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Research Paper

Incomes and income inequality in Stockholm, 1870–1970: Evidence from micro data

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ABSTRACT

This paper analyzes incomes and income inequality in Stockholm from 1870 to 1970. The paper builds on a new dataset of 38,022 randomly sampled Stockholm residents 1870–1950, with information on income, occupation, age, gender, and household composition. This is complemented by the Census of 1930 and a Statistics Sweden sample for 1960 and 1970. Incomes were very unequally distributed between 1870 and 1920, with Gini coefficients of pre-tax income around sixty. After 1920 inequality fell quite steadily. A drop in capital incomes contributed, and when looking at post-tax incomes the growth of progressive taxation after 1930 also contributed, but most of the high inequality up to 1920 and equalization after this date depended on the distribution of labour income. In the early 1900s professional groups had huge income advantages over workers, but this advantage was drastically reduced after 1920 when working-class incomes grew rapidly. An important mechanism of income growth was the upgrading of the jobs structure, highlighting the importance of structural change, beyond the Kuznetsian binary of agriculture–manufacturing, for understanding long-run economic inequality.

1. Introduction

The industrialized countries in the early twentieth century were economically very unequal, and experienced a sharp reduction of inequality in the decades after World War I, a reduction aptly labelled “the great leveling” by Lindert and Williamson (2016, ch. 8). Various factors have been invoked to explain such a development. The effect of industrialization and GDP growth on inequality is much debated and it appears there is no linear relationship (e.g., Milanovic et al., 2011; Alfani 2021). The importance of political institutions for inequality comes to the fore in recent studies (Gómez León and de Jong 2019; Gabbuti 2021); events such as the World Wars and the Depression are also held responsible (e.g., Piketty 2003, 2014). A recurring call in the recent literature has been for a historical approach where specific episodes of changes in inequality are identified in an inductive way (Lindert and Williamson, 2016; Alfani, 2019; Aaberge et al., 2020).[1]

This paper contributes to our understanding of long-run income inequality by using detailed micro data to study incomes and inequality in the Swedish capital Stockholm from 1870 to 1970. The period offers an especially interesting case for the debate on long-run inequality, for several reasons. Stockholm grew rapidly, from a population of about 140 000 in 1870 to 313 000 in 1900 and 746

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[1] The move to more open, historical explanations is also indicated by the shift from Piketty’s emphasis on taxes, the Depression, and the world wars in *Capital in the Twenty-first Century* (2014), to a much broader focus, encompassing politics and ideology, in *Capital and Ideology* (2020).

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000 in 1950 (Appendix A1), as it industrialized and, in the postwar period, made the transition to a service economy. Incomes grew rapidly, the median real income in 1950 being 6.5 times the level of 1870. These processes allow us to explore the implications of structural change for incomes and inequality. Another reason why Stockholm is an interesting case is that the Swedish economy was quite unequal around 1900 – indeed, one of the most unequal in the industrialized world (Roine and Waldenström, 2008, 2009; Bengtsson et al., 2018; Piketty, 2020, pp. 185–186) – but experienced the greatest equalization until a low point of inequality was attained around 1980. Furthermore, vis-à-vis the literature which emphasizes the role of the World Wars and the Depression (Piketty, 2014; Scheidel, 2017), Sweden is an anomaly in that it was outside of both World Wars, neutral and never occupied, and had a relatively mild economic downturn in the 1930s (Schön, 2014, pp. 304–313). This makes it especially pertinent to investigate the mechanisms of the huge equalization which occurred in the decades after 1920.

For a historical context, our data are extremely rich. In Stockholm, unlike the rest of Sweden, the income taxation lists were also the population registers, which means that they include the whole population. We took a random sample of 1 % of the taxpayers for the years 1870, 1880, 1900, 1910 and 1920, and 0.5 % for the years 1940 and 1950; 38,022 individuals altogether were included in the dataset (Stockholm City Archive, n.d.). We complemented the dataset with data from the Swedish census of 1930 (National Archives, n.d.), the only census to have included income information, and from a Statistics Sweden random sample for 1960 and 1970 (Statistics Sweden, n.d.). While tax coverage is a good deal better in our case than in previous tax-based income inequality research – about one third of adults paid income tax in 1870 and 1880, rising to two thirds in 1920 and four fifths in 1950 – we complement the micro data by imputing incomes for those adults who earned too little to pay income tax.

The contribution to what we know about long-run economic inequality, beyond the innovative micro data approach, is a new attention to the importance for inequality of structural change and its varieties. We document that income inequality[2] in Stockholm from 1870 to 1970 developed in two episodes. From 1870 to 1920, inequality was high – the Gini coefficient was around 60 – and without trend. From 1920 to 1970, inequality fell quite continuously: the Gini coefficient fell from about 60 to the mid-fifties in 1930, the mid-forties in 1950, and below 30 in 1970. That inequality was so high in 1870 when incomes were low, and did not rise with the rapid income growth of the decades following, shows that economic growth and industrialization in themselves cannot explain variations in inequality (as in Milanovic et al., 2011; Alfani, 2021). To understand the high inequality of the 1870s and 1880s, we must recognize that Stockholm in these years was a low-wage economy with large masses of very small incomes. For example, low-paid domestic service jobs occupied 45 percent of all blue-collar workers in 1870 but only 10 percent in 1950. The low-wage service sector was crucial for the high inequality of 1870 to 1920, and its reduction was equally critical for the reduction in inequality.

Broadberry et al., 2018) have recently argued that the service sector has not attracted enough attraction in economic history research. We would add that this is true also for research on historical inequality, which has focused on the Kuznetsian manufacturing-agriculture dichotomy (Kuznets 1955).[3] Given that the decline of domestic employment was universal in the industrializing economies, decreasing for example from more than half of women workers in the US in 1870 to one third in 1900 and an insignificant share in 1950 (Dudden, 1986), the importance of domestic work for the income distribution in Stockholm has wide implications for our understanding of historical inequality. While not all countries which experienced the Great Levelling participated in the World Wars, which have been proffered as explanations, all countries experienced the decline of domestic employment.

Extant explanations of long-run inequality have often centered on the role of capital income, both internationally (Piketty, 2003, 2014) and in the Swedish case (Gustafsson and Johansson, 2003; Roine and Waldenström, 2008). Capital incomes mattered in the Stockholm case, too, but most of the change depended on changes in labour income, since labour income dominated household income both in the very unequal distribution of 1920 (labour income was 77 percent) and in the more equal distribution of 1950 (95 percent). We show that prestige professions such as executives, medical doctors, lawyers and engineers had a huge income advantage over ordinary workers in Stockholm in the early 1900s, with income ratios compared to an ordinary worker ranging from 3 for bank clerks and teachers to about 20 for executives. This advantage was partly because the high-income earners also had capital incomes, but mostly because the pay gaps in themselves were so large. The elite income advantage shrank drastically in the interwar and immediate postwar period. We relate the wide pay gaps to the low education levels of the early 1900s, and their reduction to the expansion of the education system.

The improvement of women's positions and upgrading of their jobs generally was a key part of the improvement of working-class living standards. The rise of clerical and sales jobs in the interwar period is central in accounts of women's work and historical gender inequality (Goldin, 1992; Svensson, 2003) and we show that the upskilling and upgrading of women's work in Stockholm was crucial for the changes in the income structure associated with the Great Levelling.

Finally, we address one further much-debated factor, namely the growth of progressive income taxation. Our main analyses are of pre-tax inequality, but we show that when we instead look at post-tax incomes, the main picture is further strengthened. The income taxation system did very little redistribution in the 1870–1920 period but made a difference after World War Two. Thus, as expected, the role of progressive taxation makes the reduction steeper (as in Piketty, 2014). But that the pre-tax income inequality reduction is so momentous reinforces the need for an in-depth analysis of this process.

[2] Unless otherwise stated, we discuss the distribution of pre-tax, pre-transfer incomes.

[3] But see in the early modern literature Ogilvie (2003), and in the twentieth-century literature Goldin (1992).

