufacturing industries since 1954, and for four-digit manufacturing industries since 1968, shown in Panel A of Figure 10. The data come from reports by the Federal Cartel Office, the Monopolies Commission, and the German statistical office (Statistisches Bundesamt, 1985, 1986-2018). In Australia, we are able to find CR20 for two-digit manufacturing industries from 1968 to 2000, shown in Panel B of Figure 10. Data come from various manufacturing census reports and concentration report (Australian Bureau of Statistics, 1990, 1994, 1996*a*,*b*, 2002). In both countries, the two-digit manufacturing industries became less granular in the 1990s due to changes in industry classifications, so the CRx ratios are lower after the change. The solid blue line with circles presents the equal weighted average of the CRx ratio among detailed industries. The dashed red line with diamonds presents the sales weighted average. Overall, we observe long-run increases in the CRx ratios.

III.B Concentration by Employment

In this section, we turn to concentration by employment, for which we can obtain long-run data for several countries described in Section II.A.2. Figure 11 shows the top 1% share by employment in Panel A, and the top 500 share in Panel B. We observe that employment concentration is stable in the

Panel A. Average CR10 Ratios in German Manufacturing



Panel B. Average CR20 Ratios in Australian Manufacturing

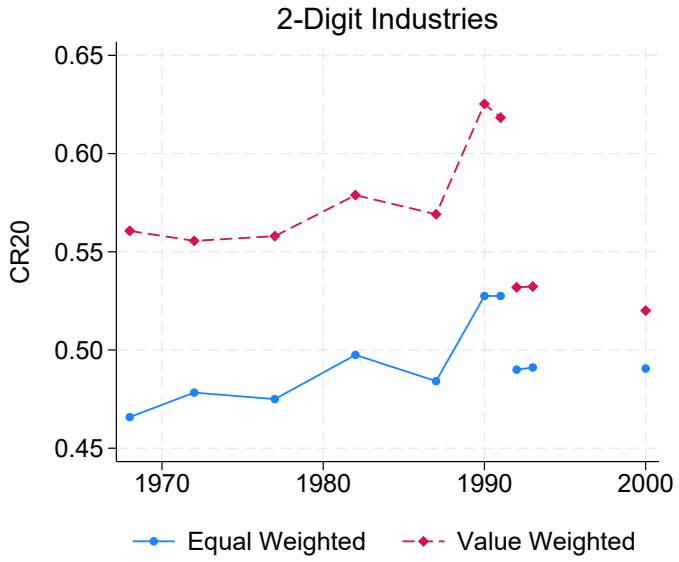


Figure 10. CRx Ratios from Government Publications

Notes: Panel A shows CR10 for Germany from reports by the Federal Cartel Office, the Monopolies Commission, and the German statistical office. Industry classifications were revised between 1994 and 1995, and between 2008 and 2009. Comparisons across these periods should be made with caution. These discontinuities are reflected in the graph by the absence of connecting lines between these years. Panel B shows CR20 for Australia from manufacturing census. Industry classifications were revised between 1991 and 1992, leading to fewer 2-digit manufacturing industries. The data source changed for the 2000 data point. Comparisons across these periods should be made with caution. The solid blue line with circles shows the equal weighted average. The dashed red line with diamonds shows the sales weighted average.

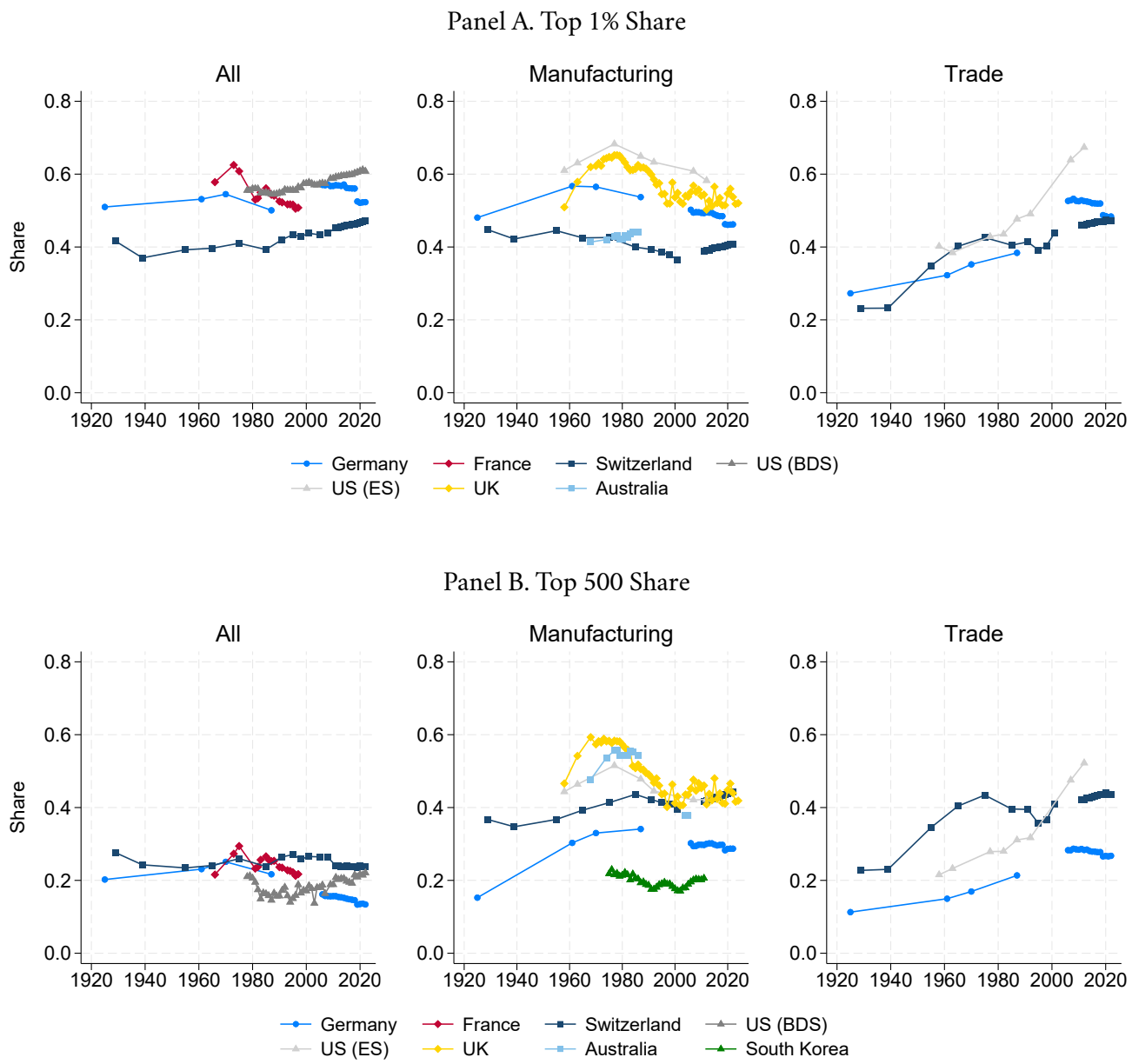


Figure 11. Employment Concentration

Notes: This figure shows the employment shares of the top 1% companies by employment in Panel A, and the employment shares of the top 500 companies by employment in Panel B. See Internet Appendix IA2.1, IA2.5, IA2.6, IA2.8, IA2.9 for details about variable construction.

aggregate and in manufacturing, even declining in some cases, such as France, U.K. manufacturing, and Australian manufacturing since the 1980s. The exception is retail/wholesale trade, where the employment concentration has increased in the countries where we have long-run data.

U.S. data for firm size distribution by employment are available from Census Business Dynamic Statistics (BDS) since 1978 (U.S. Census Bureau, 2022). Aggregate top shares using BDS data are plotted

in Figure 11 as well.[14] In addition, we are able to find consistent tabulations of firm size distribution for manufacturing and retail/wholesale trade since 1958 from Census Enterprise Statistics publications (U.S. Department of Commerce, 1963, 1972*a*,*b*, 1981, 1986-2012); other industries such as services are not consistently covered. These series show modest increases in employment concentration in the aggregate, a slight U-shape pattern in manufacturing (similar to U.K. and Australia), and sustained increases in trade (similar to Germany and Switzerland). Several studies have noted that concentration by employment U.S. data appear more stable than concentration by sales (Luttmer, 2010; Autor et al., 2020). Relatedly, Barkai and Panageas (2025) find that young firms in the U.S. have declining contribution to employment but not to sales, and attribute this phenomenon to the rise of "low marginal and high average" revenue-product-of-labor firms.

Why does sales concentration increase substantially while employment concentration is relatively stable? One possibility is large firms expand their scale using capital (physical or intangible) rather than labor. Declining capital price over time—correspondingly rising capital productivity—can stimulate more automation, especially among large firms as they are more inclined to pay the automation cost (Hubmer and Restrepo, 2024). It can also reallocate towards capital intensive firms (Desazars, 2025). Accordingly, large firms expand their sales but do not necessarily hire more people. The expansion of employment can be stronger, such as in trade, if the elasticity of substitution between capital and labor is smaller in this sector. Several papers point out that firms in trade grow by having more establishments (Rossi-Hansberg, Sarte, and Trachter, 2021; Hsieh and Rossi-Hansberg, 2023; Smith and Ocampo, 2025), and each establishment may require some minimum amount of employees.

Another possibility is sales are increasingly reallocated towards high markup firms (Autor et al., 2020). In the framework of Autor et al. (2020), large high markup firms have high overall productivity (and therefore high labor productivity), so reallocation towards them should raise employment concentration as well (even though the increase would be less than that in sales concentration). Other mechanisms, including changes in barriers to entry or trade costs (Melitz, 2003; Hopenhayn, Neira, and Singhania, 2022), also generally predict increases in both sales and employment concentration.

Finally, a common hypothesis is the divergence of sales concentration and employment concentration trends could result from large firms outsourcing their production to other firms or overseas. In this case, we would expect the ratio of sales (gross output) to GDP (value added should increase. If firms outsource employment internationally, value added of domestic production should decrease relative to sales. If firms

[14] Industry-level employment concentration is difficult to construct using public BDS data because the size bins are based on the total employment of the firm, whereas the reported employment is restricted to the specific industry (see https://www.census.gov/library/working-papers/2021/adrm/CES-WP-21-08.html). Accordingly, the reported employment often appears too small relative to the size bin.

outsource to others domestically, total value added stays the same and total sales should increase as there are more sales from the intermediate steps. In the data, we observe stable ratio of domestic sales (gross output) to GDP (value added), as shown in Appendix IA2. Accordingly, it seems unlikely that our findings are driven by outsourcing the production of intermediate goods.

IV Conclusion

We collect long-run data on the firm size distribution in a variety of countries with available information. We find that the rise of big businesses is a pervasive phenomenon over the past century. Large organizations have become more prominent in market-based economies around the world.

The pervasiveness of this phenomenon suggests that a full account about the underlying mechanisms needs to apply broadly (not just to the U.S. in the recent decades). Over the past two centuries, several authors have hypothesized that technological or managerial development may lead to inevitable increases in the prominence of large organizations (Marx, 1867; Marshall, 1890; Lenin, 1916; Lucas, 1978). The long-run evidence from around the world makes it even more intriguing to contemplate their hypotheses, and to revisit the age-old question of organizing production through markets versus organizations (Coase, 1937; Hayek, 1945; Arrow, 1974).

A common question is whether the largest firms have stayed the same. The firm size tabulations that cover the entire economy do not disclose information about individual firms. Ma, Pugsley, and Zimmermann (2024) hand collect data about the identity of the largest firms in the U.S., Germany, and the U.K. They find that the individual companies at the top have changed substantially over time. In other words, the largest firms in the economy have become more prominent, but they are by and large not the same firms.

The rise of large organizations in production activities has a wide range of implications. Several studies point out that the firm size distribution affects the determinants of macroeconomic outcomes. In general, higher production concentration increases the aggregate impact of large firms' shocks (Gabaix, 2011), innovation (Braguinsky et al., 2023), operations and management (Berle and Means, 1932), and financing conditions (Crouzet and Mehrotra, 2020). The general public has also been concerned about the political power of the large firms, which poses another interesting question.

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Internet Appendix

IA1 Additional Results



Figure IA1. Germany: Industry Level Top Shares

Notes: This figure shows the sales shares of the top 1% (Panel A) and the top 500 (Panel B) firms in manufacturing, services, and retail/wholesale trade for Germany. See Internet Appendix IA2.6 for details about variable construction.

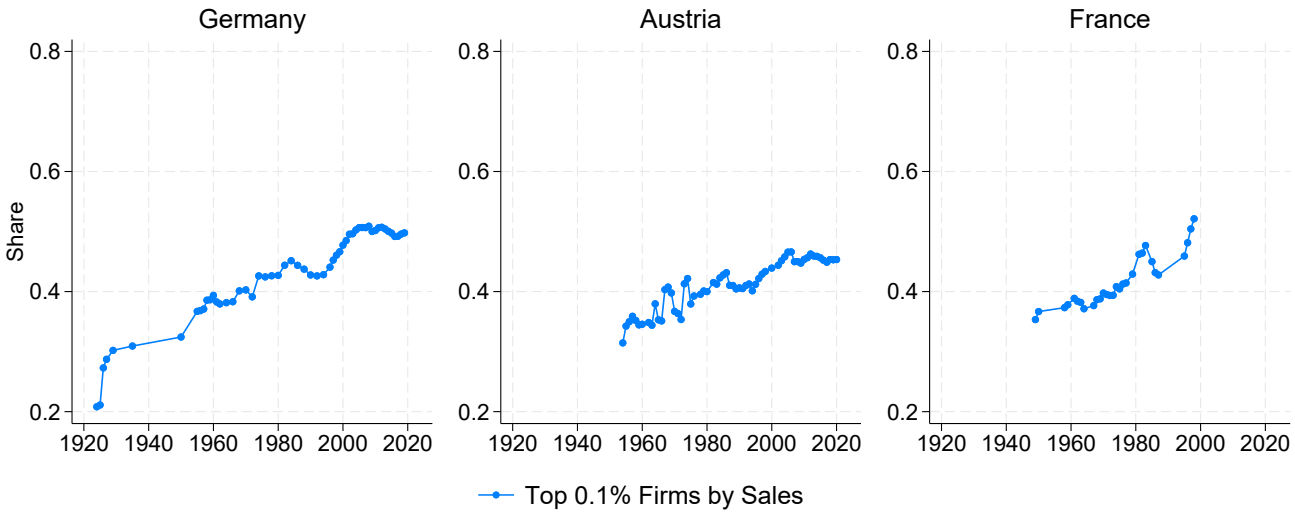


Figure IA2. Germany, Austria and France: Top 0.1% Sales Share

Notes: This figure shows the sales shares of the top 0.1% companies by sales for Germany (left panel), Austria (middle panel) and France (right panel). See Internet Appendix IA2.2, IA2.5 and IA2.6 for details about variable construction.

