

GGDC RESEARCH MEMORANDUM *170*

Distribution Dynamics in Turbulent Times: Income inequality in Germany and Britain, 1900-1950

María Gómez-León and Herman de Jong

February 2017

university of
 groningen

groningen growth and
 development centre

Distribution Dynamics in Turbulent Times: Income inequality in Germany and Britain, 1900-1950¹

María Gómez-León

University of Groningen, Faculty of Economics and Business
Groningen Growth and Development Centre

Herman de Jong

University of Groningen, Faculty of Economics and Business
Groningen Growth and Development Centre

July 2017

Abstract

Using dynamic social tables, which have not been used for European countries before, we contribute by providing new data on inequality in Germany and Britain on an annual basis for the first half of the twentieth century. Inequality trends in these two countries tended to follow totally opposite movements. The decline in inequality in Germany was interrupted during the WWI and the Nazi period, while in Britain the reversal took place between the end of WWI and the Great Depression. These results challenge the idea of an egalitarian revolution across Europe during the twentieth century and support the notion of inequality cycles.

Keywords: Inequality, dynamic social tables, interwar, Great Leveling, Germany, Britain

JEL codes: N33, N34, 015

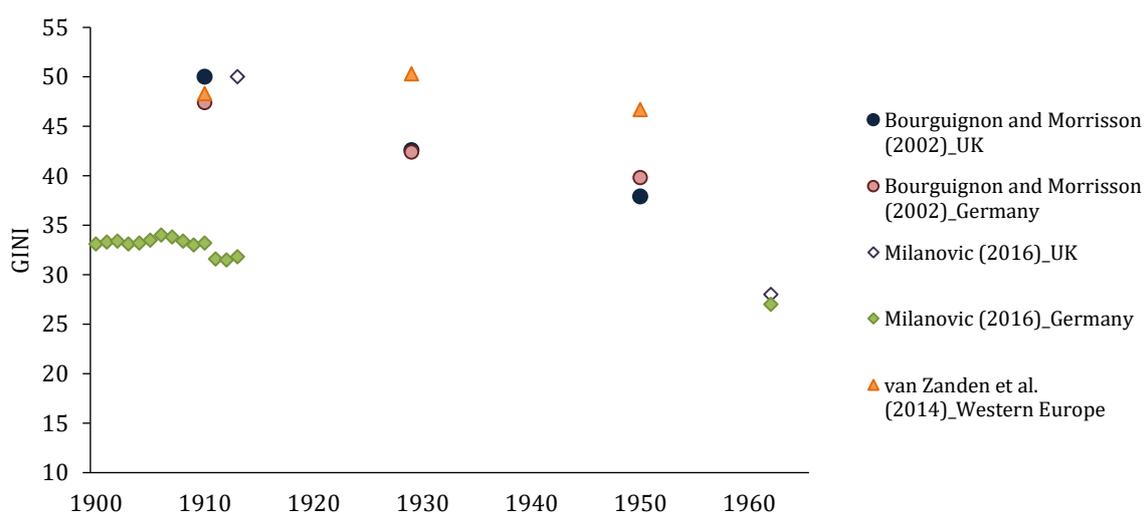
¹ This research is supported by a grant from the Netherlands Organisation for Scientific Research (NOW-016.130.036). Earlier versions of this paper were presented at the *Globalization and Inequality* Summer School (University of Groningen, 2016) and the *Macrohist Interwar Economic History Workshop* (LSE, May 2017). We are very grateful to Branko Milanovic, Leandro Prados de la Escosura and Joost Veenstra for detailed comments and suggestions. We also thank Stefan Nikolic, Daniel Gallardo and Oisín Gilmore for helpful earlier suggestions. The usual disclaimer applies.

1. Introduction

In recent years a number of influential studies on the historical evolution of inequality and its causes have raised new interest in the topic (Alfani 2015, Lindert and Williamson 2016, Milanovic 2016, Piketty 2014). While it seems clear that inequality declined in Western European countries during the twentieth century until approximately the 1980s (Lindert and Williamson 1985, Milanovic 2016, Piketty 2014, van Zanden et al. 2014) the slowdown – commonly referred to as the Great Leveling or egalitarian revolution- has been attributed to different drivers, from demographic and economic factors (Kuznets 1955) to political forces (Piketty 2014) or the interplay of the above (Milanovic 2016).

But was the deceleration of inequality continuous and alike across European countries? Could different inequality forces have led to different patterns? Turbulent periods during the first half of the twentieth century -including two World Wars and the Great Depression- seen from different economic, social and political contexts suggest that inequality trends might be very different across European countries. Yet, we have little empirical evidence due to the lack of data on income distribution before 1950, especially for the interwar years. This omission may be particularly relevant where, as shown in Figure 1, claims of the above-mentioned drop in inequality during the first half of the twentieth century are based on scattered years in which the interwar period has been neglected.