2. Context, data and method

2.1. Context: the city of Stockholm, 1870–1970

As discussed in the introduction, the Swedish case is especially interesting since it began with high inequality – which we will show with new detail below – but underwent a massive equalization over the twentieth century. Stockholm has played a key role in the Swedish economy, especially as a privileged trade city and as the center of finance and administration, since the early modern period. During industrialization, the capital city's importance in the Swedish economy grew (Hammarström, 1970; Söderberg et al., 1991); the city's population grew from 140 212 in 1870 to more than twice that in 1900, and 745 936 in 1950 (Appendix A1). The economy of the city was quite varied. It was the financial and administrative center of the country, as well as the home of important industrial firms such as the telephone company LM Ericsson and the engineering producer Atlas (cf. the discussion in Glete, 1987, pp. 71–91; for further context see Appendix A1). For many of the drivers of inequality identified in the literature – economic growth, industrialization, and political change – Stockholm over the hundred-year period from 1870 to 1970 is a very apt case.

2.2. Data and method

This study builds on a new sample of income taxation records, with micro data at the individual and household level. The new taxation law of 1861 (*1861 års bevillningsförordning*), first implemented in 1862, is said to have created the modern income tax system in Sweden (Lodin et al., 2017, p. 9). All non-agriculturalists who earned at least 400 kr were to pay 1 % of their net income in tax, while farmers were to pay 1 % of an assumed 5 % net yield of the value of their land. This replaced the chaotic previous system of various tax headings (Cassel, 1906; Hedlund-Nyström, 1972). In Stockholm, the taxation lists were also the population register (*mantalslängder*), which means that non-taxpayers were included. The original population registers/taxation lists for Stockholm city are held at the Stockholm City Archive (Stockholms Stadsarkiv, n.d.). We sampled 1 percent of the population in 1870, 1880, 1900, 1910 and 1920, and 0.5 percent in 1940 and 1950. See Appendix A2 for further information on the sampling. The information given in the lists is occupation (and sometimes workplace) or position in the household ("son", "wife", etc.), name, birth year, birthplace (in 1940 and 1950), and income of three kinds: from labor, from capital and from business. The household structure is given by the household-by-household presentation in the registers.

The threshold for paying the *bevillning* tax was 400 kr until 1884, when the level was raised to 500 kr; in 1903 the level was further raised to 600 kr, and in 1958, to 1200 kr (Gustafsson and Johansson, 2003, p. 194).[4] With inflation and with real income growth, the share above the threshold grew. Table 1 presents our sample, with Panel B showing the share paying income taxes. Men earned more than women, so coverage is better for men. Compared to the share covered in other tabulated tax sources used in the top incomes literature, the coverage in Stockholm is very good. The coverage (share taxpayers) in published top income studies, as surveyed by Atkinson and Piketty (2007, Table 13.0), is initially, for the early twentieth century, under 5 percent in France, 0.1 percent in the UK, and around 1 percent in the United States. In comparison, because of the low threshold for paying the *bevillning* tax, our Stockholm coverage is never lower than 30 percent. This coverage is quite good even in comparison with contemporary contexts: Splinter (2019) shows that in the US today, 36 percent of working-age adults pay no income tax, a share corresponding to our level in 1920 and 1940.

To reconstruct the income structure of the city as a whole, for the adults who did not pay the income tax – about two thirds in 1870 and 1880 and one third in 1920, 1940 and 1950 – we have imputed incomes from their occupations, as stated in the taxation lists. We use nine sectors of industry and seven sectors of service production, and further divide people first into wage-earners, salary-earners and working owners, and second by gender. For each category below the tax threshold, for example, male wage-earners in the "food, beverage and tobacco" sector, we estimate a uniform income based on wage data, contemporary social surveys and other sources. See Appendix A3 for details; there we also perform robustness checks with different procedures for the treatment of non-filers. Changing the procedure does not change the results in any substantial way.[5]

Beyond the non-coverage of those who earned too little to pay the tax, the main problem with the source is that before 1920, the *bevillning* tax did not cover dividends from domestic corporations (cf. Widell, 1907).[6] This gives a downward bias to our inequality estimates before 1920, albeit a limited one, since dividends were not a large part of income; we estimate that, in 1900, dividends in the country *as a whole* corresponded to about 2.4 percent of Stockholm incomes. In Appendix B1 we simulate the size of our downward bias

[4] It should be emphasized that the most important previous study of long-run inequality in Sweden, Roine and Waldenström (2008, 2010) use (the published tabulations of) another tax than we do. They use the state income tax (*inkomstskatt*) introduced in 1902–03, while we use the *bevillning* introduced in 1862. This, together with the overall higher coverage in cities than in rural areas, explains the significantly higher coverage in our study than in that of Roine and Waldenström (2008, 2010). In the first year that they studied, 1903, 7.2 percent of households paid the income tax that their study builds on (Roine and Waldenström, 2010, Table 7C.1).

[5] In Appendix A3, we also show the evolution of inequality for tax-filers only as well as for the top 30 percent (the share that filed taxes throughout our period). The trajectory of inequality is very similar to what we observe in our main analysis.

[6] For a discussion of the 1920 reform, see Statistisk Årsbok för Stockholm 1922, p. 127. The reason that dividends were not taxed under the *bevillning* before 1920 is that corporations were taxed alongside individuals in this period (as in the Finnish income tax used by Roikonen and Heikkinen 2020 for the years 1865-1880; see discussion on p. 50). In our estimates, we include people, but not corporations. Another problem discussed by Widell (1907) is that people with incomes in several parishes were listed separately in each parish. This is not a problem in our study since the original taxation lists in Stockholm present briefly also a person's income in other places (even if they are not taxed in the same parish).

Table 1
Sample.

Year	1870	1880	1900	1910	1920	1930*	1940	1950	1960**	1970**
Panel A. Size of the dataset										
N	2831	2483	4885	5787	6268	11,928	8822	6946		67,733
N, adults	2215	1875	3844	4468	5060	10,538	8804	6476	21,195	52,731
N, taxpayers	617	706	1318	1947	3362	7377	6277	5225	17,204	41,940
Panel B. Share of adults who paid income tax										
All	30 %	38 %	35 %	44 %	67 %	70 %	71 %	81 %	81 %	80 %
Men	62 %	82 %	76 %	78 %	82 %	80 %	86 %	93 %	91 %	86 %
Women	8 %	8 %	9 %	19 %	54 %	59 %	61 %	71 %	73 %	74 %

Note. Years 1870, 1880, 1900, 1910, 1920, 1940 and 1950 build on the sample of the population registers in the Stockholm City Archives. Adult is defined as an individual of 16 years or older.
* Data for 1930 is from the National Archive's (Riksarkivet, n.d.) digitization of records from the 1930 census, which includes income. This is an ongoing effort and we have included the observations that are available at this point.
** Data for 1960 and 1970 come from the born-on-the-15th sample. This is a Statistics Sweden (n.d.) dataset and does not build on the taxation archives. The 1960 file includes adults only.

in inequality estimates by adding dividends to the top income earners; the bias is small.

A final source problem, as with any study building on tax data, is the possibility of tax evasion.[7] At the beginning of our period, the income tax was flat at 1 percent, but over time it became higher and more progressive. Steinmo (1993, p. 25) has shown that the Swedish system of income tax was a great deal less redistributive than the US and UK until the end of the 1940s, and that the Swedish welfare state was to an unusual degree built with indirect taxes. By the 1940s, the difference in tax rate for a high-income earner and a low-income one became marked (cf. Henrekson and Stenkula, 2015, pp. 17–19). Previous researchers, who have compared taxed incomes with company wage lists and stated incomes from insurance records, have judged the income tax returns to be quite correct, with the qualification that the self-employed with good accounting skills perhaps paid less than they might have (Järnek 1971, p. 19; Olsson 1972, pp. 77–81). Bentzel (1952, pp. 29, 61–63) estimated that incomes in the 1930s and 1940s were understated by 2 to 7 percent. In the twentieth century, Sweden emerged as one of the most tax-compliant countries in the world (cf. Nistovskaya and d'Arcy 2018). Thus, we believe that while there might be a minor understatement of incomes and inequality, it should not be a major problem for our study.

3. Results: income inequality in Stockholm, 1870–1970

3.1. The macro picture: overall changes in inequality

From 1870 to 1970 Stockholm experienced two phases of income inequality; this is shown in Fig. 1, which shows the Gini coefficient.[8] (Note that until Section 3.4 all measures build on pre-tax incomes.) From 1870 to 1920, inequality was very high, and with no trend, with a Gini Coefficient between 60 and 70; no changes in these years were statistically significant at the 95 percent level.[9] The second period is one of continuously falling inequality from 1920 to 1970: the Stockholm version of the Great Leveling (Lindert and Williamson 2016).