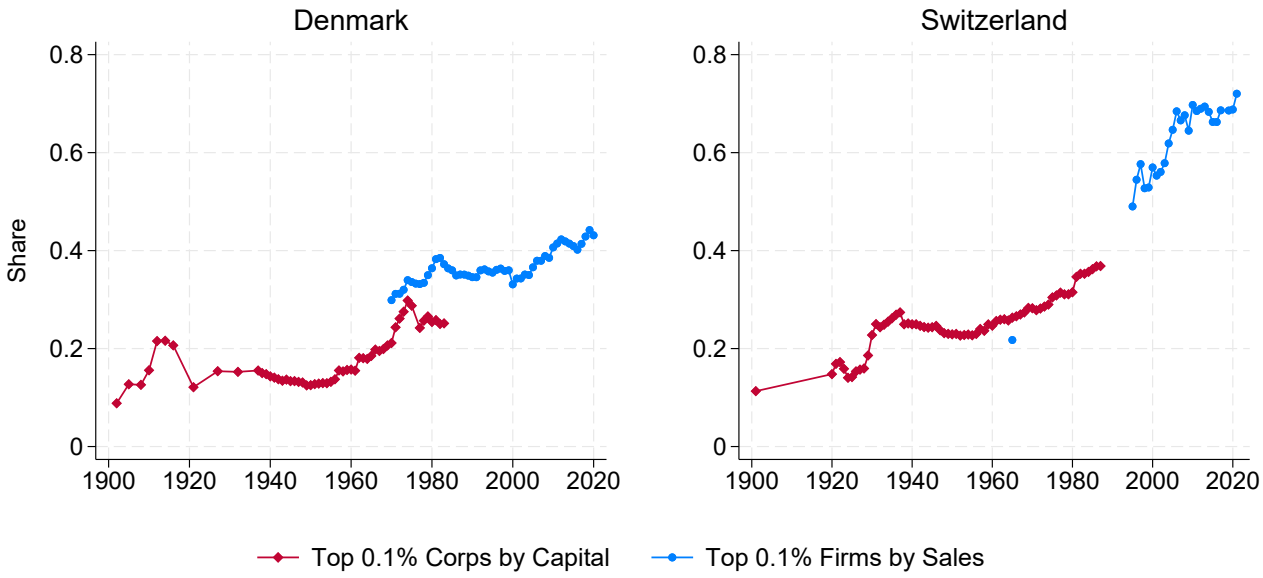


Figure IA3. Denmark and Switzerland: Top 0.1% Share

Notes: The red line with diamonds shows the capital shares of the top 0.1% corporations by capital for Denmark (left panel) and Switzerland (right panel). The blue line with circles shows the sales share of the top 0.1% companies by sales for Denmark (left panel) and Switzerland (right panel). See Internet Appendix IA2.4 and IA2.8 for details about variable construction.

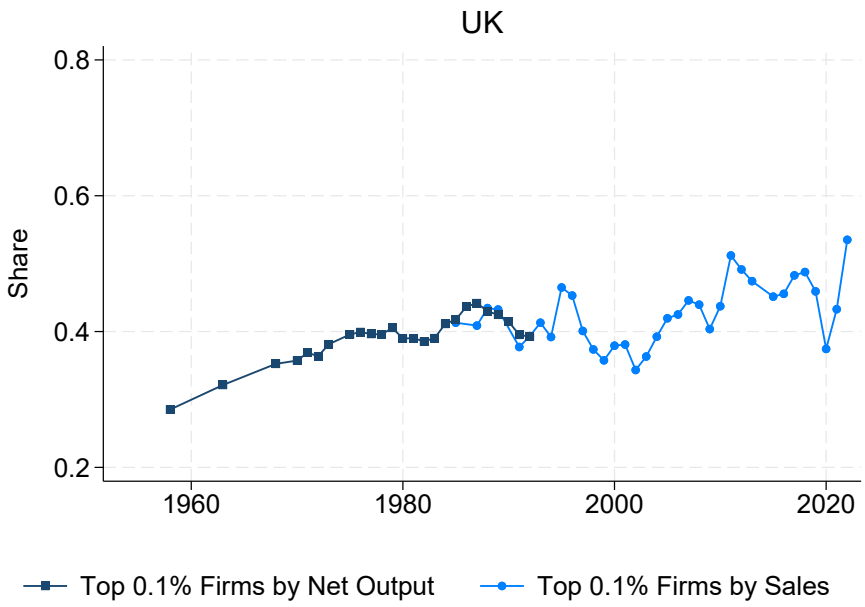


Figure IA4. U.K. (Manufacturing): Top 0.1% Sales Share

Notes: The dark blue line with diamonds shows the net output shares of the top 0.1% U.K. manufacturers by net output. The light blue line with circles shows the sales share of the top 0.1% U.K. manufacturers by sales. See Internet Appendix IA2.9 for details about variable construction.

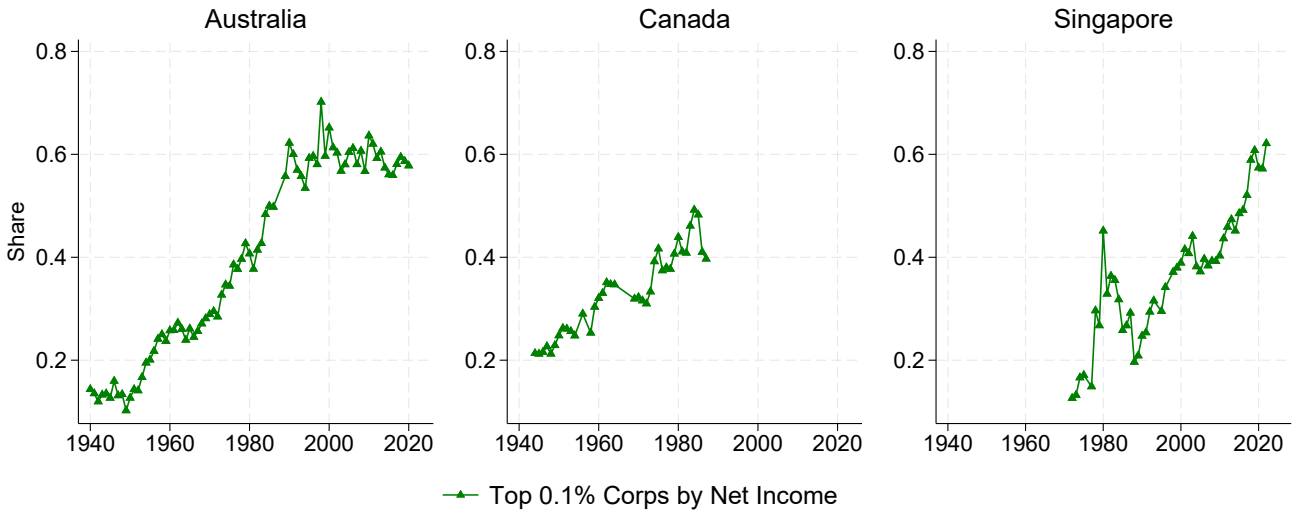


Figure IA5. Australia, Canada, and Singapore: Top 0.1% Share

Notes: The green line with triangles shows the net income shares of the top 0.1% corporations by net income for Australia (left panel), Canada (middle panel), and Singapore (right panel). See Internet Appendix IA2.1, IA2.3, and IA2.7 for details about variable construction.

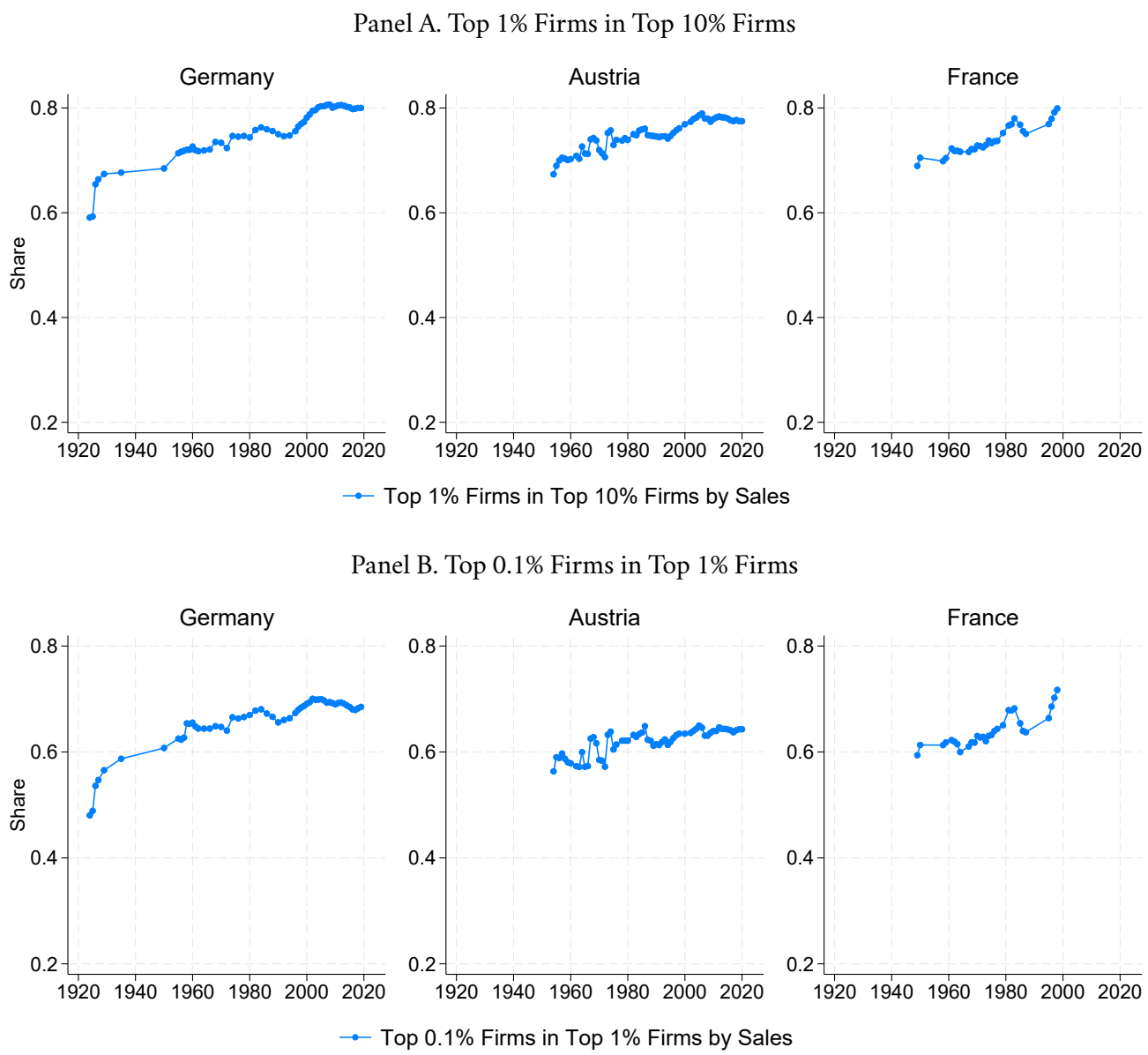
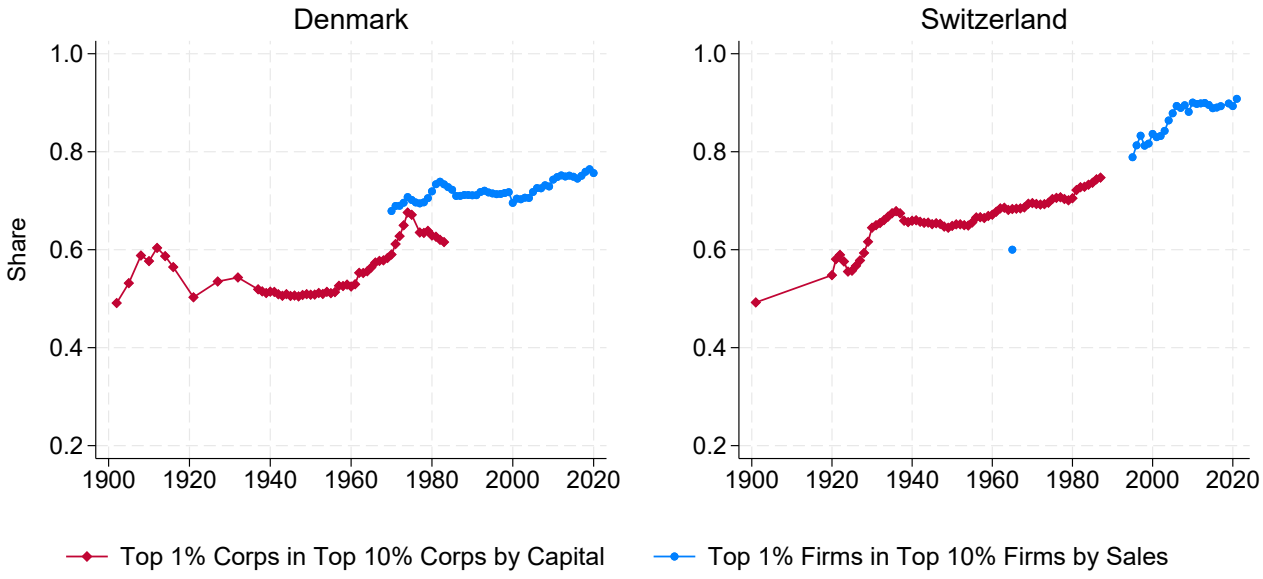


Figure IA6. Germany, Austria and France: Relative Top Shares

Notes: This figure shows the sales shares of the top 1% among the top 10% (Panel A) and the top 0.1% among the top 1% (Panel B) companies by sales, for Germany (left panel), Austria (middle panel) and France (right panel). See Internet Appendix IA2.2, IA2.5 and IA2.6 for details about variable construction.