Let us begin by analyzing the components of high inequality in the 1870 to 1920 period. Pre-tax Gini coefficients of 60 to 70 suggest a high level of inequality, but not a unique one for Nordic countries in the pre-1920 period: previous estimates of Denmark and Norway from the 1870s to 1920 show similar results (Atkinson and Søgaard, 2016; Aaberge et al., 2020; cf. Boberg-Fazlic et al., 2022). That Stockholm was an unequal economy is congruent with previous findings of high top income and wealth shares in Sweden c. 1900 (Roine and Waldenström, 2008, 2009; Bengtsson et al., 2018). Previous income studies for Sweden have not had access to comprehensive data that have facilitated the calculations of Gini coefficients, but Fig. 2 shows top income shares in Stockholm in the period 1870–1970, which may be compared to Roine and Waldenström's (2008) estimates for Sweden as a whole. From 1870 to 1920, the top decile in Stockholm caught about 50 to 60 percent of total incomes, which is higher than the 45 to 53 percent share in Sweden as a whole, but with the same trends over time. Neither Roine and Waldenström nor we have yearly data but both studies indicate that

[7] The requirement for individuals to file a tax return was legislated in 1902 (Malmer, 2003, pp. 23–25). For a detailed discussion of how this was done, see the handbook for tax-filers by Bodin and Palmgren (1902).
[8] See Bengtsson and Molinder (2023a) for the replication files for the results presented in the paper.
[9] See Appendix B2 for versions of the series with bootstrapped confidence intervals.

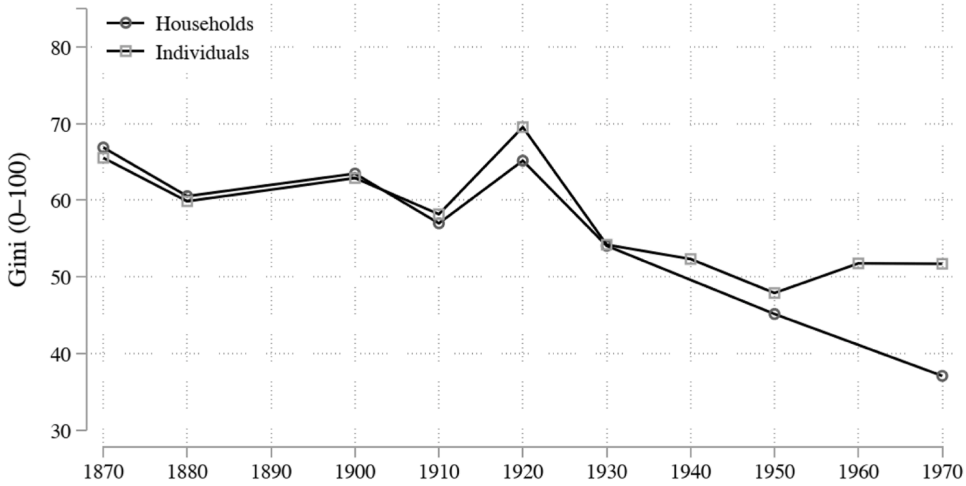

Fig. 1. Gini-coefficient for Stockholm, 1870–1970.
Note. Builds on the sample of the population registers as described in Section 2 of the paper and Appendix A2, the 1930 Census and 1960 and 1970 micro data from Statistics Sweden. Incomes of non-taxpayers 1870–1950 (except for 1930) imputed as described in Section 2 and Appendix A3.

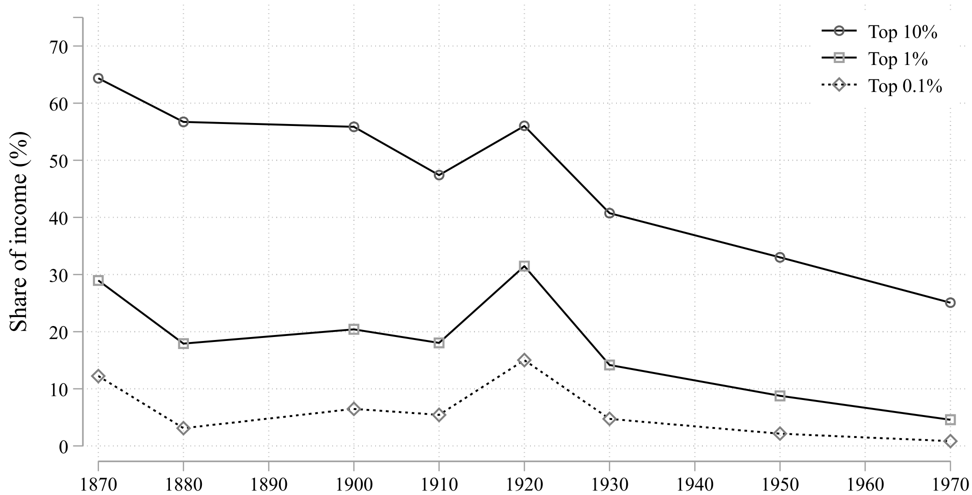

Fig. 2. Top income shares in Stockholm, 1870–1950.
Note. Builds on the sample of the population registers as described in Section 2 of the paper and Appendix A2, the 1930 Census and 1960 and 1970 micro data from Statistics Sweden. Incomes of non-taxpayers 1870–1950 (except for 1930) imputed as described in Section 2 and Appendix A3.

there was a peak in income inequality c. 1915–1920, 1916 in Roine and Waldenström's data and 1920 in our data.[10]

Given that incomes in cities are typically unequal (Kuznets 1955), and that Stockholm was the largest city in Sweden, Stockholm was probably at the high range of Swedish inequality.[11] The high and constant income inequality is consistent with the existence of stark class differentials in child mortality in Stockholm in this period (Molitoris 2017). These correspondences, as well as the comparisons with tabulated data and robustness checks in the Appendices (A4, B1, B2), support our belief that the estimates are credible. However, of course the added value of the paper is not in the description of trends over time, but rather in using the new detailed dataset to provide new evidence and perspectives on the mechanisms of the high inequality of 1870–1920 and the equalization

[10] There is a slight difference between the trends in the Gini and the top income shares: the top 1 % share grew between 1900 and 1920 while the Gini did not. This is in line with the profit-driven inequality maximum in the late 1910s and early 1920s found in previous studies of the Nordic countries (e.g., Aaberge et al., 2020). We discuss this further in Appendices A4 and B4.

[11] This conclusion is supported by a comparison with Sweden's third largest city, Malmö. The top decile's share of (pretax) incomes in Malmö was 43.7 percent in 1900, 41.8 percent in 1920, and 34.8 percent in 1950 (Svensson and Bengtsson 2023). Thus, the trends were very similar in Malmö and Stockholm, but the levels about five percentage points lower in Malmö. This is in line with the stylized fact that larger cities and cities with higher incomes tend to have higher inequality (Ryckbosch 2015).

thereafter. We now turn to that part of the investigation.

Capital income plays a central role in accounts of long-run inequality in Sweden and elsewhere (Piketty, 2003, 2014; Gustafsson and Johansson, 2003; Roine and Waldenström, 2008). Capital income was indeed extremely concentrated in Stockholm, with Gini coefficients above 0.90 both in 1920 and 1950, which may be compared with a Gini coefficient for labor income of 0.58 in 1920 and 0.45 in 1950. (See Appendix B6.) Thus, the reduction of the capital share in Stockholm households' incomes from 23 to 5 percent from 1920 to 1950 was an important part of the Great Leveling.[12] However, even if we consider only labor incomes, the Gini coefficient was still around 0.60 from 1870 to 1920, and the pattern of a Great Leveling can still be reproduced (Appendix B6).

Table 2 provides further evidence on the centrality of labour income. The table shows professionals' incomes in ratios of an average worker's income and shows both total income ratios (that is, including capital income) and labour income ratios. There are two important points in Table 2 for understanding the high inequality 1870–1920 and the shift to levelling after 1920. One is that the total income ratios are higher than labour income ratios, which indicate that Stockholm residents with high-prestige occupations also had capital incomes; not surprisingly, this component is especially important for executives. But even without considering capital income (the "Labor" columns), there is huge inequality in the early 1900s and a major equalization after that. The second point, related to the first, is simply that professionals' incomes widely exceeded those of average workers. In Stockholm in 1900 the average medical doctor had an income 9.7 times higher than the average worker; by 1940 and 1950, this ratio had been reduced to 3.7 and 2.8, respectively. For a bank clerk, the ratio was reduced from 2.6 in 1900 to 1.7 in 1950; for a professor, from 23.4 to 5.3, and for a school teacher, from 2.8 to 1.9. In the United States, a full professor in 1908 earned 4.5 times more than an average low-skilled worker and in 1942 this ratio was reduced to 2.6 (Goldin and Katz, 2009, p. 68; cf. Lindert and Williamson, 2016, pp. 201–202). Stockholm's wage/salary differentials were more drastic, which accords with the very high inequality shown above in terms of Gini coefficients and top income shares.

Income growth (as well as population growth) was rapid in Stockholm throughout the period and income inequality fell after 1920 both because of the rapid income growth of the low-paid – the average worker income grew in real terms by 72 percent from 1900 to 1920, and by 69 percent from 1920 to 1950 – and through some real income decreases for top income earners (Appendix B5). For executives in Table 2, the role of the Depression is clear, since their incomes fell very dramatically from the boom of 1920 to 1930, but for professionals, this pattern is not equally clear. We consider the factor of educational expansion below, but, as in studies of the US, it appears that institutional change also mattered: the rise of trade unionism and the changing norms of wage and salary setting in the public as well as private sector (Frydman and Molloy, 2012; Farber et al., 2021). We cannot empirically test the effects of unionization with the data used here, but we can note that the drastic reduction in income differentials after 1920 coincides with growing union influence over wage-setting in Sweden (Lundh, 2002, pp. 116–128, 132–133, 140–194; Bengtsson and Molinder, 2017).[13]

Fig. 3 further decomposes the changes in inequality by plotting the shares of income of different quantiles of the income distribution. We follow Piketty's (2014, pp. 246–268) terminology, distinguishing between the bottom 50 percent (the "lower class"), the next 40 percent (the "middle class"), and the top 10 percent (the "upper class"). From 1870 to 1920 the share for the bottom half was very small, between 15 and 20 percent,. During the interwar period and the 1940s the share grew, however, and ended about 10 percentage points higher by the 1960s and 1970s. The shift was more dramatic for the "middle class", whose income share grew from around 30 percent in the 1870s and 35 percent in 1920 to more than 50 percent by 1970. The increase in the share of income accruing to the lower and middle class was mirrored by a fall in the share of the top 10 percent of households, as already evidenced in Fig. 2.

The fate of the bottom half of the income distribution is the subject of recurring debate today (Piketty et al., 2018, pp. 581–586; Galbraith 2019), and the pro-poor profile of income growth in Stockholm 1920 to 1950 is without correspondence in the same time period in France and the United States (Garbinti et al., 2018; Fisher-Post 2020), as well as in contrast to the finding by Gustavsson et al. (2009, p. 99), using tabulated tax data, that no such change occurred in 1930 compared to 1913 in Stockholm. These differences make it pertinent to break down the way in which the bottom half of income earners changed in composition over time. We turn next to such detailed decompositions.

3.2. *The role of gender and the composition of the workforce*

Fig. 4 shows that women dominated the bottom half of the income distribution both for individuals (panel A) and households (panel B). Of the bottom half of individuals until 1920, about 85 percent were female, until the male share grew to about 25 percent. More than half of the city's population were women (Matović, 1984), and about 55–60 percent of our sample were female, but they were still over-represented in the bottom half. Panel B shows that the majority of household heads in the bottom half of the distribution were female. Until 1950, about half of this bottom half were working women; widows also formed a large share of these relatively poor household heads (as in Gothenburg; see Olsson, 1972). Of the bottom half of household heads in 1870 and 1900, less than one fifth were men, this share growing to about one third in 1920 and 1950.

From Fig. 4 we infer the importance of gender and employment intensity for the bottom half of the income distribution. Table 3

[12] It is important to note the difference between incomes distributed to individuals and households, which is what we are studying here, and capital incomes in the national accounts. The second is much larger since it also contains capital income kept in corporations. See Piketty, Saez and Zucman (2018, pp. 561-563, 568-569) for an in-depth discussion where they show that, over the twentieth century, only about one third of capital income in national accounting terms in the US was divided among individuals.

[13] Contemporary evidence suggest that group norms matter for executive compensation (Ajdacic 2022) and the same was most likely true in early twentieth century Stockholm. On the very unequal social norms in Sweden at this time, see Bengtsson (2019).

Table 2
Professionals' incomes as ratios of a worker's income, 1900–1950.

	Executives		Medical doctors		Engineers		Lawyers		Banking clerks		Professors		Teachers	
	Total	Labor	Total	Labor	Total	Labor	Total	Labor	Total	Labor	Total	Labor	Total	Labor
1900	18.2	17.6	7.1	6.9	15.9	13.6			2.6	2.6	23.4	17.4	2.8	2.8
1910	14.9	11.6	9.4	9.3	4.7	4.6	18.9	18.8	2.6	2.6	30.3	7.4	2.9	2.8
1920	27.0	12.4	2.6	2.5	4.1	3.3	4.0	4.0	1.7	1.7	20.2	5.4	2.4	2.1
1930	3.3		7.7		2.5		1.5		2.3		8.7		1.5	
1940	6.5	5.6	3.7	2.9	3.3	3.1	1.3	1.0	1.9	1.8	12.7	9.9	2.7	2.3
1950	5.7	5.2	2.8	2.6	3.0	2.9	4.0	3.7	1.7	1.7	5.3	5.3	1.9	1.7

Note. Builds on the sample of the population registers as described in Section 2 of the paper and Appendix A2, the 1930 Census and 1960 and 1970 micro data from Statistics Sweden. The measure is average income in the professional group divided by the average income for a worker. 1870 and 1880 are not included here because of the smaller sample in these years. In 1900 there were too few lawyers in the taxation sample to include in the table. The column "Total" presents total income; the column "Labor" presents labor income and professional income (from own firm) taken together, without capital income. For 1930 we cannot separate types of income since for this year we use the Census, not our taxation list samples. See Appendix B5 for the actual incomes underlying the ratios reported in Table 2.

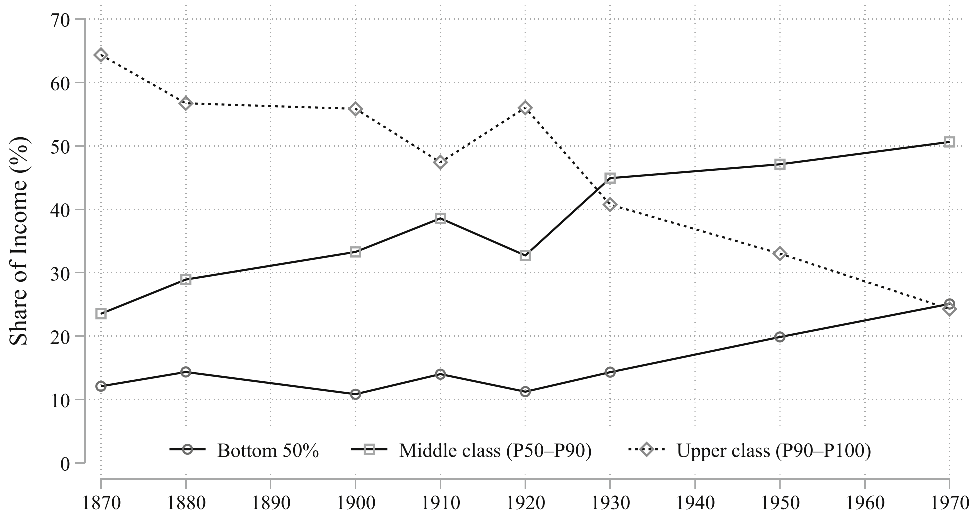

Fig. 3. Share of income by quantile, 1870–1950.
Note. Builds on the sample of the population registers as described in Section 2 of the paper and Appendix A2, the 1930 Census and 1960 and 1970 micro data from Statistics Sweden. Incomes of non-taxpayers 1870–1950 (except for 1930) imputed as described in Section 2 and Appendix A3. Measures on household level.

goes into further detail by listing the three most common occupational titles for the bottom half, the "middle class", and the top decile from 1870 to 1950. Table 3 again brings home the importance of gender: job titles with female suffixes in the original Swedish dominate the bottom half in the early years: maids, cleaners, housekeepers. But Table 3 reveals an upgrading of the Stockholm economy's composition of jobs: a good example is that in 1920, "clerk" is the most common job in the "middle class", but by 1950, it is both the most common in the middle group and the third most common in the bottom half. That one could be in the bottom half of the income distribution with such an occupation signifies the upgrading of the Stockholm labour market, and the shift from a very strong prevalence of domestic work in 1870 and 1900 to a larger share of clerical work in 1950 is especially related to the changing labour market of women. Clerical jobs were crucial for women's working opportunities in this period (Goldin, 1992, pp. 143–147; cf. Svensson, 2003; Lane, 2004, pp. 193–196).