Panel A. Top 1% in Top 10%



Panel B. Top 0.1% in Top 1%

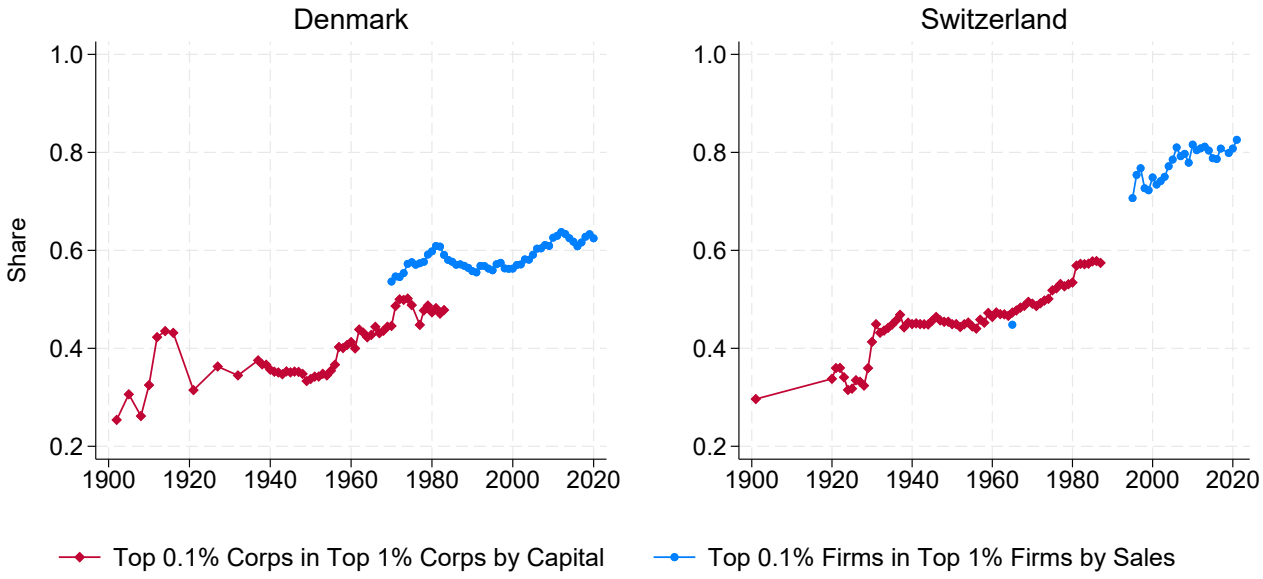
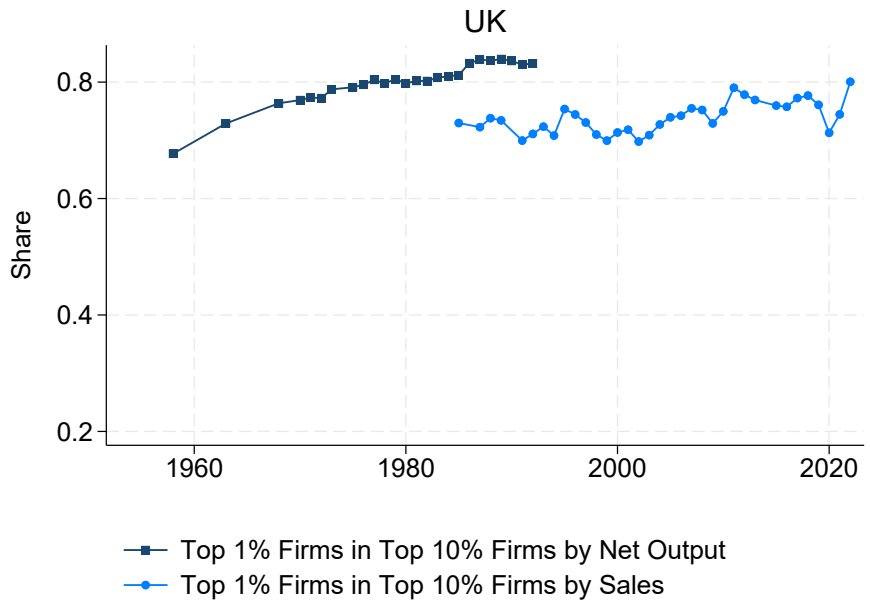


Figure IA7. Denmark and Switzerland: Relative Top Shares

Notes: The red line with diamonds shows the capital shares of the top 1% among the top 10% (Panel A) and the top 0.1% among the top 1% (Panel B) corporations by capital, for Denmark (left panel) and Switzerland (right panel). The blue line with circles shows the sales share of the top 1% among the top 10% (Panel A) and the top 0.1% among the top 1% (Panel B) companies by sales, for Denmark (left panel) and Switzerland (right panel). See Internet Appendix IA2.4 and IA2.8 for details about variable construction.

Panel A. Top 1% Firms in Top 10% Firms



Panel B. Top 0.1% Firms in Top 1% Firms

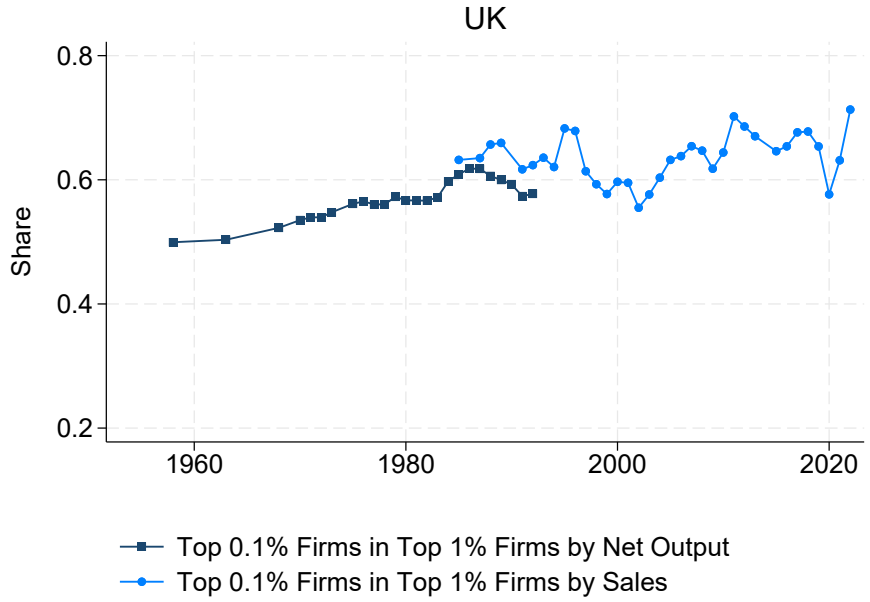


Figure IA8. U.K. (Manufacturing): Relative Top Shares

Notes: The dark blue line with diamonds shows the net output shares of the top 1% among the top 10% (Panel A) and the top 0.1% among the top 1% (Panel B) U.K.manufacturers by net output. The light blue line with circles shows the sales share of the top 1% among the top 10% (Panel A) and the top 0.1% among the top 1% (Panel B) U.K. manufacturers by sales. See Internet Appendix IA2.9 for details about variable construction.

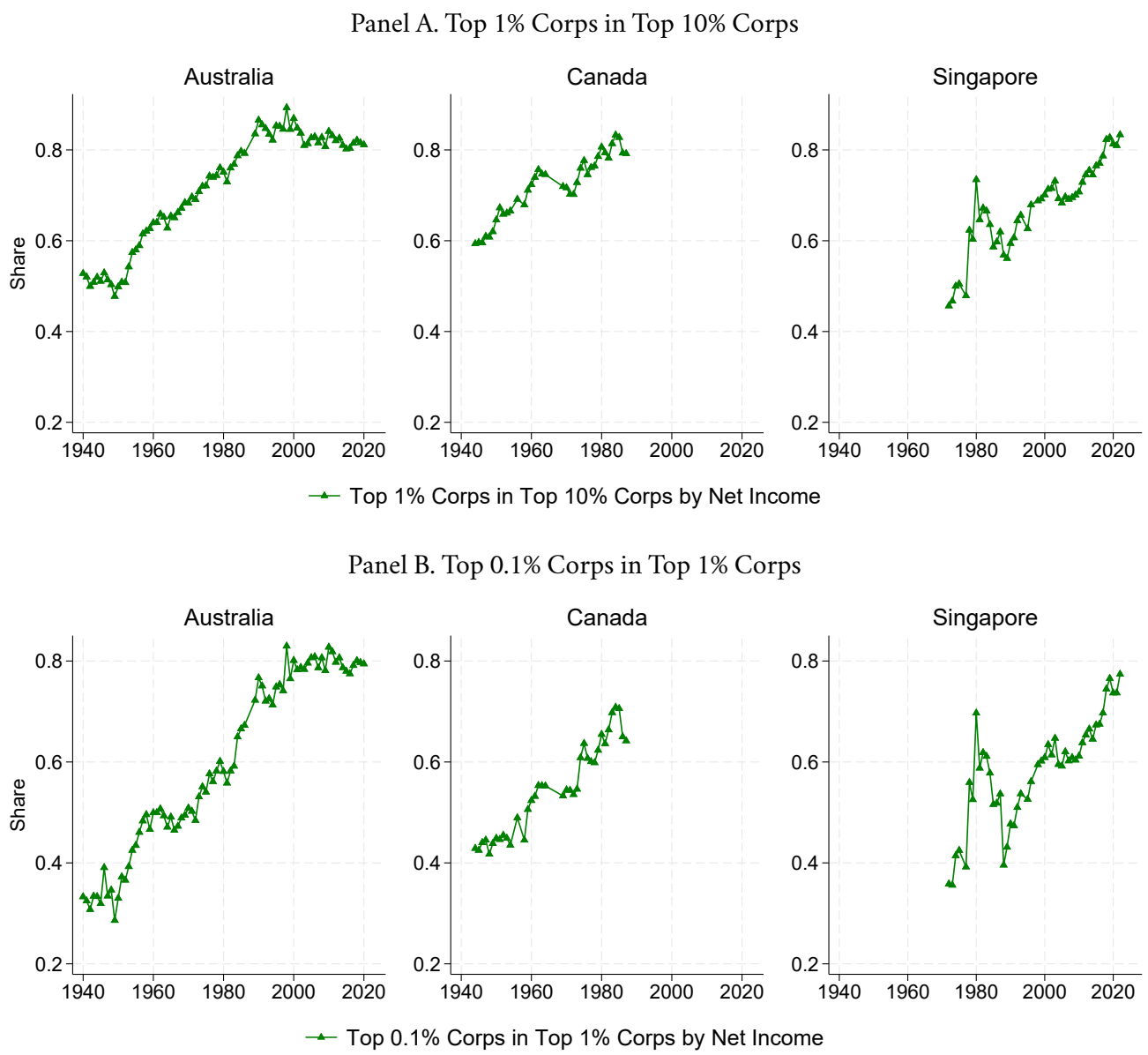


Figure IA9. Australia, Canada, and Singapore: Relative Top Shares

Notes: The green line with triangles shows the net income shares of the top 1% among the top 10% (Panel A) and the top 0.1% among the top 1% (Panel B) corporations by net income, for Australia (left panel), Canada (middle panel), and Singapore (right panel). See Internet Appendix IA2.1, IA2.3, and IA2.7 for details about variable construction.

IA2 Data Description by Country

IA2.1 Australia

Table IA1 lists the sources that we use for Australia.

IA2.1.1 By Net Income

Sources We are able to find tabulations by size of taxable income starting in 1940. We obtain PDFs from the National Library of Australia until income year 1993-1994 (Australian Taxation Office, 1944-1961, 1962-1995) and transcribe the data, and download data in Excel spreadsheets from `data.gov.au` afterwards (Australian Taxation Office, 2012-2023*a*).

Table IA1 – Australia: Data Sources

Type	Period	Source
Tabulations by net income	1940–1957	Australian Taxation Office (various years) *Report of the Commissioner of Taxation*.
	1958–2020	Australian Taxation Office (various years) *Taxation Statistics*. Digital files from 2004 onwards.
CR20 by sales (manufacturing)	1968–1987	Australia Bureau of Statistics (1987) *Manufacturing Industry Concentration Statistics*.
	1990–1993	Australia Bureau of Statistics (various years) *Manufacturing Industry*.
	1990–1993	Australia Bureau of Statistics (various years) *Manufacturing Industry*.
	2000	Australia Bureau of Statistics (various years) *Industry Concentration Statistics*.
Tabulations by employment	1968–1986	Australia Bureau of Statistics (various years) *Enterprise Statistics*.
	2004–2005	Australia Bureau of Statistics (various years) *Australian Industry*.

Notes: This table lists the sources of the Australian data.

Scope and variable definition By and large the data have all corporations with positive taxable income. We currently include both taxable and non-taxable corporations with positive taxable income for completeness, but the number of non-taxable corporations with positive taxable income is negligible.

Taxable income is defined as the amount remaining after deducting from assessable income all de-

ductions allowed under the Act. Such deductions include all normal business expenses, certain special deductions for expenditure of a capital nature and certain non-business deductions (Australian Taxation Office, 1962-1995).

Corporate share Since the size tabulations for Australia are restricted to corporations, we need to estimate the share of corporations relative to all businesses (especially relevant for the top N shares in Section III.A). We use the estimated corporate share in gross value added of private businesses.

Specifically, we have data on gross operating surplus of corporations and gross mixed income of noncorporations since 1960 from the Australian Bureau of Statistics (Australian Bureau of Statistics, 2023) and before then from (Butlin, 1985). To estimate gross value added of corporations and noncorporations, we also need information about the compensation of employees of corporations and noncorporations. The Australian national accounts provide total compensation of employees (including wages and employers' social contributions) for the public and private sector since 1983. The national accounts do not have a breakdown for compensation of employees by corporations versus noncorporations. For most years since 1981, we can obtain salaries and wage expenses by corporations and noncorporations from Taxation Statistics (Australian Taxation Office, 1992, 2023*b*).

To cover the sample period of our Australian firm size distribution data since 1940, we estimate the corporate share over this period by assuming that the ratio of compensation of employees to value added among corporations is the same as that in the overall private businesses. In this case, the corporate value added share would be the same as gross operating surplus of corporations relative to gross operating surplus of corporations plus gross mixed income of noncorporations. This estimate is shown by the solid dark blue line in Figure IA10. For 1983 onward, we can directly compute corporations' share in value added: we take compensation of employees among the private sector from the national accounts, and allocate to corporations and noncorporations using their shares in salary and wage expenses according to Taxation Statistics data; then we obtain the corporation value added share as corporate compensation of employees plus corproate gross operating surplus, divided by private business compensation of employees plus corproate gross operating surplus plus noncorporate mixed income. This series is shown by the dashed light blue line in Figure IA10. This cross check suggests that our baseline estimate is sensible.