Given the importance of elite groups for the history of inequality (e.g., Piketty 2014; Alfani 2021), Table 4 provides more detail on the elite in Stockholm: the top 1 percent and the top 10 percent of income earners, for the years 1900, 1920 and 1950. (1870 is too small a sample to facilitate detailed analysis of the top 1 percent.) The table presents the share of the top group – top 1 or top 10 percent – constituted by the occupation at hand, and the average income for this occupation within the income group. To clarify, we can take the example of merchants, the most common occupation both in the top 1 and the top 10 percent in 1900. The 1900 panel of Table 4 shows that 15 percent of the top 1 percent and 6 percent of the top 10 percent of income earners were merchants and that the average merchant in the top 1 percent earned 54 000 SEK while the average merchant in the top 10 percent earned only 18 000 SEK; it was a highly stratified business. As a comparison for each group and year, the table also states the average Stockholm income in each year.

Table 4 indicates that the most important occupation in the top 1 percent in Stockholm was merchants in 1900, but CEOs in 1920 and 1950. Given the income advantages of executives highlighted in Table 2 it is not surprising that they play such an important role

Panel A. Individuals

Panel B. Households

Fig. 4. The composition of the bottom half of the income distribution, 1870–1950. *Panel A. Individuals. Panel B. Households.*
Note. This figure shows the composition of the bottom 50 percent of income-earning units. Panel A refers to individuals and Panel B to households, more specifically household heads. Builds on the sample of the population registers as described in Section 2 of the paper and Appendix A2. Incomes of non-taxpayers imputed as described in Section 2 and Appendix A3.

within the income elite. Table 4 further underlines the importance of professionals such as professors, auditors and financial officers, side by side with more markedly *ancien regime* groups such as militaries (colonels and lieutenants both making the top 1 percent in 1900) and baronesses (the top 1 percent in 1950). The mix of career executives, professionals and ancien regime elites is most likely typical for European cities in the early 20th century.[14]

[14] Cf. Bengtsson and Molinder, 2023b, for a further study of the Stockholm income elite 1909 to 1950, with a strategic sample of two affluent areas in greater Stockholm.

Table 3
Three most common occupations by quantile and year.

Quantile	No.	1870–1880	1900	1920	1950
Top decile	1	Bookkeeper (*Bokhållare*)	Merchant (*Grosshandlare*)	CEO (*Direktör*)	CEO (*Direktör*)
	2	Trader (*Handlare*)	Trader (*Handlare*)	White collar worker (*Tjänsteman*)	Civil engineer (*Civilingenjör*)
	3	Merchant (*Grosshandlare*)	Bookkeeper (*Bokhållare*)	Engineer (*Ingenjör*)	Businessman (*Köpman*)
"Middle class" (p50-p89)	1	Workman (*Arbetskarl*)	Worker (*Arbetare*)	Clerk (*Kontorist*)	Clerk (*Kontorist*)
	2	Seamstress (*Sömmerska*	Workman (*Arbetskarl*)	Worker (*Arbetare*)	White collar worker (*Tjänsteman*)
	3	(Farm) hand (*Dräng*)	Shop assistant (*Handelsbiträde*)	Shop assistant (*Biträde)*	Chauffeur (*Chaufför*)
Bottom half	1	Maid (*Piga*)	Maid (*Piga*)	Servant (*Tjänare)*	Housekeeper (*Hembiträde*)
	2	Cleaner (*Städerska*)	Seamstress (*Sömmerska*)	Seamstress (*Sömmerska*)	Cleaner (*Städerska*)
	3	Housekeeper (*Hushållerska*)	Housekeeper (*Hushållerska*)	Housekeeper (*Hembiträde*)	Clerk (*Kontorist*)

Note. Builds on the sample of the population registers as described in Section 2 of the paper and Appendix A2. Incomes of non-taxpayers imputed as described in Section 2 and Appendix A3.

Table 4
Occupational composition and incomes of the top 1 percent and top 10 percent, 1900, 1920 and 1950.

1900							
Top 1 percent of the income distribution				*Top 10 percent of the income distribution*			
	Occupation	Share (%)	Mean income (1000 SEK)		Occupation	Share (%)	Mean income (1000 SEK)
1	Merchant	15	54	1	Merchant	6	18
2	Engineer	7	38	2	Trader	4	4
3	Lieutenant	7	13	3	Engineer	3	14
4	CEO and chief engineer	4	36	4	Lieutenant	3	7
5	Superintendent	4	32	5	Bookkeeper	3	4
6	Bank CEO	4	28	6	Captain	2	4
7	Colonel	4	24	7	Traveling salesman	2	4
8	Professor of medicine	4	20	8	Agent	2	5
9	Architect	4	19	9	Cashier	2	5
10	Trader	4	18	10	Widow of merchant	1	8
Average income of a Stockholm resident in 1900 (1000 SEK): 1.2							
1920							
Top 1 percent of the income distribution				*Top 10 percent of the income distribution*			
	Occupation	Share (%)	Mean income (1000 SEK)		Occupation	Share (%)	Mean income (1000 SEK)
1	CEO	30	371	1	CEO	7	175
2	Widow of CEO	5	127	2	Engineer	6	25
3	Building engineer	5	50	3	Merchant	2	22
4	Architect	5	57	4	Public official	2	12
5	Royal marshal	3	348	5	Traveling salesman	2	32
6	Professor	3	213	6	Trader	2	17
7	Civil engineer	3	168	7	Businessman	2	19
8	Estate owner	3	132	8	Works manager	2	9
9	Merchant	3	130	9	Department head	2	13
10	Traveling salesman	3	130	10	Architect	2	33
Average income of a Stockholm resident in 1920 (1000 SEK): 5.7							
1950							
Top 1 percent of the income distribution				*Top 10 percent of the income distribution*			
	Occupation	Share (%)	Mean income (1000 SEK)		Occupation	Share (%)	Mean income (1000 SEK)
1	CEO	23	78	1	CEO	7	45
2	Civil engineer	9	101	2	Civil engineer	5	43
3	Factory owner	9	49	3	Businessman	4	27
4	Superintendent	5	56	4	Widow	3	30
5	Professor	5	48	5	Superintendent	3	29
6	Publisher	2	261	6	Public official	3	26
7	Bank CEO	2	196	7	Auditor	2	27
8	Baroness	2	99	8	Captain	2	21
9	Public official	2	82	9	Section chief	2	23
10	Widow	2	80	10	Financial officer	2	26
Average income of a Stockholm resident in 1950 (1000 SEK): 8.8							

Note: Share is percent of all households in either top 1 or top 10 percent. Mean income is in thousands of SEK (current prices). When there is more than one occupation with the same number of observations, the occupation with the highest mean income is shown first. Translations of less than obvious titles: superintendent is *disponent*; financial officer is *kamrer*.