Data construction

- Top x% net income share = Net income of top x% corporations by net income in a given year/Net income of corporations in a given year. Restricted to those with positive net income.
- Top x% net income share among top y% = Net income of top x% corporations by net income in a given year/Net income of top y% corporations in a given year. Restricted to those with positive net income.
- Top N net income share = Net income of top N corporations by net income in a given year/Estimated net income of corporations and noncorporations in a given year (starting with net income of

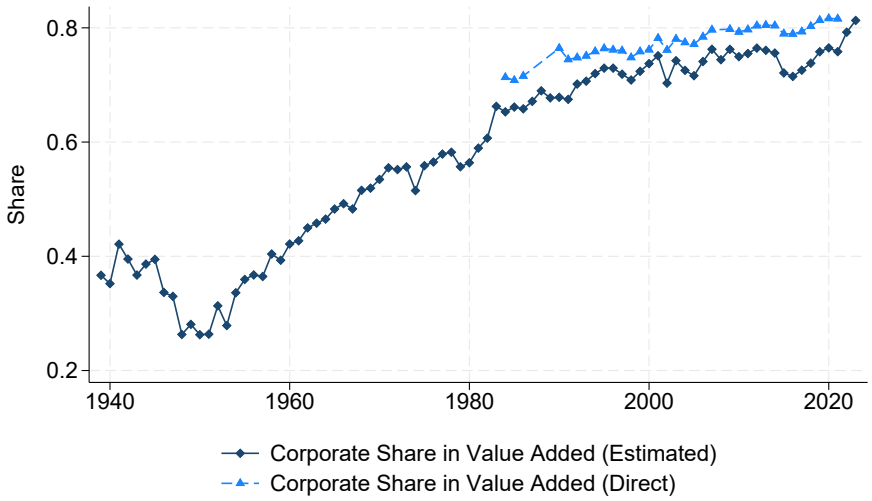


Figure IA10. Australia: Corporate Share Estimates

Notes: The figure shows the estimated corporate share in private business value added for Australia. The solid line uses the ratio of corporate gross operating surplus to corporate gross operating surplus plus noncorporate mixed income. The data come from the Australian Bureau of Statistics Australian Bureau of Statistics (2023) after 1960 and Butlin (1985) before then. This estimate assumes that the ratio of compensation of employees to value added among corporations is the same as that among private businesses overall. The dashed line uses the ratio of corporate gross operating surplus plus corporate compensation of employees to corporate gross operating surplus plus noncorporate mixed income plus private business compensation of employees. Corporate compensation of employees is obtain by multiplying private business compensation of employees with the ratio of corporate to corporate and noncorporate salary and wage expenses in Taxation Statistics.

corporations and divide by estimated corporate share as discussed above). Restricted to those with positive net income.

IA2.1.2 CR20 by Sales

Sources We are able to find CR20 for two-digit manufacturing industries from 1968 to 2001, from publications by the Australian Bureau of Statistics. The data for 1968 to 1993 come from various concentration statistics publications based on manufacturing censuses (Australian Bureau of Statistics, 1990, 1994, 1996*a*,*b*). The data for 2000 come from the industry concentration statistics report based on the annual Economic Activity Survey Australian Bureau of Statistics (2002). This report is also published for 1998 and 1999, but CR20 data are missing in those two years for industry "29. Other Manufacturing." We have not been able to find publicly available data after 2000.

Scope and variable definition The data cover manufacturing enterprise groups in Australia. The unit of observation is an enterprise group, which include all the operations in Australia of a group of companies which are related in terms of the uniform Companies Acts. Enterprise groups in the concentration statistics are formed by combining establishments within the enterprise group with the same industry classification. For 1968 to 1987, single establishment enterprises with fewer than four persons employed are excluded.

IA2.1.3 By Employment

Sources The Australian data on firm size by employment come from two sources. The first source is *Enterprise Statistics* by the Australia Bureau of Statistics (ABS), which are first published for the 1968–1969 integrated economic census. It is published continuously every year from 1977–1978 to 1986–1987, and apparently discontinued after that. The second source is *Australian Industry* by the ABS, which contain the number of firms for small (0 to 19 employees), medium (20 to 199 employees), and large businesses (over 200 employees) and the employment of each group for 2004–2005 and 2005–2006. These employment size bins are significantly coarser than earlier data. Since the large business bin contains about 630 manufacturing firms, we estimate the share of the top 630 firms in the case of Australia, so the top shares are not too sensitive to interpolation methods when the bins are coarse in the 2000s.

Scope and variable definition For the first source, the data come from integrated economic censuses. The unit of observation is an enterprise group. Single establishment enterprises with fewer than four persons employed are excluded. For the second source, the estimates presented are derived using a combination of directly collected data from the annual Economic Activity Survey (EAS), conducted by the Australian Bureau of Statistics (ABS), and business income tax (BIT) data provided by businesses to the Australian Taxation Office (ATO). It covers the population of private sector businesses. We use manufacturing businesses to be consistent with earlier census data.

Data construction

- Top 630 employment share = Employment of top 630 enterprises in a given year/Total employment of enterprises in a given year.

IA2.2 Austria

Table IA2 lists the sources that we use for Austria.

Sources We are able to find tabulations of companies by the size of sales from tax-related statistical publications from the Austrian statistical office. We obtain physical copies from the German National Library before 2012 (Österreichischen Statistischen Zentralamt, 1958; Österreichisches Statistisches Zentralamt, 1960-1980; Österreichischen Statistischen Zentralamt, 1977-1999; Statistik Österreich, 2000; Statistik Austria, 2001-2014), and PDFs from the website of Statistik Austria after 2012 (Statistik Austria, 2015-2023*a*). We then transcribe the data.

The sales tax was introduced in Austria in 1923 and converted to a value added tax in 1972. In 1954, the Austrian statistical office (Österreichische Statistische Zentralamt, today Statistik Austria) published for the first time tabulations by total sales (Gesamtumsatz). The statistical office also publishes tabulations by size from the business tax (Gewerbesteuer) and corporate tax (Körperschaftssteuer). We focus on the sales tax system because it includes all types of businesses, while the other taxes exclude sole proprietorships.

Table IA2 – Austria: Data Sources

Type	Period	Source
Tabulations by sales	1954–1957	Österreichisches Statistisches Zentralamt (various years) *Steuerstatistiken*.
	1960–1980	Österreichisches Statistisches Zentralamt (various years) *Statistisches Handbuch für die Republik Österreich*. Used to fill in gaps.
	1973–2020	Österreichisches Statistisches Zentralamt (various years) *Umsatzsteuerstatistik*. Renamed to Statistik Österreich (various years) *Statistik der Umsatzsteuer* in 1998.

Notes: This table lists the sources of the Austrian data.

Sales tax statistics in Austria have two different underlying sources. "Voranmeldungen": pre-registrations that companies have to file at regular intervals during the year, and "Veranlagungen": final tax assessments from companies tax returns submitted at the end of the fiscal year. We use data based on "Veranlagungen." Pre-registration statistics are typically published faster than assessment statistics, but exclude firms that do not have to pre-register (because they are exempted by the tax code from filing pre-registrations; these are typically new or small companies). Since tax statistics based on tax returns are available throughout, we do not have to rely on pre-registrations.

Scope and variable definition Firms have to pay sales tax and submit sales tax returns if their sales exceed a pre-specified threshold. It is roughly 1,500 Schillings in 1954 (Österreichischen Statistischen Zentralamt, 1958), 40,000 Schillings in 1973 (Österreichischen Statistischen Zentralamt, 1977), 30,000 Euros in 2018 (Statistik Austria, 2021), and 35,000 Euros in 2020 (Statistik Austria, 2023*b*). The unit of observation in the tabulations is a VAT-taxpayer - an individual or business engaged in a commercial or professional activity. A commercial or professional activity is any sustained activity aimed at generating income, even without the intention of making a profit. If an individual operates multiple businesses, the total revenue from all businesses is combined.

The statistics tabulate firms based on total sales (steuerbarer Umsatz) in Austria. This includes the provision of all goods and services that a business carries out in Austria (including exports). The 1973 statistics suggest that the tabulations include taxes until 1972, but exclude taxes from 1973 onwards.

Figure IA11 shows the coverage of the dataset. The left panel shows log total sales from the tabulations. The right panel shows the ratio of tabulated sales relative to GDP. The ratio fluctuates around two, which indicates that there is no systematic coverage increase or decrease of the tax statistics over time.

Data construction

- Top x% sales share = Sales of top x% companies by sales in a given year/All sales in a given year.
- Top x% sales share among top y% = Sales of top x% companies by sales in a given year/Sales of top

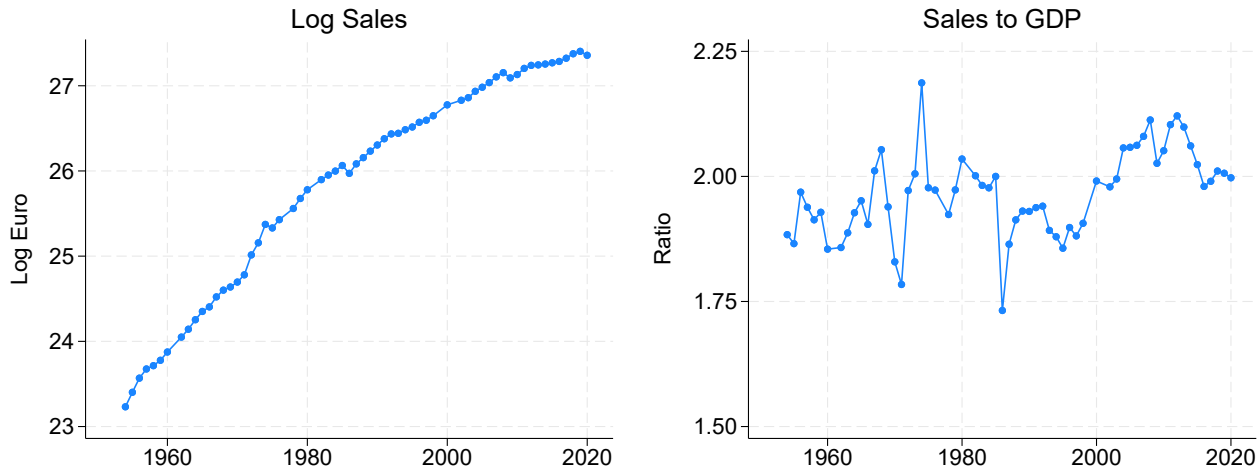


Figure IA11. Austria: Coverage of Sales in Tax Statistics

Notes: The left panel shows the log of all tabulated sales in our data. The right panel shows the ratio of tabulated sales to GDP. GDP data come from Statistisches Bundesamt (1960-1972) and OECD (2014).

Table IA3 – Canada: Data Sources

Type	Period	Source
Tabulations by net income	1944–1964	Revenue Canada (various years) *Taxation Statistics*.
	1969–1987	Revenue Canada (various years) *Corporation Taxation Statistics*.

Notes: This table lists the sources of the Canadian data.

y% companies by sales in a given year.

- Top N sales share = Sales of top N companies by sales in a given year/All sales in a given year.

IA2.3 Canada

Table IA3 lists the sources that we use for Canada.

Sources We obtain data on corporations by size of current year profit between 1944 (published in 1946) and 1964 (published in 1966) from Taxation Statistics and by size of taxable income between 1969 and 1987 from Corporation Taxation Statistics. We obtain physical books from the University of Chicago library (Department of National Revenue, 1944-1964; Statistics Canada, 1969-1987*a*), and transcribe the data.

Scope and variable definition The data come from corporation income tax returns. During the "Taxation Statistics" years, the tabulations cover all fully tabulated corporations, which exclude banks

and insurance companies, co-operatives, personal corporations, and companies with incomplete returns. During the "Corporation Taxation Statistics" years, the tabulations exclude credit unions, insurance carriers, non profit organizations, trusted pension funds, and municipally owned corporations. For these years, we use the tabulations for total nonfinancial industries given the exclusion of banks in the earlier years. A non-resident corporation has to file a return if, at any time in the year, one of the following situations applies:[15] 1) it carried on business in Canada; 2) it had a taxable capital gain; 3) it disposed of taxable Canadian property, unless the disposition meets all the exemption criteria.

In some years, corporations below a certain threshold are excluded.

- From 1944 to 1947, corporations with gross revenue less than $1,000 are considered inactive companies and are excluded (with the exception of mining or oil development companies that spend over $1,000 on their property, and investment trusts with a balance sheet that shows cash or marketable securities having a value in excess of $25,000).
- From 1948 to 1964, corporations with gross revenue less than $2,000 are excluded (with the exception of mining or oil development companies that spend over $2,000 on their property, and investment trusts with a balance sheet that shows cash or marketable securities having a value in excess of $25,000).
- From 1969 to 1980, the publications do not explicitly mention size exclusion.
- From 1981 to 1984, corporations for which assets, equity, sales, profits before taxes, and taxable income are less than $25,000 are not in sampled, but estimates for them are included in the tabulations.
- From 1985 to 1987, corporations with assets less than $50,000 and sales less than $10,000 are considered inactive and excluded from both sampling and estimation.

Between 1944 and 1964, the tabulations use the current year taxable profit. Between 1969 and 1987, the tabulations use taxable income, which is the current year profit less the prior year loss. According to analyses in Corporation Taxation Statistics, taxable income as a share of profit tends to be smaller for larger firms by size of profit (Statistics Canada, 1987*b*). Tax avoidance by large firms, which seems to increase over time, could lead to underestimation of top shares by taxable income, especially in the later years.

Corporate share Since the size tabulations for Canada are restricted to corporations, we need to estimate the share of corporations relative to all businesses (especially relevant for the top N shares in Section III.A). We use the estimated corporate share in net value added of private businesses.

Specifically, we have data on corporate profits and net income of unincorporated businesses (farm and non-farm), for the entire sample period from Statistics Canada (Statistics Canada, 1960-2011*a*) and

[15] See more information here: https://www.canada.ca/en/revenue-agency/services/forms-publications/publications/t4012/t2-corporation-income-tax-guide-before-you-start.html.

Historical Statistics of Canada (Historical Statistics of Canada, 1926-1976). The Canadian national accounts data on the net income of unincorporated businesses includes imputed rent from owner-occupied housing, which we remove using additional data.[16] Like in the case of Australia, we do not have direct information about the compensation of employees by corporations versus noncorporations, except for wages, salaries and employee benefits for the corporate sector since 1999 reported in the Financial and Taxation Statistics for Enterprises (Statistics Canada, 2002, 2006, 2011*b*, 2016). This dataset covers all incorporated enterprises within the domestic economy of Canada, but exclude enterprises classified to Management of Companies and Enterprises (NAICS 55); Religious Organizations (NAICS 8131); Political Organizations (NAICS 81394); Public Administration (NAICS 91); as well as Funds and other Financial Vehicles (NAICS 526).[17]

To cover the sample period of our Canadian firm size distribution data, we estimate the corporate share over this period by assuming that the ratio of compensation of employees to value added among corporations is the same as that in the overall private businesses (similar to the Australian case). In this case, the corporate value added share would be the same as the ratio of corporate profits to corporate profits plus net income of unincorporated businesses (excluding imputed rents from owner-occupied housing). This estimate is shown by the solid dark blue line in Figure IA12. For 1999 onward, we can directly compute corporations' share in value added as corporate wages, salaries and employee benefits (from Financial and Taxation Statistics for Enterprises) plus corporate profits, divided by wages, salaries and supplementary labour income from businesses and persons (from national accounts) plus corporate profits plus net income of unincorporated businesses (excluding imputed rents from owner-occupied housing). This series is shown by the dashed light blue line in Figure IA12. The two lines are similar; the exclusion of NAICS 55 in corporate wages, salaries and employee benefits data could lead to slight underestimate in the light blue line. Overall, this cross check suggests that our baseline estimate is sensible.