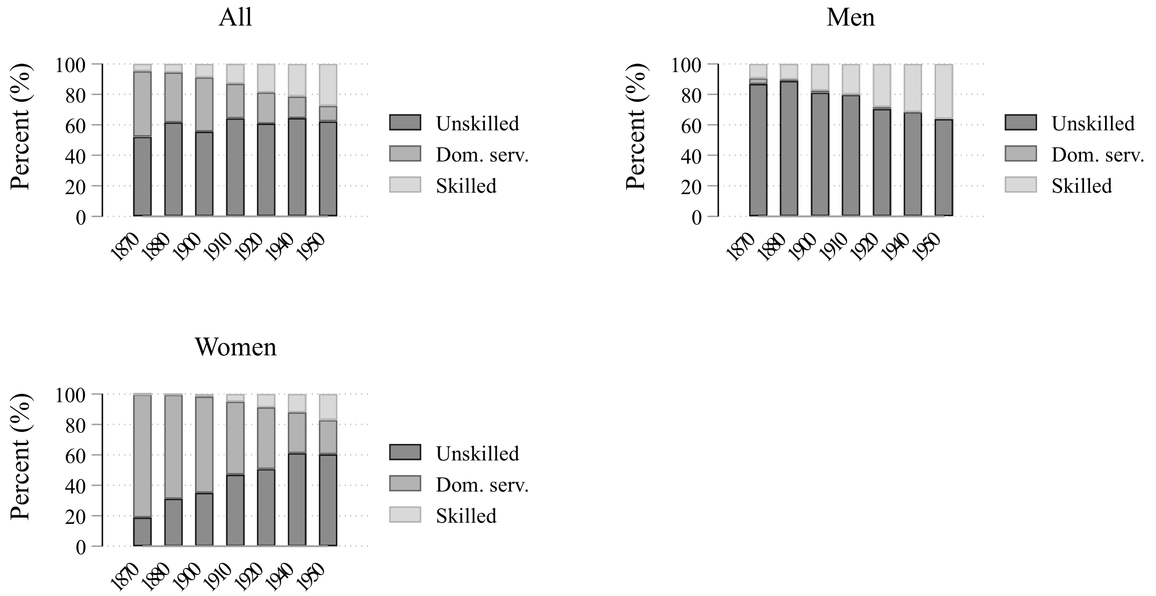

Fig. 5. The composition of working class occupations, 1870–1950.
Note. Builds on the sample of the population registers as described in Section 2 of the paper and Appendix A2. Working class defined as blue collar jobs or the contemporary Swedish definition "social group III" (cf. Smedberg 2022). Example of unskilled jobs: "fabriksarbeterska", "städerska" or "affärsbiträde", "byggnadsarbetare", "lagerarbetare". Example of skilled jobs: "montör", "poliskonstapel" or "föreståndarinna", "snickare" or "målare", "spårvagnskusk" or "styrman".

Moving from the top to the bottom of the income distribution, Fig. 5 decomposes the working class into three groups: skilled workers, unskilled workers, and a separate category of domestic servants.[15] This again underlines the centrality of domestic work: in 1870, servants made up about 45 percent of the working class, but in 1950 only about 10 percent. Given that this was a low-wage group, the finding has wide implications for income distribution. The work as a domestic servant was ill paid and offered little personal freedom (Moberg, 1978; Nordlund Edvinsson and Söderberg, 2010). If a woman changed her occupation from maid to telephone worker – a typical job available for a young woman in Stockholm at this time – her income roughly doubled, while a generic, unskilled female factory worker (*fabriksarbeterska*) earned about 50 percent more than a maid in 1920 and 1950 (Appendix B5). Thus, the massive decline in domestic servants mechanically increased the incomes of women and the working class. In relation to studies which see wage differentials as an important driver of equalization (Järnek, 1971; Olsson, 1972; Bengtsson and Prado, 2020), the decomposition here points to the fact that, on the aggregate, incomes equalized not only because of reductions in pay differentials but at least as much because of compositional shifts in the work force (cf. Svensson, 2003).

The shifting supply of skills, and the skills content of jobs or demand for skills, is a key feature in Goldin and Katz's (2009) explanation of long-run shifts in inequality, as well as in Lindert and Williamson's (2016, pp. 208–216). The focus here on the precise jobs created and disappearing gives historical detail and precision to accounts centering on supply and demand for jobs of certain skill levels. Before saying something briefly about demand and supply forces in the case of domestic work, we should start by saying that the decline of domestic service in Sweden in the 1920s, 1930s and 1940s was not simply a market process, but also influenced by politics and institutional factors. In 1926, the age-old Servants Statute (*Legohjonsstadgan*) was abolished, after pressure from the labor movement and women's groups (Moberg 1978, ch. 3). This reform rid domestic workers of some of their specific bonds of obedience, and let them take a step towards being treated like normal employees. The reform also speaks to institutional arguments on the determination of income inequality more generally. Roine and Waldenström (2008, p. 370) and Gustavsson et al., 672) have argued that much of the equalization of income and wealth inequality in Sweden occurred before 1950, before the buildup of the welfare state, which would be an argument against the case that the welfare state caused equalization. However, with a broader conceptualization of institutions, we can acknowledge that the 1920s also saw important institutional changes, part of the build-up of the welfare state in a broader sense: the implementation of the eight-hour working day in 1920, universal suffrage in 1921, the abolishing of the Servants Statute in 1926, and the growth of trade unions (cf. Lundh, 2002; Bengtsson and Molinder, 2017).

Regarding the demand for domestic service, we may go back to Table 2. In the contemporary literature on jobs polarization, it is noted that when top incomes grow, the recipients will increase their demand for low-paid, labor-intensive services, such as domestic

[15] The working class corresponds to social group III in the Swedish three-class taxonomy of the twentieth century (cf. Smedberg, 2022) and to the category of "blue-collar workers", *arbetare* in Swedish, as opposed to "white-collar" workers, *tjänstemän* in Swedish. *Arbetare* was a distinct group in Sweden in this time, as they for example had weekly wages as opposed to the monthly salaries of *tjänstemän*, and fewer privileges such as pensions systems and sickness insurance from their employer.

services (cf. Bárány and Siegel, 2018). Already Piketty (2003, p. 1027) in his seminal study of long-run inequality in France remarked that in 1914, 5 percent of the labour force was in domestic service and that this share fell to 3.5 percent in 1945 and around 1 percent in the 1960s. "The parallellism between this evolution and the evolution of top income shares is striking", said Piketty. This point holds for Stockholm as well, in the decades after 1920: as top incomes were eroded, the demand for domestic servants, typically employed by the affluent, fell. Domestic servants' wages relative to those paid to other working class women did not improve, but both groups improved their relative standing vis-à-vis the highly educated, the doctors, the professors and the lawyers (Appendix B5; cf. Bengtsson and Prado, 2020). The Stockholm bourgeoisie experienced this process in the 1930s and 1940s as a "servant crisis", when it became increasingly difficult to recruit young women into jobs with low wages, long working hours and little personal freedom (Nordlund Edvinsson and Söderberg, 2010).

Regarding the supply side, Saaritsa and Kaihovaara (2016) in an important paper on Finnish data show that it was rational in the 1920s for a working-class family who could afford some extra education for one child but not all their children, to prioritize daughters, since a little extra education allowed young women to become clerks and typists instead of domestic servants, and greatly improved their pay. For boys, a little extra education did not improve earnings so much. Bank clerks were often women (Holmberg, 2013) and, as we have seen in Table 2, banking was a fairly well-paid middle-class profession. Possible careers for women in the sector were severely limited by prevailing norms, but the shift from domestic worker (or seamstress, for that matter) to clerk or typist was in any case beneficial for a young woman.

We do not have access to the schooling level of Stockholm's residents specifically, but in Sweden as a whole, schooling expanded remarkably over our time period. Ljungberg and Nilsson (2009) have calculated the average number of standardized school years attained for 15- to 64-year-olds in Sweden, finding an increase in the average schooling attainment among working-age Swedes from 1.03 years in 1870 to 2.67 in 1900, 3.82 in 1920, and 5.60 in 1950.[16] The education level in the early twentieth century was low, at least compared to the United States (see Goldin and Katz, 2009, pp. 22–28, 244–246), and the build-up was momentous. In the 1930s, mandatory schooling was increased from six to seven school years, and in the 1960s the compulsory school was completely reformed, extended to nine years and with the tracking into shorter or longer education lines decreased. Economic studies have shown that the expansion and equalization of the school system increased future incomes especially for those from working-class backgrounds (Meghir and Palme 2005).

The structural effects of a shift out of low-paid domestic service are likely to be present in other countries and context in the same period. In the 1890s, domestic servants constituted about 45 percent of the female labour force in Britain, but over the first half of the twentieth century the share dramatically declined (Simonton, 1998, pp. 98, 183–187). In the United States in 1870 one half of women workers were domestic servants; in 1930, the share was one fifth, and a significant part of the change was, as in Stockholm in the 1910s, 1920s and 1930s, a transition into office jobs (Katzman, 1978, p. 53) Thus, it would be a fascinating task for further research to investigate the interplay between the decline of domestic service and income inequality in other contexts than Stockholm.