Data construction

- Top x% net income share = Net income of top x% corporations by net income in a given year/Net income of corporations in a given year. Restricted to those with positive net income.
- Top x% net income share among top y% = Net income of top x% corporations by net income in a given year/Net income of top y% corporations by net income in a given year. Restricted to those with positive net income.
- Top N net income share = Net income of top N corporations by net income in a given year/Estimated

[16] We use data on the net value added of owner-occupied housing from Piketty and Zucman (2014) available since 1960, and estimate it in earlier years using a closely related item "gross imputed rent" available from the Canadian national accounts since 1960 (Statistics Canada, 1976). Net value added of owner-occupied housing from Piketty and Zucman (2014) has a stable relationship with gross imputed rent for years with overlap, so we project the former onto the latter and then predict the former between 1947 and 1960.

[17] The Canadian national accounts have breakdown of "Wages, salaries and supplementary labour income" into from business, from persons, and from government. The business sector includes corporations as well as unincorporated business enterprises (the persons sector includes individuals as well as universities and other non-profit organizations) (Statistics Canada, 1975). Therefore, we cannot use this breakdown to directly obtain wages of the corporate sector.

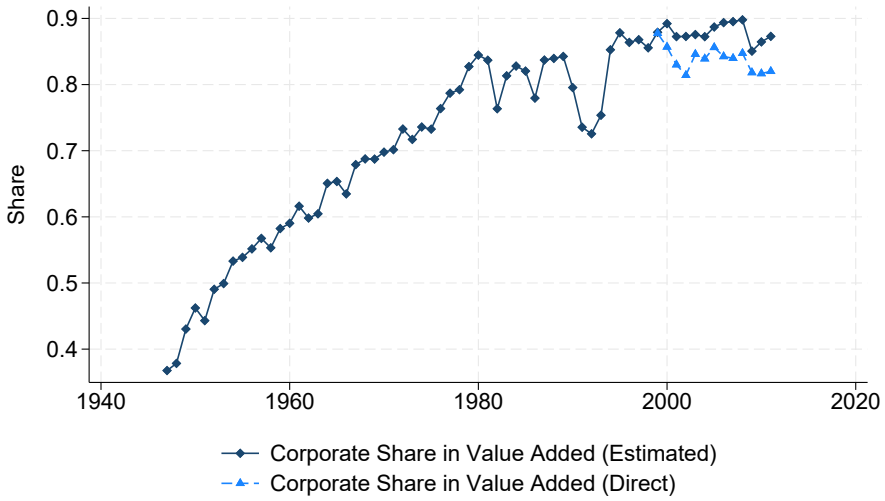


Figure IA12. Canada: Corporate Share Estimates

Notes: The figure shows the estimated corporate share in private business value added for Canada. The solid line uses the ratio of corporate profits to corporate profits plus net income of unincorporated businesses (excluding imputed rents from owner-occupied housing). This estimate assumes that the ratio of compensation of employees to value added among corporations is the same as that among private businesses overall. The dashed line uses the ratio of corporate wages, salaries and employee benefits plus corporate profits, divided by wages, salaries and supplementary labour income from businesses and persons (from national accounts) plus corporate profits plus net income of unincorporated businesses (excluding imputed rents from owner-occupied housing)

net income of corporations and noncorporations in a given year (starting with net income of corporations and divide by estimated corporate share as discussed above). Restricted to those with positive net income.

IA2.4 Denmark

Table IA4 lists the sources that we use for Denmark.

Sources First, between 1902 and 1983, Statistics Denmark published tabulations of corporations by size of equity capital based on corporate register data. We obtain PDFs of these publications through Statistics Denmark (Danmarks Statistik, 1903-1975, 1928-1932, 1984-1987) and transcribe the data. Second, between 1970 and 1999, Statistics Denmark published tabulations by sales based on the business registry and value added tax returns (the value added tax was introduced in Denmark in 1967). We obtain PDFs through Statistics Denmark (Danmarks Statistik, 1973-1981, 1983-2001*b*) and transcribe the data. These tabulations are discontinued in 2000. For 2000 to 2020, we directly obtain customized tabulations by sales from Statistics Denmark. These tabulations are compiled based on the Danish business register, and Danmarks Statistik (2020) explains the sample.

Table IA4 – Denmark: Data Sources

Type	Period	Source
Tabulations by capital	1902–1975	Danmarks Statistik (various years) *Statistisk Aarbog*.
	1921–1932	Danmarks Statistik (various years) *Statistiske Meddelelser - Aktieselskaber*.
	1977–1983	Danmarks Statistik (various years) *Statistiske Efterretninger - Bestanden af aktie og anpartsselskaber*.
Tabulations by sales	1970–1999	Danmarks Statistik (various years) *Statistiske Efterretninger - Momsregistrerede virksomheder*.
	2000–2020	Danmarks Statistik; directly obtained from the Business Statistics group at Danmarks Statistik.

Notes: This table lists the sources of the Danish data.

Scope and variable definition The tabulations by capital are restricted to corporations. The unit of observation is the joint-stock company as recorded in the Joint-Stock Company Register. The register records each legal entity separately. In 1977, a minimum capital size requirement of 100,000 Kronors was introduced (Danmarks Statistik, 1984-1987). The tabulations by sales cover all types of businesses with sales above a minimum threshold, and the data come from the General Enterprise Statistics. The unit of observation is the enterprise, defined as the smallest combination of legal units forming an organizational and financially autonomous entity (while most enterprises correspond to a single legal unit, some consist of multiple legal units, and a few in the agricultural sector are not linked to any legal unit). The minimum sales threshold is 5,000 Kronors in 1970 (Danmarks Statistik, 1973) and 20,000 Kronors in 1999 (Danmarks Statistik, 2001*c*). The tabulations by sales are restricted to active businesses after 2000 with the definition of active businesses (industry specific sales cutoffs) changing over time.

The Danish tabulations by capital use the value of paid-in capital until 1964, and subscribed capital since 1965 (Danmarks Statistik, 1965). Both concepts are comparable in magnitude (paid in capital in 1964: 7,972 million Kronors; subscribed capital in 1965: 8,622 million Kronors). The Danish tabulations by sales capture total domestic sales and exports, but exclude other foreign activities of Danish companies (Danmarks Statistik, 2001*a*).

Figure IA13 shows the coverage of the sales tabulations. The left panel shows log total sales from the tabulations. The right panel shows the ratio of tabulated sales relative to GDP, which is stable at slightly less than two.

Corporate share Since the tabulations by capital are restricted to corporations, we need to estimate of the share of corporations relative to all businesses (especially relevant for the top N shares in Section III.A). In recent years, we estimate the corporate share using the sales share of corporations in total sales, available from Statistics Denmark and Census publications (Danmarks Statistik, 1984-1987). In earlier

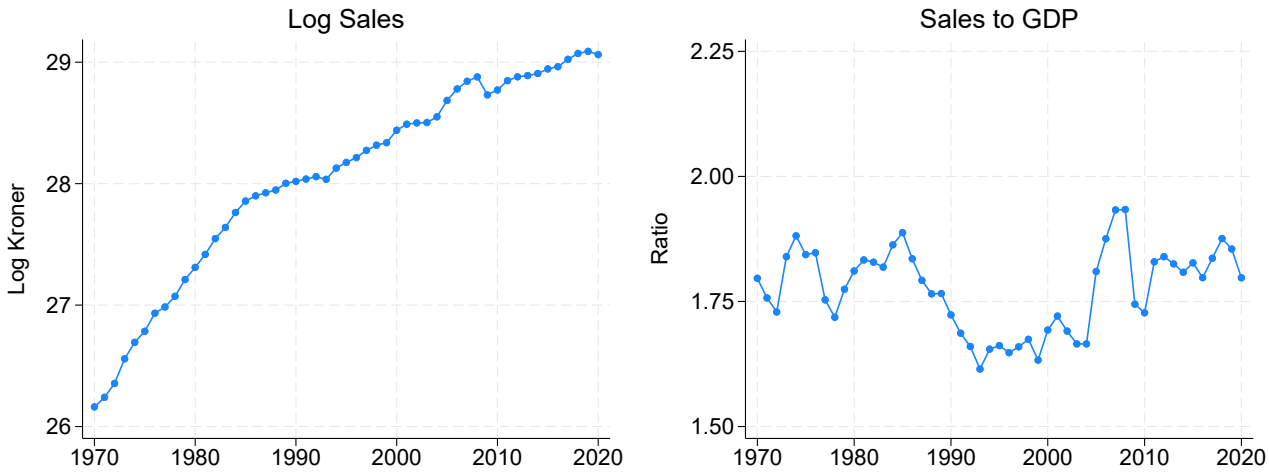


Figure IA13. Denmark: Coverage of Sales in Tax Statistics

Notes: The left panel shows the log of all tabulated sales in our data. The right panel shows the ratio of tabulated sales to GDP. GDP data come from Jordà, Schularick, and Taylor (2016).

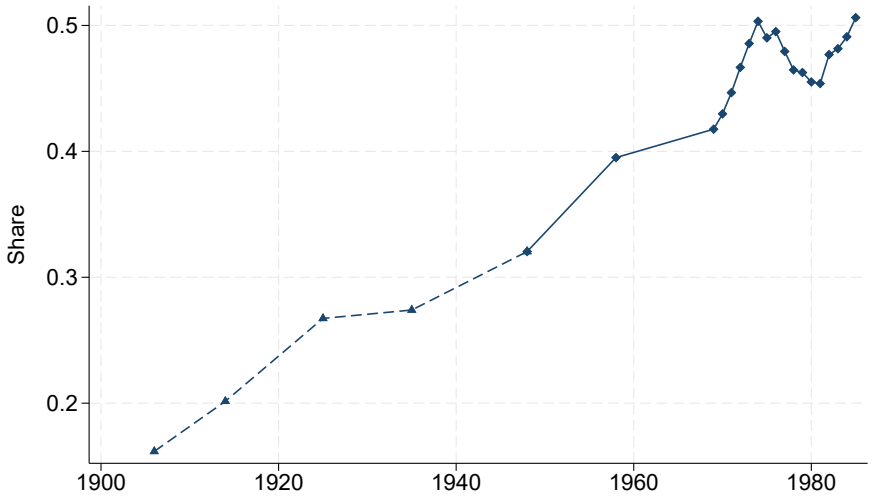


Figure IA14. Denmark: Corporate Share Estimates

Notes: The figure shows the estimated corporate share for Denmark. We use the sales share of corporations in total sales after 1948 (solid line with diamonds), and the employment share of industrial corporations among all industrial businesses before then (dashed line with triangles).

years, we can obtain estimates of the corporate employment share for industrials (Danmarks Statistik, 1908-1914, 1925-1948).[18] The two estimates are both available in 1948, and align closely. We therefore use the employment share series to extend our corporate share series further back in time.

Data construction

- Top x% capital share = Capital of top x% corporations by capital in a given year/Capital of corpora-

[18]The industrials sector includes construction, manufacturing, utilities, and mining.

Table IA5 – France: Data Sources

Type	Period	Source
Tabulations by sales	1949–1950	Ministère des Finances et des Affaires Économiques (1949, 1950) *Bulletin Mensuel de Statistique*.
	1952–1998	Ministère des Finances et des Affaires Économiques (various years) *Annuaire Statistique de la France*.
	1952–1983	Ministère de l'Economie et des Finances (various years) *Statistiques & Études Financières*. Used to fill in gaps.
Tabulations by employment	1966, 1981–1998	Institut National de la Statistique et des Études Économiques (various years) *Annuaire Statistique de la France*.
	1973	Brocard and Gandois (1978) *Grandes Entreprises et PME*. Economie et Statistique 96.1, 25-41.
	1975	Brocard (1979) *Les Entreprises Françaises. Concentration et Grandes Entreprises des Secteurs et des Branches*. Collections de l'INSEE. Série E. Entreprises 64.

Notes: This table lists the sources of the France data.

tions in a given year.

- Top x% capital share among top y% = Capital of top x% corporations by capital in a given year/Capital of top y% corporations by capital in a given year
- Top N capital share = Capital of top N corporations by capital in a given year/Estimated capital of corporations and noncorporations in a given year (starting with capital of corporations and divide by estimated corporate share as discussed above).
- Top x% sales share = Sales of top x% companies by sales in a given year/All sales in a given year.
- Top x% sales share among top y% = Sales of top x% companies by sales in a given year/Sales of top y% companies by sales in a given year.
- Top N sales share = Sales of top N companies by sales in a given year/All sales in a given year.

IA2.5 France

Table IA5 lists the sources that we use for France.

IA2.5.1 By Sales

Sources The primary sources for the sales size distribution among French firms are "Annuaire Statistique de la France" published by the French statistical office (Insee) (Ministère des Finances et des Affaires Économiques, 1954-2000) and "Statistiques & Études Financières" published by the Ministry of Economy and Finance (Ministère de l'Economie et des Finances, 1954-1984). These two sources allow us to obtain tabulations of companies by the size of sales (chiffre d'affaires) from 1952 onwards. Currently we stop in 1998 because size tabulations up to this point include finance, but size tabulations after 1998 exclude finance. We are able to add data for 1949 and 1950 from Bulletin "Mensuel de Statistique" published by the French statistical office (Ministère des Finances et des Affaires Économiques, 1953). We obtain physical copies of "Statistiques & Études Financières" from the University of Chicago Library. We obtain PDFs of "Annuaire statistique de la France" and "Bulletin Mensuel de Statistique" from Gallica, which is the digital library of the French national library (Bibliothèque nationale de France). We then transcribe the data.

Scope and variable definition The data on firms size by sales come from tax statistics (sales tax before 1968 and VAT afterwards). The data cover all industrial and commercial firms (Bénéfices Industriels et Commerciaux). The data exclude BNC (Bénéfices Non Commerciaux) firms (e.g., self-employeed professionals like doctors and lawyers) and agriculture firms. Each unit is a siren (Système d'Identification du Répertoire des Entreprises). The size tabulations always cover large firms that belong to Bénéfices Réels Normal (BRN) tax regime, and cover smaller firms that belong to Régime Social des Indépendants (RSI) tax regime in some years.[19] They do not cover Forfait (FORF) firms, which are small in number and in volume. For consistency, in years when RSI firms are not included in the size tabulations, we assign all of them to the size bin that corresponds to their average size. We also assign all of FORF firms to the size bin that corresponds to their average size. This assumption should not affect top share estimates because RSI and FORF firms by definition have low sales, so they matter little for the numerator of top shares.

Sales are measured by chiffre d'affaires, defined as the total revenue generated by a company in French territories, including exports. Figure IA15 shows the coverage of the dataset. The left panel shows log total sales from the tabulations. The right panel shows the ratio of tabulated sales relative to GDP. The coverage was relatively low in the early years, possibly because the data do not include BNC firms.

Data construction

- Top x% sales share = Sales of top x% companies by sales in a given year/All sales in a given year.
- Top x% sales share among top y% = Sales of top x% companies by sales in a given year/Sales of top y% companies by sales in a given year.
- Top N sales share = Sales of top N companies by sales in a given year/All sales in a given year.

[19] Before 1976, BRN and RSI firms combined as one category Bénéfices Réels.

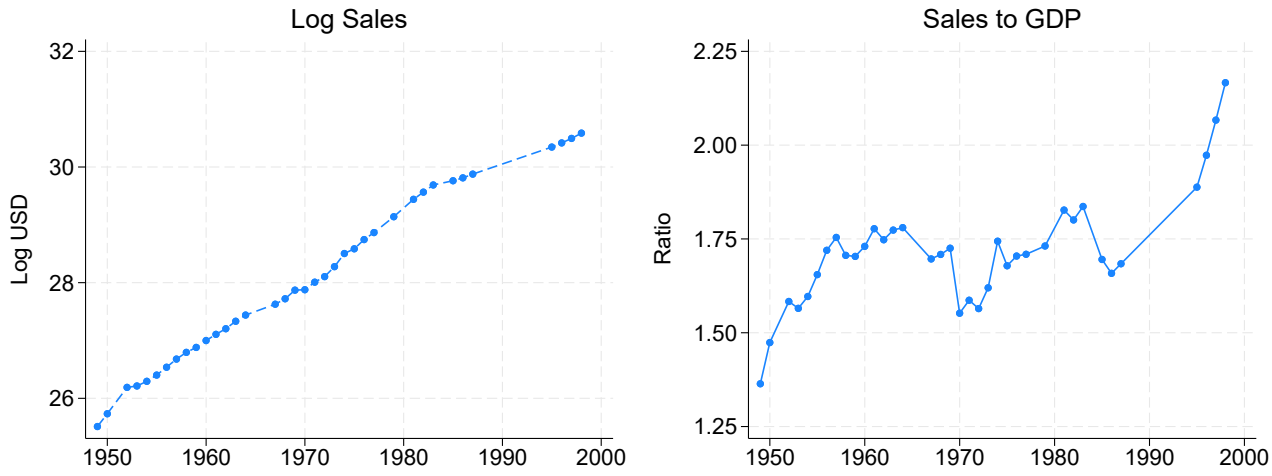


Figure IA15. France: Coverage of Sales in Tax Statistics

Notes: The left panel shows the log of all tabulated sales in our data. The data is expressed in USD equivalents to allow for a comparability between Old Franc, New Franc and Euro values. The right panel shows the ratio of tabulated sales to GDP. GDP and exchange rate data come from Jordà, Schularick, and Taylor (2016).

IA2.5.2 By Employment

Sources We obtain data on employment size distribution of French companies using Ministère des Finances et des Affaires Économiques (1954-2000) for 1966 and 1981 to 1998. The tabulation for 1966 comes from "Fichier des Entreprises et des Établissements," an early version of the French business registry. The tabulations for 1981 to 1998 are based on the same statistics as the sales size distribution. In addition, we can find tabulations for 1973 in Brocard and Gandois (1978) and for 1975 in Brocard (1979), which are based on businesses' fiscal declarations.

Scope and variable definition The tabulations cover all BIC (Bénéfices Industriels et Commerciaux) firms. Bénéfices Non Commerciaux (self-employed professionals) and Bénéfices Agricoles (agriculture) are not tabulated. The published size tabulations cover all BIC firms until 1981, but exclude small firms that submit their tax records using the BRN and Forfait tax regime in some later years (see the discussion above for more detail). For consistency, in years when RSI and Forfait firms are not included in the size tabulations, we assign all of them to the size bin that corresponds to their average size (typically the smallest bin).

Data construction

- Top x% employment share = Employment of top x% companies by employment in a given year/Total employment in a given year.
- Top N employment share = Employment of top N companies by employment in a given year/Total employment in a given year.

IA2.6 Germany

Table IA6 lists the sources that we use for Germany.

IA2.6.1 By Sales

Sources We are able to find tabulations of companies by the size of sales from tax-related statistical publications from the German statistical office. We obtain physical copies of the publications before 1935 through the German National Library (Statistisches Reichsamt, 1928, 1931, 1932, 1938), and PDFs through the statistical library of the Statistisches Bundesamt afterwards (Statistisches Bundesamt, 1955-1961, 1962-1976, 1978-2011, 2012-2022*a*). We then transcribe the data.

The first sales tax law in Germany was introduced in 1916 on the delivery of all goods. In 1918, the tax expanded to cover all goods and services. Subsequently, in 1967, additional reform led to the transition to a value added tax system. The German statistical office published regular reports based on submitted tax records including tabulations of businesses by size of sales since 1924.

Sales tax statistics in Germany have two different underlying sources. "Voranmeldungen": pre-registrations that companies have to file at regular intervals during the year, and "Veranlagungen": final tax assessments from companies tax returns submitted at the end of the fiscal year. The advantage of pre-registration statistics is that they can usually be published much faster than assessment statistics. The main difference is that pre-registrations are only filed by firms that exceeded the tax threshold in the previous year and thus exclude entrants and firms with sales below the exemption threshold in the previous year. Assessment statistics are available from 2006 onward and prior to 1950. For consistency, we use pre-registration statistics after 1950, and assessment statistics before 1950.

Scope and variable definition The unit of observation consists of a legal entity required to pay VAT taxes and submit a VAT pre-declaration. If multiple businesses are financially, economically, and organizationally integrated, they typically file a joint VAT return ("Organschaft"). Firms have to pay value added tax (sales tax before 1968) if their sales exceed a pre-specified threshold. The threshold is 8,000 Deutsche Marks in 1958 (Statistisches Bundesamt, 1955-1961), 20,000 Deutsche Marks in 1980, and 17,500 Euros by 2003 (Statistisches Bundesamt, 1978-2011). The tabulations in some years before 1958 have a minimum threshold while others do not. For the years where there is no minimum threshold, we impose one ourselves to maximize consistency over time. For the years between 1955 and 1958, we set this threshold to 8,000 Deutsche Mark to be consistent with later years. For 1950, we set the threshold to 6,000 Deutsche Mark (since 8,000 is not a size bin threshold in that year). For the years until 1935 that use a different currency, we set this threshold to 5,000 Reichsmark. Before 1945, the tax statistics encompass firms from the entire "German Reich." After 1945, the statistics cover West Germany. West Berlin is included from 1957 onward, the Saarland from 1960 onward, and East Germany from 1992 onward.

The tax statistics tabulate firms based on total sales (Gesamtumsatz / steuerbarer Umsatz) in Germany.

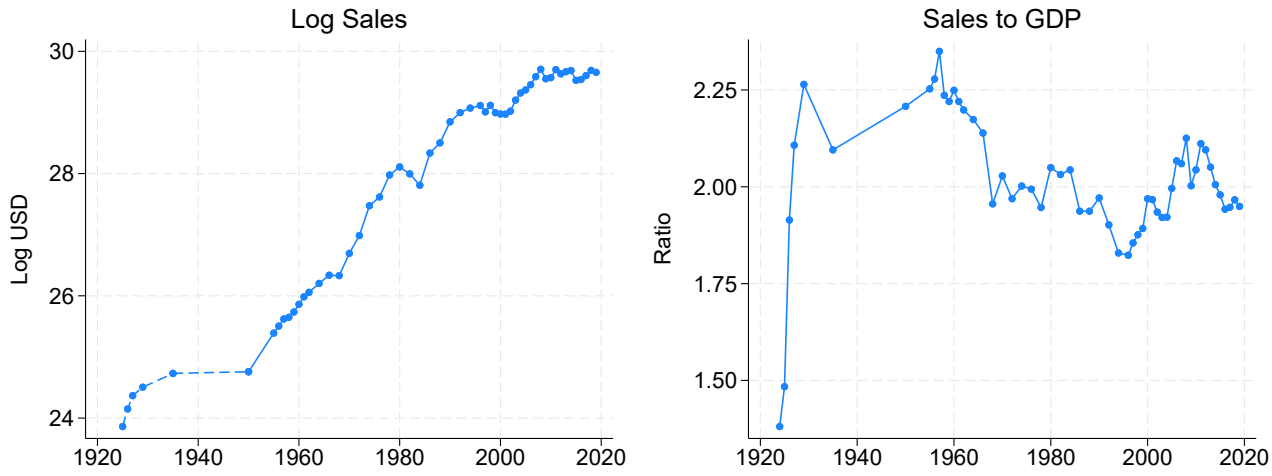


Figure IA16. Germany: Coverage of Sales in Tax Statistics

Notes: The left panel shows the log of all tabulated sales in our data. The data is expressed in USD equivalents to allow for a comparability between Reichsmark and Deutsche Mark values. The right panel shows the ratio of tabulated sales to GDP. Data for East Germany are included from 1992 onward. GDP and exchange rate data come from Jordà, Schularick, and Taylor (2016).

This includes taxable sales and tax-exempt sales (steuerfreie Umsätze), such as exports. Sales conducted outside of Germany or without payment for goods or services are not accounted for in the statistics (nichtsteuerbare Umsätze). In addition, internal transactions within a tax group are non-taxable and not included. Imports are subject to sales tax (Einfuhrumsatzsteuer), but not covered by the statistics.

Figure IA16 shows the coverage of tabulated sales from the tax statistics. The left panel shows log sales over time. Log sales increase over time without obvious discontinuities. The integration of East Germany did not create a sizable discontinuity, as the East German economy was small relative to the West German economy. The level before and after World War II are not comparable due to the currency reform of 1948. The right panel shows the ratio of tabulated sales relative to GDP. The ratio fluctuates around two. Overall, these figures confirm that the tax statistics coverage of the economy did not change materially over time.

Sector harmonization The German tax statistics include tabulations by sector. We use these sectoral tabulations to estimate top shares in manufacturing, retail/wholesale trade, and services, which are roughly comparable with SIC codes 20-39 (manufacturing), 50-59 (trade), and 70-89 (services). The statistical office periodically updated its sector classifications, requiring some adjustment to create sectors that are as consistent as possible over the long run. The following two main caveats remain. First, the manufacturing series also includes mining before 1935 as it has impossible to separate these two sectors precisely in the early data, and it has been impossible to combine them into one joint series throughout the sample period. Second, the sector definitions of the services subsectors (which we combine to obtain one series for services as a whole) changed over time with particularly significant adjustments in 1968 and 2009. The level differences in our concentration estimates around these breakpoints should therefore be interpreted with caution.

Data construction

- Top $x\%$ sales share = Sales of top $x\%$ companies by sales in a given year/All sales in a given year.
- Top $x\%$ sales share among top $y\%$ = Sales of top $x\%$ companies by sales in a given year/Sales of top $y\%$ companies by sales in a given year.
- Top N sales share = Sales of top N companies by sales in a given year/All sales in a given year.

IA2.6.2 CR10 by Sales

Sources Data from 1954 to 1982 come from Statistisches Bundesamt (1985), which compiles early concentration statistics derived from the activity reports of the Federal Cartel Office and the reports of the Monopolies Commission. This publication provides a summarized account of these early statistical efforts in West Germany. Data from 1983 to 2016 come from Fachserie 4.2.3 (Statistisches Bundesamt, 1986-2018), which has published concentration statistics since 1977, when the German statistical office launched its regular program on concentration statistics for the mining and manufacturing industries. The publication of the Fachserie was discontinued in 2016, but updated files for 2017 to 2021 were provided to us via email by the German statistical office.[20]

Scope and variable definition The data include all manufacturing companies with 20 or more employees. The unit of observation is a firm, defined as the smallest legal entity required to maintain accounting records and prepare financial statements for commercial and/or tax purposes. This definition includes all administrative operations, as well as non-manufacturing divisions (e.g., trading departments). However, it excludes foreign branches and legally independent subsidiaries. Companies are classified entirely to the economic sector in which they are primarily active.

Sales are defined as the value of invoiced deliveries and services to third parties, excluding VAT. It includes revenue from own products and services but excludes non-operating income like asset sales, interest income, and dividends.

IA2.6.3 By Employment

Sources We use two types of tabulations by employment size for Germany. First, between 1925 and 1986, we obtain tabulations from census of establishments ("Arbeitsstättenzählung"), which was conducted at irregular intervals approximately every 10 to 15 years during this time period. We obtain physical copies of all pre-WWII census of establishment publications from the German National Library to verify the availability of firm size tabulations (Statistisches Bundesamt, 1930). PDF files for the 1950, 1961, 1970,

[20] In addition, the German statistical office provided us with an internal version of the Fachserie 4.2.3 (which includes the concentration statistics) for 2007 and 2008, which was based on the industry classification WZ2003. The published version available online uses the WZ2008 classification but does not include data for 2007.

and 1987 censuses are accessible online through the statistical library of the Statistisches Bundesamt (Statistisches Bundesamt, 1965, 1990). No firm-level employment size tabulations are available for the 1933, 1939, and 1950 censuses.[21] Second, for 2003 to 2022, the data come from the company register ("Unternehmensregister") managed by the German statistical office (Statistisches Bundesamt, 2025). The statistical office maintains and updates the register using information from tax authorities, the federal employment agency, surveys, and commercial data providers. The statistical office kindly provided us with detailed tabulations for all years, as only the most recent ones are available online. In addition, the customized tabulations are more granular and allow for more precise top share estimates.

Scope and variable definition The census of establishments covers all non-agricultural companies and their employees. The unit of observation is a company, defined as the smallest legal unit that maintains financial records for business or tax purposes. Companies (or "economic units" as they are called in early issues of the census) can either be single establishment firms or the aggregation of several establishments that belong to the same legally independent enterprise. The company tabulations include data from all domestic establishments (even if the establishments engage in agricultural activities).

Employees include all full-time and part-time workers who are in an employment relationship on the reference date and are listed on the payroll. This also includes active owners and unpaid assisting family members, regardless of the number of hours they work at the workplace.

The company register includes businesses from all sectors, except agriculture, public administration, and extraterritorial entities. The unit of observation in the company register is a legal unit. A legal entity is included in the register if its annual revenue exceeds a sales threshold (which is equal to the corresponding sales threshold in the VAT tax tabulations) or if it has at least one employee subject to social security contributions.

Employees include all workers after 2019. Before then, employees include all workers subject to social security contributions (i.e., those earning above a minimum threshold); self-employed and working owners are excluded unless registered as employees subject to social security contributions (e.g., a GmbH managing director with a salary). This narrower definition of employees tends to raise top employment shares by a small amount between 2003 and 2018. The data from 2003 to 2005 are based on the industry classification WZ 2003. Later years are classified based on WZ 2008, which may have resulted in small changes in the population of firms, even at the aggregate level according to the statistical office.