Fig. 6 (following the approach of Neef and Robilliard, 2021) shows all women's income as share of total income as well as women's average relative to the Stockholm average from 1870 to 1950. In 1870 to 1900, women had about 25–30 percent of total income in Stockholm; by 1940 and 1950, this share had grown to 35 percent. Compared to the per capita income, the average woman's position improved markedly: the average adult woman in 1870 had only about 40 percent of the average income in the city, and this level, despite some fluctuations, remained stable until 1920. After this, however, women's relative position improved, and in 1930, 1940 and 1950, the average woman earned almost 60 percent of per capita income. This is of course a major difference, driven both by increasing labour force participation (cf. Molinder, 2022) and by shifting to better paid jobs.

In the US context, Lindert and Williamson (2016, p. 203), building on the work of Goldin (1992), have dismissed improved gender equality as a part-explanation of the Great Leveling. But in the Stockholm case, gender seems to have mattered. Why the difference? One reason might be that we study an urban context: possibly, the income gap was more stable in rural contexts. But there is also reason to believe that there was a substantial effect in Sweden; as Molinder (2022) has pointed out, female labor force participation never shrank as much in Sweden as in the US and other countries in the mid-twentieth century, and looking at women's wages compared to men's, they also seem to have been higher in Sweden in the 1920s and 1930s than in Britain and the US (compare Prado, 2010 with Bryson et al., 2020 and Goldin, 1992).[17] Historians of women's work stress the extent of discrimination against women in Sweden in this period (Lane, 2004; cf. discussion in Frangeur, 1998) and this was substantial: job segregation was strong, and women's advance in a career was limited, as evidenced by the lack of a life-cycle growth in earnings for women (see Appendix B3). Nevertheless, our data show that women's incomes in Stockholm experienced some catch-up with men's in this period.

3.3. Decomposition: the role of gender, age, sector, and class in the equalization of incomes

In a final assessment of the role played by various factors in the equalization of (pre-tax) incomes we perform a decomposition of the variance of log income following the methodology developed by Fields (2003). This method is useful because it allows for a separation of inequality into different income- (and inequality-) generating factors. We start by estimating the following income-generating equation:

[16] Ljungberg and Nilsson (2009) define a standardized school year as one with 39 weeks of attendance. In the late nineteenth century, Swedish basic schools had per year only 24 weeks of teaching.

[17] In the contemporary context, Neef and Robilliard (2021, p. 8) report that Nordic countries have higher female income shares than other countries in Europe.

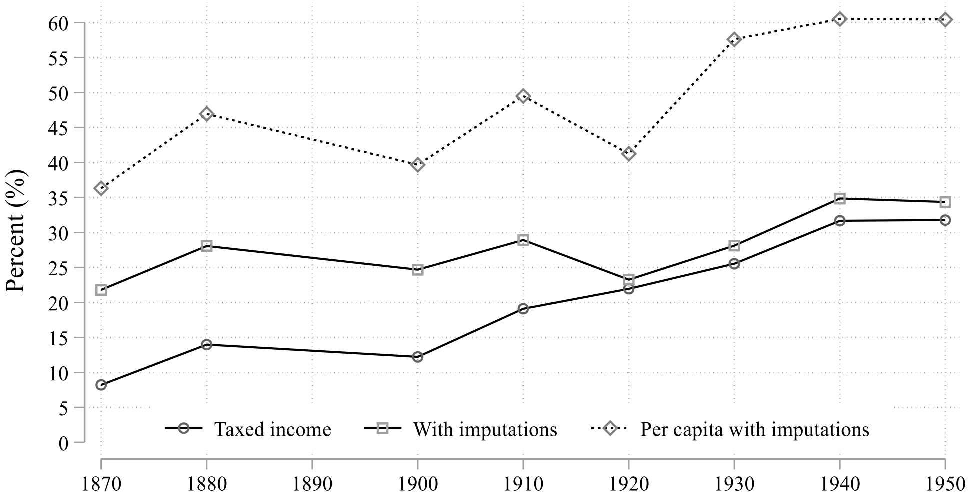

Fig. 6. Women's income as a share of total and per capita income, 1870–1950.
Note. Builds on the sample of the population registers as described in Section 2 of the paper and Appendix A2. Incomes of non-taxpayers imputed as described in Section 2 and Appendix A3. "Taxed income" is women's total taxed income as share of total taxed income. "With imputations" is women's total including imputed incomes for non-filers as a share of the corresponding total for both sexes, and "Per capita with imputations" is women's per capita income including imputations as a share of the corresponding number for both sexes.

$$\log(income)_i = \alpha + \beta \; sex_i + \gamma \; age_i + \; \delta \; age_i^2 + \varepsilon \; sector_i + \; \epsilon \; class_i \tag{1}$$

where $\log(Income)$ is the natural logarithm of the measure of income for individual *i* including imputations that we used elsewhere in the paper, β *sex* is a dummy that takes the value 0 if the individual is a man and 1 if it is a woman, γ *age* and δ age^2 are continuous variables measuring the individual's age while allowing for a non-linear relationship between income and age, ε *sector* is a vector of dummy variables measuring the individual's economic sector, and ϵ *class* is a vector of dummy variables capturing social class. Class is a four-group typology of (1) capital owners, (2) working owners and artisans, (3) salary earners and (4) wage earners. The sectoral

Fig. 7. Decomposition of pre-tax inequality.
Note. Builds on the sample of the population registers as described in Section 2 of the paper and Appendix A2. Incomes of non-taxpayers imputed as described in Section 2 and Appendix A3. The graph shows the decomposition of the predicted variance of logs for individual income (including imputations). The regression results that were used to perform the decomposition were derived from estimating Eq. (1). This was done using the *ineqrbd* command in Stata (Fiorio and Jenkins, 2021).

division has nine sub-sectors for the secondary sector, from metal and engineering to building and construction, and seven sub-sectors for the tertiary sector, from trade to domestic services. See Appendix A3 for details.

The coefficients for the income-generating factors are then estimated by OLS. Inequality at any time can be decomposed into its components using the dispersion predicted by the model. This is done by dividing the covariance of the wage generated by each factor and income, with the standard deviation of income. In the example of the impact of sex, the equation is as follows:

$$s = \frac{\sigma\beta sex_i, \log(income)_i}{\sigma^2_{\log(income)}i} \quad (2)$$

where $\sigma\beta sex, \log(income)$ is the covariance of βsex and $\log(income)$; that is, the covariance between the predicted wage due to *sex* and the actual income for individual i. Finally, $\sigma^2_{\log(income)}i$ is the variance of the logarithm of income. To calculate the share of inequality explained by each factor, we add together the shares for all dummies or continuous variables representing that factor to form the total share explained by that factor.

The decomposition results are shown in Fig. 7. We focus on the individual-level data and the 1920, 1940, and 1950 benchmarks for which we have large enough samples and all the information on individuals needed to perform the decomposition. The results show the radical impact of social class on economic inequality; the fall in overall inequality over the 1920 to 1950 period is almost completely explained by the fall in the class component, i.e. the fall in capital income, but also the decrease in salary-wage differentials as evidenced in Table 2. Second in importance is gender, which slightly increased over time despite the decline in the difference in average incomes between men and women. Sector and age played small roles throughout, the impact of the sector – the importance of which for wage differentials has been a very widespread debate in Swedish twentieth century history – remaining roughly constant while age declined in significance.

We interpret the small and invariable role played by sex as an outcome of the great stratification of male and female employment by sector and social class in Sweden during the interwar and early postwar period, as shown by Nermo (1999). Once we control for these factors, there is not much left for gender to explain. In fact, it seems from the decomposition results, that, conditional on sector and type of job, inequality between men and women increased over the period. The equalization in incomes that we uncovered in Fig. 7 was therefore completely driven by a shift in the sectors and occupations where women were working, in line with the discussion in Section 3.2 of the shift away from domestic service and into clerical and other office work.

3.4. *The role of taxes*

A final important factor for assessing the timing of equalization is the effect of taxation. In the data section we emphasized that tax progressivity was very limited in the early 1900s (cf. Steinmo 1993). This of course changed over time, and the rise of progressive taxation is central in several accounts of the great leveling (Piketty, 2003, 2014; Scheve and Stasavage 2010). To assess the impact of the tax system on the income distribution in Stockholm, we have modelled the impact of state and local taxes. (Appendix C explains our calculations in greater detail.) In brief, Swedish income taxes were low and lacked a strong progressive profile until the revisions of the tax code introduced during World War II and just after (for a comparative perspective see Scheve and Stasavage, 2010). After small differences before WWII, by 1950, households in the lowest income bracket paid 10 percent in tax, while the top marginal rate was 70 percent. Fig. 8 shows the evolution of post-tax income inequality in Stockholm 1870 to 1970, compared to the already known pre-tax series.