Data construction

- Top x% employment share = Employment of top x% companies by employment in a given year/Total employment in a given year.
- Top N employment share = Employment of top N companies by employment in a given year/Total

[21] The 1933 census publications omitted firm size tabulations; a planned 1939 census volume on firm-level statistics was never published; and the 1950 census publications only tabulate firm size based on sales rather than employment.

employment in a given year.

Table IA6 – Germany: Data Sources

Type	Period	Source
Tabulations by sales	1924	Statistisches Reichsamt (1928) *Statistik des Deutschen Reichs Band 353 - Die Deutsche Umsatzbesteuerung nach dem Kriege*.
	1925–1929	Statistisches Reichsamt (various years) *Statistik des Deutschen Reichs Band 361 and 399 - Umsatz und Umsatzsteuer in Deutschland*.
	1935	Statistisches Reichsamt (1938) *Statistik des Deutschen Reichs Band 511 - Umsatzsteuerstatistik 1935*.
	1950–1959	Statistisches Bundesamt (various years) *Die Umsätze der Umsatzsteuerpflichtigen und deren Besteuerung*.
	1960–1974	Statistisches Bundesamt (various years) *Finanzen und Steuern Fachserie L Reihe 7 - Umsatzsteuer*.
	1976–2009	Statistisches Bundesamt (various years) *Finanzen und Steuern Fachserie 14 Reihe 8 - Umsatzsteuer*.
	2010–2019	Statistisches Bundesamt (various years) *Finanzen und Steuern Fachserie 14 Reihe 8.1 - Umsatzsteuerstatistik (Voranmeldungen)*.
CR10 by sales (manufacturing)	1954–1982	Statistisches Bundesamt (1985) *Konzentrationsstatistische Daten für den Bergbau und das Verarbeitende Gewerbe, Fachserie 4 Reihe S.9*.
	1983–2021	Statistisches Bundesamt (various years) *Konzentrationsstatistische Daten für den Bergbau und das Verarbeitende Gewerbe sowie das Baugewerbe, Fachserie 4 Reihe 4.2.3*.
Tabulations by employment	1925	Statistisches Reichsamt (1930) *Statistik des Deutschen Reichs Band 413, IV - Gewerbliche Betriebszählung - Die gewerblichen Betriebe und Unternehmungen im Deutschen Reich, Teil IV.*
	1961	Statistisches Bundesamt (1965) *Unternehmen und Arbeitsstätten Fachserie C - Arbeitsstättenzählung von 6. Juni 1961, Heft 4 Nichtlandwirtschaftliche Unternehmen (Wirtschaftseinheiten) und Beschäftigte.*
	1970, 1987	Statistisches Bundesamt (1990) *Unternehmen und Arbeitsstätten Fachserie 2 - Arbeitsstättenzählung vom 25. Mai 1987, Heft 11 Arbeitsstätten, Unternehmen und Beschäftigte 1987, 1970, 1961, 1950.*
	2003–2023	Statistisches Bundesamt (2025) *Statistisches Unternehmensregister, Rechtliche Einheiten nach Sondergrößenklassen der Beschäftigten*. Provided by the German statistical office.

Notes: This table lists the sources of the German data.

Table IA7 – Singapore: Data Sources

Type	Period	Source
Tabulations by net income	1972–2004	Inland Revenue Department (various years) *Yearbook of Statistics, Singapore*.
	2005–2022	Inland Revenue Authority of Singapore (various years) *Taxable Companies by Assessed Income Group*.

Notes: This table lists the sources of the Singaporean data.

IA2.7 Singapore

Table IA7 lists the sources that we use for Singapore.

Sources We obtain tabulations of corporations by the size of net income (assessed income) since 1972. The data are prepared by the Inland Revenue Department before 1992, and by the Inland Revenue Authority of Singapore afterwards. We transcribe tabulations from the Yearbook of Statistics for 1972 to 2004 (Singapore Department of Statistics, 1972-2004), and obtain data directly from the Inland Revenue Authority of Singapore (IRAS) since 2005 (Inland Revenue Authority of Singapore, 2005-2007, 2008-2022).

Scope and variable definition The tabulations include resident and non-resident corporations. Initially, the data are tabulated by assessed income. From 2005 onward, tabulations are by chargeable income. There is no major discontinuity in the totals when the variable definition changes from assessed to chargeable income between 2004 and 2005.

Corporate share Firm size tabulations for Singapore are restricted to firms subject to the corporate tax. Therefore, we need to obtain an estimate of the share of corporations relative to all businesses (especially relevant for the top N shares in Section III.A). We can use data from national accounts from the Singapore Department of Statistics (Singapore Department of Statistics, 1985-2022) from 1985 onward, by taking the ratio of corporate sector GDP to corporate plus noncorporate GDP. We use data on assessed income by legal form from the Yearbook of Statistics between 1972 and 1985, by taking the ratio of corporate assessed income to corporate plus noncorporate (partnership and sole proprietorship) assessed income (Singapore Department of Statistics, 1972-2004); we take five-year moving average of this series to make it more stable. The resulting corporate share series is shown in Figure IA17.

Data construction

- Top x% net income share = Net income of top x% corporations by net income in a given year/Net income of corporations in a given year. Restricted to those with positive net income.
- Top x% net income share among top y% = Net income of top x% corporations by net income in a given year/Net income of top y% corporations by net income in a given year. Restricted to those

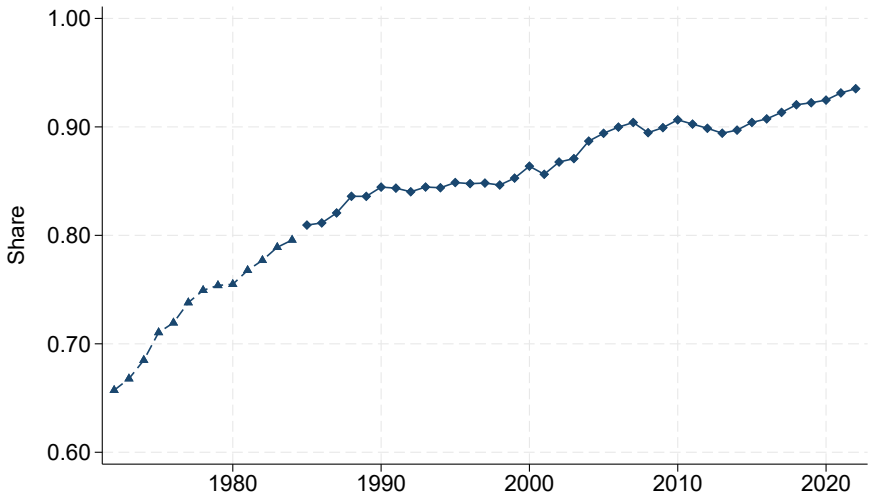


Figure IA17. Singapore: Corporate Share Estimates

Notes: The figure shows the estimated corporate share for Singapore. We use the ratio of corporate GDP to corporate GDP to corporate and noncorporate GDP since 1985 (solid line with diamonds), and the five-year moving average of corporate assessed income to corporate plus noncorporate (partnership and sole proprietorship) assessed income (dashed line with triangles) between 1972 and 1985.

with positive net income.

- Top N net income share = Net income of top N corporations by net income in a given year/Estimated net income of corporations and noncorporations in a given year (starting with net income of corporations and divide by estimated corporate share as discussed above). Restricted to those with positive net income.

IA2.8 Switzerland

Table IA8 lists the sources that we use for Switzerland.

IA2.8.1 By Sales and Capital Stock

Sources First, between 1901 and 1987, the Swiss Statistical Office (*Eidgenössisches Statistisches Amt*) published tabulations of corporations by size of equity capital, based on analyses of joint-stock companies recorded in the Business and Enterprise Register (*Betriebsund Unternehmungsregister*).[22] We obtain PDFs from the Statistical Yearbook and special issues on joint stock corporations published by the Federal Statistical Office (Eidgenössisches Statistisches Amt, 1934, 1922-1986; Bundesamt für Statistik, 1988); we then transcribe the data. Second, since 1995, the Swiss Tax Authority (Eidgenössische Steuerverwaltung) has an annual publication of value added tax statistics (*Die Mehrwertsteuer in der Schweiz*). We obtain PDFs

[22]The entries in the register are based on information published in the Swiss Commercial Gazette (*Handelsamtsblatt*).

Table IA8 – Switzerland: Data Sources

Type	Period	Source
Tabulations by capital	1901–1930	Eidgenössisches Statistisches Amt (1934) *Statistische Quellenwerke der Schweiz / Heft 56 - Schweizerische Aktiengesellschaften 1921 bis 1933.*
	1921–1985	Eidgenössisches Statistisches Amt (various years) *Statistisches Jahrbuch der Schweiz.*
	1986–1987	Bundesamt für Statistik (1988) *Aktiengesellschaften in der Schweiz 1987; Amtliche Statistik der Schweiz, Nr. 200.*
Tabulations by sales	1965	Eidgenössisches Statistisches Amt (1967) *Statistische Quellenwerke der Schweiz Heft 409, Reihe Df 1, Unternehmungen Hauptergebnisse für die Schweiz*.
	1995–2021	Eidgenössische Steuerverwaltung (various years) *Die Mehrwertsteuer in der Schweiz.*
Tabulations by employment	1929	Eidgenössisches Statistisches Amt (1933) *Statistische Quellenwerke der Schweiz Heft 29, Die Unternehmungen in der Schweiz, Band 5 der Eidgenössischen Betriebszählung 1929.*
	1939	Eidgenössisches Statistisches Amt (1946) *Statistische Quellenwerke der Schweiz Heft 171, Die Unternehmungen in der Schweiz*.
	1955	Eidgenössisches Statistisches Amt (1965) *Statistisches Jahrbuch der Schweiz 1965.*
	1965	Eidgenössisches Statistisches Amt (1967) *Statistische Quellenwerke der Schweiz Heft 409, Reihe Df 1, Unternehmungen Hauptergebnisse für die Schweiz*.
	1975	Eidgenössisches Statistisches Amt (1977) *Statistische Quellenwerke der Schweiz Heft 606, Eidgenössische Betriebszählung 1975 Unternehmungen, Hauptergebnisse für die Schweiz*.
	1985	Bundesamt für Statistik (1994) *Die wirtschaftliche Entwicklung im Spiegel der Betriebszählung 1985 and 1991.*
	1991-2008	Bundesamt für Statistik (2025) *Betriebszählung, 1991 bis 2008.* Provided by the STATENT Team at the Swiss Federal Statistical Office.
	2011-2022	Bundesamt für Statistik (2025) *Institutionelle Einheiten (Unternehmen) marktwirtschaftlich nach Grössenklasse und Wirtschaftssektor*. Provided by the STATENT Team at the Swiss Federal Statistical Office.

Notes: This table lists the sources of the Swiss data.

from the Swiss Statistical Office (Eidgenössische Steuerverwaltung, 1997-2023) and transcribe the data. In addition, the Swiss Statistical Office published a tabulation of firms by sales size based on the establishment census in 1965. See section IA2.8.2 for more detail about the source.

Scope and variable definition The tabulations by capital are restricted to corporations. The unit of observation is the set of all legal entities registered as corporations in the Business and Enterprise Register. Thus, the data is generally recorded on an unconsolidated basis, with each legal entity considered separately. In 1937 a 50,000 Swiss franc minimum capital requirement was introduced for newly formed corporations (Federal Government of Switzerland, 1936). Corporations with less capital continued to operate, but gradually disappeared in the 1940s (Eidgenössisches Statistisches Amt, 1947), and disappeared entirely by 1952 (Eidgenössisches Statistisches Amt, 1953).

The tabulations by sales from the VAT tax statistics cover all types of businesses with sales above a minimum threshold. Businesses with an annual turnover above the threshold must register in the VAT register and submit periodic declarations to the Federal Tax Administration (ESTV). The unit of observation consists of a legal entity or a group of entities registered as a single taxpayer that submits standard monthly, quarterly or semi-annual tax returns. If multiple entities are under unified management, they can file a joint VAT tax return (management is considered unified when control is exercised through a majority of votes or other means). The minimum sales threshold is 75,000 Swiss Francs in 1995 (Eidgenössische Steuerverwaltung, 1997), and 100,000 Swiss Francs in 2010 (Eidgenössische Steuerverwaltung, 2013). However, there are many firms below the threshold still filing a value added tax return (e.g., 17.8% of returns in 2015). The following areas of the economy are tax exempt: health, social welfare, education and training, culture and sports, rental of residential properties, financial transactions, insurance and some primary production. Sales in these areas are included in the statistics only if they are conducted by companies subject to the value added tax because they also generate taxable revenue in other areas. In such cases, these companies must report their total revenue (including the exempt revenue) on their tax return.

The tabulation by sales from the 1965 establishment census includes all businesses in Switzerland, excluding agriculture, banking and insurance. Each unit of observation is a firm, defined as the smallest legally independent economic unit. Sales are reported for the year 1964 or the most recently completed fiscal year before the census period. Sales include all income from business activities, excluding taxes, subsidies, asset sales, and cost deductions. Firms with foreign branches report only revenue from Swiss operations. During the processing, the statistical office had to exclude a substantial share of firms because, due to misunderstanding in the form, many firms reported net profits instead of sales.

The Swiss tabulations by capital use the value of issued shares, calculated by multiplying the nominal value of each share at issuance by the total number of shares. The Swiss tabulations by sales use total sales of Swiss firms, including their foreign sales. This is different from the tabulations by sales in Austria, Germany, and Denmark, which do not include foreign sales. Figure IA18 shows the coverage of the sales tabulations. The left panel shows log total sales from the tabulations. The right panel shows the ratio of tabulated sales relative to GDP. This ratio has increased significantly between 1995 and 2020 (from roughly

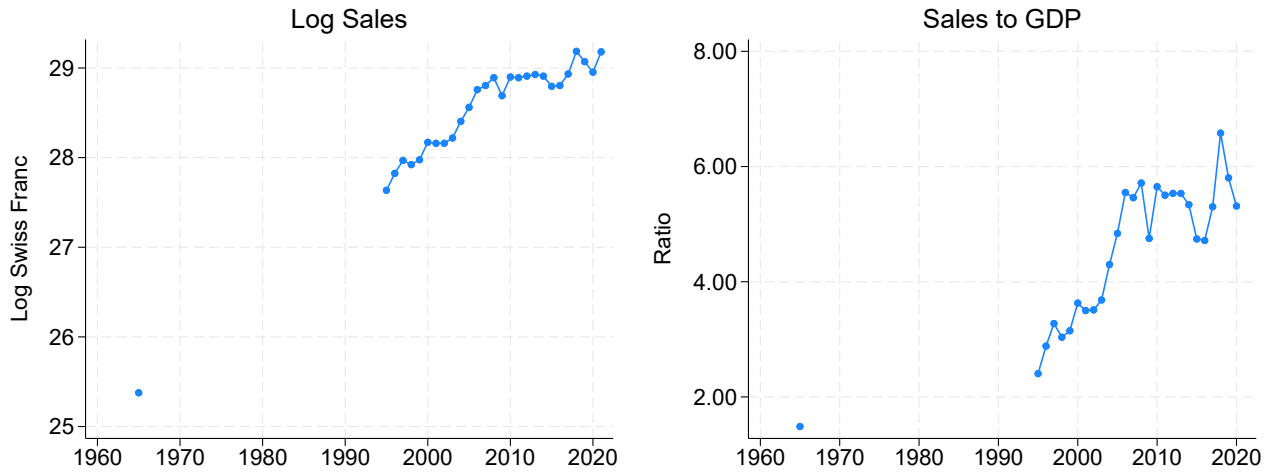


Figure IA18. Switzerland: Coverage of Sales in Tax Statistics

Notes: The left panel shows the log of all tabulated sales in our data. The right panel shows the ratio of tabulated sales to GDP. GDP data come from Jordà, Schularick, and Taylor (2016).