As expected, taxation makes very little difference to the income distribution up to and including the benchmark of 1930. After World War Two, taxation became more progressive and in 1950 the difference between the pre-tax and post-tax Gini is about 5 points, growing to 7 points by 1970. Previous accounts of long-run inequality in Sweden (Gustafsson and Johansson, 2003; Roine and Waldenström, 2008) have pointed to the importance of taxation for equalization. Our results support this conclusion, but show that even the pre-tax distribution saw important changes in the decades after 1920.[18]

4. Conclusions

Structural change in a broad sense has been at the heart of the long-run inequality debate since Kuznets (1955), but with our micro data, we can give new levels of detail and go beyond the industry-agriculture dichotomy associated with Kuznets. Broadberry et al., 2018) have recently argued that in economic history research on economic growth and productivity, “the service sector was rather neglected until recently”. Our study shows that the service sector is equally underestimated in the long-run inequality literature, which to a large extent has worked within the Kuznetsian industry-agriculture dichotomy.

The extant literature on long-run income inequality puts much emphasis on the role of capital incomes and the reduced capital (Piketty, 2003, 2014; Gustafsson and Johansson, 2003; Roine and Waldenström, 2008). Capital income and its post-1920 fall mattered in Stockholm too, and we would suggest that a promising route for future research would be to investigate the mechanisms of falling capital income using micro data such as the data used here.

However, our results show that even without a fall in capital income, and even without the rise of progressive taxation, there would

[18] The increase in progressive taxation also had implications for the difference in incomes between male- and female-headed households. In 1930, the male advantage over women was barely affected by taxes. In 1950, the difference was almost 20 percentage points smaller in post-tax terms.

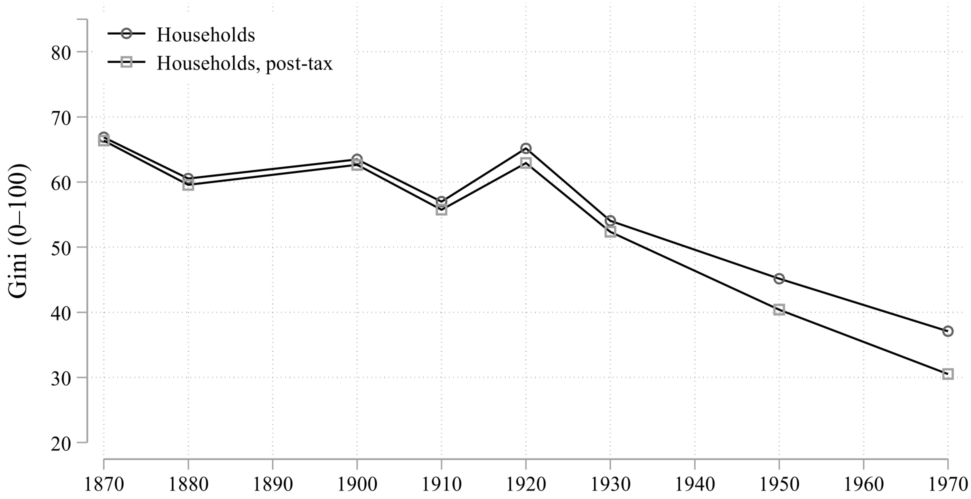

Fig. 8. Gini coefficients of pre-tax and post-tax incomes, 1870–1970.
Note: Builds on the sample of the population registers as described in Section 2 of the paper and Appendix A2, the 1930 Census and 1970 micro data from Statistics Sweden. Incomes of non-taxpayers 1870–1950 (except for 1930) imputed as described in Section 2 and Appendix A3. The 1940 sample and the 1960 Statistics Sweden sample lack household identifiers and for this reason those two years are missing in this graph. For details on the tax system and its effects on the income distribution, see Appendix C.

still have been a great leveling from the early 1900s to the mid-century, at least in Stockholm's case. Structural change, especially with a shift away from low-paid service jobs, greatly contributed to income growth and to equalization. Lindert and Williamson (2016, p. 216) have similarly argued that if technological change had a labor-using bias in the first half of the twentieth century, "it helps explain the fact that practically all industrialized countries shared the income leveling." The structural change revealed in Stockholm from 1870 to 1970 was not caused by technology alone, but we would argue that our findings, as well as the argument from Lindert and Williamson, highlight the need for further research on the complex change of the jobs composition in the 1920s, 1930s and 1940s, when much of the Great Leveling occurred. Further research considering education expansion, the demand effects of changing incomes, and technological change is needed.

Given that domestic services were a very large sector of employment also in other countries for which we have data, such as the United States, Britain and France (Katzman, 1978; Dudden, 1986; Simonton, 1998; Piketty, 2003), and that the decline of domestic service was important for equalization in Stockholm, this was most likely a factor also in the great leveling also elsewhere. An interesting task for further research is to study the gender aspect of the great leveling in further contexts, both urban and rural. Such further research would reveal if Stockholm is typical or rather special because it is a city, a big city for its national context, with the special demography and culture of a large city (cf. Matović,1984), and how much it depends on the Swedish national context. Sweden saw women-friendly policies implemented from the 1930s and 1940s onwards; for example, the 1939 ban on firing a woman because she married or gave birth, and the 1947 introduction of equal pay for equal work in the public services (Stanfors, 2007, p. 232). It seems that the reduction in the gender income gap was steeper and more persistent in Stockholm than in the United States (studied by Goldin, 1992; for a contemporary comparison see Neef and Robilliard, 2021). Again, the degree to which Stockholm was special, and the degree to which it was typical, can be determined only by further research.

Finally, our study speaks to institutional analyses. A paradox with our emphasis on structural change, which is a factor in common between different countries that experienced a more or less drastic decline in income inequality in the decades after World War One, is that Sweden was a markedly unequal country in the early 1900s, and Stockholm a markedly unequal city, and that equalization after 1920 was more radical there. The problem then becomes how to explain that cross-country *difference* in the intensity of equalization (and early inequality) by a factor held more or less *in common* between the countries. We would suggest that the interaction between institutions, norms and structural change is the probable explanation for the high levels of inequality in Sweden around 1900, since it was a country with deep political inequality (Bengtsson 2019) and with important pro-labour reforms in the 1920s, such as the eight-hour working day in 1920 (Bengtsson and Molinder 2017) and the abolition of the Servants Statute in 1926 (Moberg 1978).

Previous research on Sweden has stressed that much equalization occurred before the growth of the welfare state (e.g. Bergh, 2014). An example is when Gustavsson et al., 2009), p. 96) in their study of top wealth holders in Stockholm, based on data for seven years between 1914 and 1963, argued that the Depression and the Second World War were "more destructive phases to the wealthy of Stockholm than the growth of the welfare state." We would argue that the Depression and the Second World War might not have been the driving forces in themselves, even if they coincided with a great equalization of incomes and wealth. Of course, we have data for only every tenth year, but Roine and Waldenström's (2008) tabulated data for 1916, 1919 and 1920 and Bengtsson and Molinder's (2023b) data for 1915 and 1927 indicate that, by 1920, inequality was already beginning to decline more rapidly. It would be our hypothesis for further research that equalizing trends had already appeared during the 1920s, before the onset of the Depression in 1929–30. (While *wealth* inequality might have changed more slowly and have been more affected by the asset valuation effects of the

Depression.)

To study economic change and its interaction with inequality during the 1920s and 1930s, with more granular data, would be a promising venue for further research. With yearly data, the findings put forward here on the role of structural change and jobs upgrading for the income structure and income inequality could be tested in a more comprehensive way, and one could try to integrate the explanatory mechanisms building on structural change, with institutional factors and the role of political reforms: in Sweden, the end of the war economy in 1919; constitutional reform and the first election with universal suffrage in 1921; the return to the Gold Standard in the mid-1920s with its associated austerity policy; the Depression in the early 1930s; and so on. It is by now well established that inequality declined in industrialized economies in the decades after 1920, so an in-depth focus on the mechanisms of the inequality decline in those decades would be warranted.

CRediT authorship contribution statement

Erik Bengtsson: Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Project administration, Validation, Writing – original draft, Writing – review & editing. **Jakob Molinder:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

None.

Data availability

The authors do not have permission to share the full dataset. Replication files, and the data for 1870 to 1920 samples, are available from: https://doi.org/10.3886/E195162V1.

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Supplementary materials

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