2.5 to 5.5). This is likely due to the rise of foreign sales, which are present in the data for Switzerland but not in other by sales tabulations.

Corporate share Since the tabulations by capital are restricted to corporations, we need to estimate of the share of corporations relative to all businesses (especially relevant for the top N shares in Section III.A). For benchmark years, we can obtain data on the corporate employment share dating back to 1929 from the Federal Business Census (*Eidgenössische Betriebszählung*) (Eidgenössischen Statistischen Amt, 1933-1998). Before 1929, we rely on the proportion of joint stock corporations among all registered businesses obtained from the Historical Statistics of Switzerland. The resulting series is shown in Figure IA19.

Data construction

- Top x% capital share = Capital of top x% corporations by capital in a given year/Capital of corporations in a given year.
- Top x% capital share among top y% = Capital of top x% corporations by capital in a given year/Capital of top y% corporations by capital in a given year.
- Top N capital share = Capital of top N corporations by capital in a given year/Estimated capital of corporations and noncorporations in a given year (starting with capital of corporations and divide by estimated corporate share as discussed above).
- Top x% sales share = Sales of top x% companies by sales in a given year/All sales in a given year.
- Top x% sales share among top y% = Sales of top x% companies by sales in a given year/Sales of top y% companies by sales in a given year.

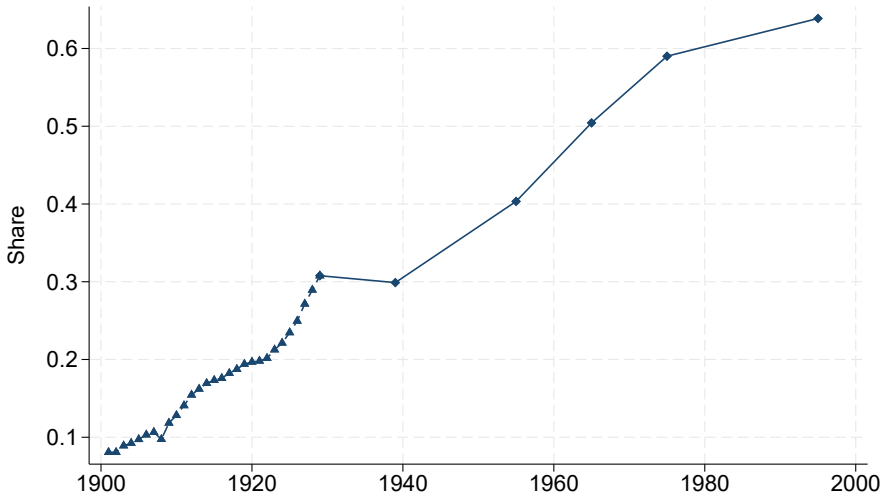


Figure IA19. Switzerland: Corporate Share Estimates

Notes: The figure shows the estimated corporate share for Switzerland. We use the corporate employment share after 1929 (solid line with diamonds), and the proportion of joint stock corporations among all registered businesses before then (dashed line with triangles).

- Top N sales share = Sales of top N companies by sales in a given year/All sales in a given year.

IA2.8.2 By Employment

Sources The data on Swiss employment concentration from 1929 to 2008 come from the establishment census ("Eidgenössische Betriebszählung") (Eidgenössisches Statistisches Amt, 1933, 1946, 1965, 1967, 1977; Bundesamt für Statistik, 1994, 2025*a*). Beginning in 1929, the Swiss statistical office started recording firms according to employment size. The final edition of the establishment census was conducted in 2008, after which it was replaced by the Business Register ("STATENT"). Tabulations by employment size were published after each census, though with varying levels of detail. For 1991 to 2008, the STATENT Team at the Swiss Statistical Office generously provided us with more detailed tabulations compared to official publications. The most recent data for 2011 to 2022 come from Structural Business Statistics (STATENT), provided to us via email by the Federal Statistical Office (Bundesamt für Statistik, 2011-2022).

Scope and variable definition The establishment census is a nationwide survey of all establishments and firms in Switzerland, excluding agriculture. The census covers all establishments where one or more individuals are engaged in full-time or part-time work for at least 20 hours per week. Each unit of observation in our tabulations is a firm, defined as the smallest legally independent economic unit. Firms can consist of multiple establishments. Defining enterprises based on legal ownership means that economic interconnections such as corporate groups are not considered. The definition of employment includes all individuals who work at least 6 hours per week, regardless of pay, including business owners, unpaid family members, and temporary workers.

In STATENT, the unit of observation is a legally independent entity with decision-making autonomy, such as making strategic choices and paying employees. An economic entity (individual or legal) that pays social security contributions on income above 2,300 Swiss Francs per year is recorded as a productive unit ("company") in STATENT (Bundesamt für Statistik, 2025*b*). The data cover all sectors of the economy and we exclude agriculture to ensure consistency with census data. The definition of employment includes all individuals (both employed and self-employed) engaged in activities that produce goods or services. Employees are recorded in the tabulation if their income subject to social security contributions exceeds a minimum threshold (2,300 Swiss Francs in 2025). Overall, the thresholds for statistical recording are lower in STATENT. In the census, a firm requires 20 weekly work hours, while STATENT defines it by an income exceeding 2,300 Swiss Francs, subject to social security. Similarly, the census sets employment at 6 hours per week, whereas STATENT considers only those earning above the 2,300 Swiss Franc threshold. As a consequence, STATENT includes a larger number of units (both employees and businesses) than census (see Bundesamt für Statistik, 2025*b*, for more detail).

Data construction

- Top $x\%$ employment share = Employment of top $x\%$ firms by size of employment in a given year/All employment in a given year.
- Top N employment share = Employment of top N firms by size of employment in a given year/All employment in a given year.

Table IA9 – U.K.: Data Sources

Type	Period	Source
Tabulations by net output	1909–1968	Prais (1976).
	1958–1992	Office for National Statistics (various years) *Census of Production*.
Tabulations by sales	1985–2022	Office for National Statistics (various years) *Size Analysis of United Kingdom Businesses*; from 2004 onwards titled *UK Businesses: Activity, Size and Location.*
Tabulations by employment	1958–1993	Office for National Statistics (various years) *Census of Production*
	1984–2022	Office for National Statistics (various years) *Size Analysis of United Kingdom Businesses*; from 2004 onwards titled *UK Businesses: Activity, Size and Location.*

Notes: This table lists the sources of the U.K. data.

IA2.9 United Kingdom

Table IA9 lists the sources that we use for the United Kingdom.

IA2.9.1 By Net Output and Turnover

Sources Our analysis for the U.K. focuses on manufacturing due to data availability in the early years. Starting in 1958, the Census of Production provides tabulations of firm size in manufacturing by net output. We obtain PDFs from the LSE digital library (Board of Trade, 1960-1973; Department of Industry Business Statistics Office, 1973-1992), and transcribe the data. Prais (1976) provides additional estimates of the share of the 100 largest enterprises in manufacturing by net output for selected years since 1909 (see Appendix A of Prais (1976) for details). Starting in 1985, we can find tabulations of the number of businesses by turnover (sales) size. We obtain PDFs from inter-library loans and transcribe the data before 1998 (Department of Trade and Industry, Business Statistics Office, 1985-1997), and download data in Excel spreadsheets from the Office for National Statistics afterwards (Office for National Statistics, 1998-2003, 2004-2013, 2015-2022). These data are based on value added tax (VAT) returns submitted to HM Customs and Excise (processed by the Central Statistical Office until 1995 and the Office for National Statistics thereafter).

Scope and variable definition The census tabulations by net output include private sector enterprises employing 100 or more persons. Each unit of observation is an enterprise, defined as establishments under common ownership or control. It is reasonable to assume that the largest manufacturers in the numerator

have more than 100 employees. We supplement these tabulations with information about the total number of enterprises and total net output in manufacturing from separate summary tables to get the proper denominator. The census data do not include foreign establishments or non-industrial establishments of manufacturing firms.[23]

The tabulations by turnover are based on VAT-registered enterprises. Each unit of observation is a legal unit before 1995 and an enterprise afterwards. The enterprise is generally the same as the legal unit but in some cases enterprises are formed from several legal units with close financial links. The VATregistration has a time-varying minimum turnover threshold, from £18,000 in 1985 to £85,000 in 2022 (Department of Trade and Industry, Business Statistics Office, 1985-1997; Office for National Statistics, 1998-2003, 2004-2013, 2015-2022). Enterprises below the VAT registration threshold are excluded before 1992, and are included afterwards if they have chosen to register voluntarily or not to de-register (zero turnover firms are excluded before 2003 and included afterwards if their employment is non-zero).

For the census data (Board of Trade, 1960-1973; Department of Industry Business Statistics Office, 1973-1992), net output is defined as "the value added to materials by the process of production (including the margin on selling any merchanted or factored goods)." It is calculated as gross output − purchases adjusted for change in value of stocks of fuel and raw materials − payments for work given to other establishments − payments for transport − net amount of any duties, subsidies, allowances and levies payable. For the turnover data (Department of Trade and Industry, Business Statistics Office, 1985-1997; Office for National Statistics, 1998-2003, 2004-2013, 2015-2022), they generally exclude VAT but include other taxes, such as the revenue duties on alcoholic drinks and tobacco. The data represent total U.K. turnover, "including exempt and zero-rated supplies" (Office for National Statistics, 1998-2003), which suggests that exports are included and foreign sales are excluded.

Figure IA20 shows the coverage of the net output and turnover tabulations. The left panel shows log total net output and turnover from the tabulations. The right panel shows the ratio of tabulated net output and turnover relative to manufacturing value added. The former is stable at around one, as net output is close to value added. The latter is stable at around three, which is sensible as turnover is close to gross output and gross output to value added is around three for manufacturing.

Data construction

- Top x% net output share = Net output of top x% manufacturers by net output in a given year/All manufacturing net output in a given year.
- Top x% net output share among top y% = Net output of top x% manufacturers by net output in a given year/Net output of top y% manufacturers by net output in a given year.

[23] For the years 1958, 1963 and 1968, the census does not include enterprise counts for firms with less than 25 employees. We extrapolate the total number of enterprises using the total number of establishments in these years (establishment counts are relatively stable between 1958 and 1970).

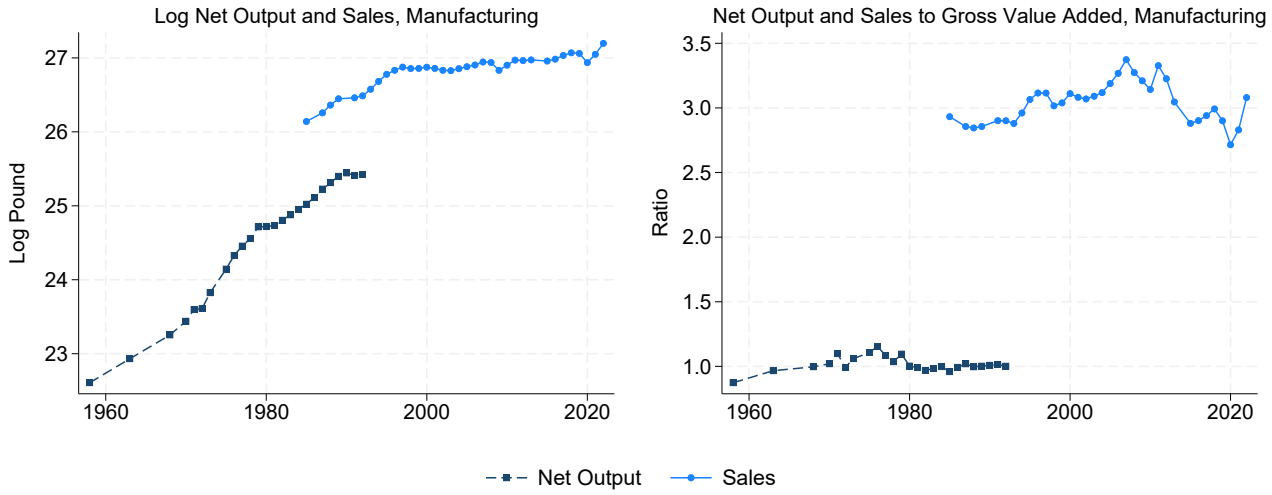


Figure IA20. UK: Coverage of Net Output and Turnover Tabulations

Notes: The left panel shows the log of all tabulated net output and turnover in our data. The right panel shows the ratio to manufacturing value added. Manufacturing value added data come from Chadha et al. (2018) and United Nations (2023*a*,*b*).

- Top N net output share = Net output of top N manufacturers by net output in a given year/All manufacturing net output in a given year.
- Top x% sales share = Sales of top x% manufacturers by sales in a given year/All manufacturing sales in a given year.
- Top x% sales share among top y% = Sales of top x% manufacturers by sales in a given year/Sales of top y% manufacturers by sales in a given year.
- Top N sales share = Sales of top N manufacturers by sales in a given year/All manufacturing sales in a given year.

IA2.9.2 By Employment

Sources Firm size by employment tabulations for manufacturing come from two sources like the above. The first source is the Census of Production, from 1958 to 1993 (Board of Trade, 1960-1973; Department of Industry Business Statistics Office, 1973-1992). The second source is the Size Analyses of United Kingdom Businesses, from 1994 to 2022 (Department of Trade and Industry, Business Statistics Office, 1985-1997; Office for National Statistics, 1998-2003, 2004-2013, 2015-2022). We use the Census of Production data until 1993 and the Size Analyses of United Kingdom Businesses afterwards because the data from the Census of Production are more granular.

Scope and variable definition The tabulations by employment in the Census of Production include private sector enterprises employing 1 or more persons. The tabulations by employment in the Size

Analysis of United Kingdom Businesses cover VAT-registered enterprises, which are described above in Appendix IA2.9.1.

Data construction

- Top x% employment share = Employment of top x% firms by size of employment in a given year/All employment in a given year.
- Top N employment share = Employment of top N firms by size of employment in a given year/All employment in a given year.