Figure 1. Inequality in Western Europe, 1900-1962



Sources: In Milanovic (2016) German data are from Grant (2002), while for UK the original sources are Lindert and Williamson (1983, table 2) and the Institute of Fiscal Studies.

Notes: Western European countries included in van Zanden et al. (2014) are Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Portugal, Spain, Sweden, and U.K.

Moreover, studies covering the whole period infer inequality trends from the evolution of proxies such as the top income shares (Atkinson and Piketty 2007, 2010) or wage differentials (Söderberg 1991), which only include particular segments of the distribution. Although providing data on an annual basis, these studies lead to fragmentary conclusions drawn from isolated parts of the picture.

In this paper, we move beyond previous attempts in two ways. We develop dynamic social tables for two leading European countries, Germany and Britain, and obtain annual direct estimates on inequality from 1900 to 1950. Dynamic social tables have not been used for European countries before. We contribute by providing new data on inequality in Germany and Britain on an annual basis for the first half of the twentieth century. Secondly, we shed new light on the forces behind inequality changes within these two countries by exploring the whole range of the distribution, as well as on the factors explaining the differences between them.

Evidence from Germany and Britain suggest that the drop in inequality was neither steady nor equal, clashing with the idea of an egalitarian revolution across Europe during the twentieth century (Lindert and Williamson 1985, 346, Milanovic 2016, 53, van Zanden et al. 2014, 290). Indeed, inequality trends in these two countries tend to follow totally opposite movements and support the notion of inequality cycles –Kuznets curves- suggested by Milanovic (2016) and illustrated by the Spanish example in Prados de la Escosura (2008).² The decline in inequality in Germany was interrupted during the WWI and the Nazi period, while in Britain the reversal occurred between the end of WWI and the Great Depression.

Moreover, we find that for Germany before 1933 and from 1939 onwards, changes in the income distribution were driven by both the variation in the relationship between property and labour incomes as well as changes in the labour earnings dispersion, while during the Nazi period only differences between owners and labour earnings led to changes in inequality. In Britain, earnings dispersion among workers appear as the main driver of inequality changes before WWI and after 1939. During the Great War and the interwar period both differences between proprietors and workers as well as changes in earnings dispersion caused inequality variations. Our conjecture is that political factors played an important role in driving inequality trends during this period.

² For the case of Spain, Prados de la Escosura (2008: 297) found that: “the evolution of inequality presents the shape of a wide inverted W with peaks in 1918 and 1953 that, perhaps, could be part of one big Kuznets curve broken by the Civil War and its autarchic aftermath”.

Our paper is structured as follows: Section 2 discusses indirect approaches for inferring inequality before 1950 and suggests dynamic social tables as the potential source for obtaining direct estimations of inequality. Section 3 focuses on the construction and standardisation of dynamic social tables. Section 4 shows inequality trends obtained from social tables in these two countries as well as the potential forces behind inequality changes. Section 5 analyses how periods of economic expansion and economic recession affected different social groups in both countries by means of the construction of growth incidence curves (GICs). Section 6 concludes.

2. Measuring inequality prior 1950

The lack of historical data on inequality for periods before 1950 has been mentioned by several authors. For instance, Milanovic (2016, 75-8) noted that “[after 1913] the next data point that we have for British inequality is unfortunately almost half a century later (1962) [while] the data for Germany are fragmentary [with] a long hiatus between 1913 and 1963”. Similarly, for Britain, Atkinson (2007, 90) claimed that “the interwar period has been strangely neglected [...] Soltow (1968) did not use any data for the interwar period, going direct from 1913 to 1962. Williamson’s analysis (1985) stops in 1913; [and] Lindert (2000) goes direct from 1911 to 1938”. In the same vein, Dell (2007) refers to former attempts to assess income distribution in Germany before WWII, which stops in 1913 (Geisenberger and Müller 1972) or at best in 1919 (Procopovitch 1926).

While the evidence is limited, given the scarcity of data on income distribution for the last century, other authors have tried to fill in the gaps in several ways. Bourguignon and Morrisson (2002), in their study of *inequality among world citizens*, use data on mean incomes from Maddison (1995) together with 33 income distributions of uneven coverage where similar countries are assumed to have the same income distribution as the country for which historical data is available.³ This implies that countries within a geographical area tend to share the same income distribution. Thus, Bourguignon and Morrisson’s approach offers a simplified picture of inequality in Western Europe, where they include more than 20 countries.⁴ Van Zanden et al. (2014, 280) note that in Bourguignon and Morrisson’s work “for

³ This point is made by Milanovic (2011, 495).

⁴ The sample includes Western European countries and offshoots: Argentina, Chile, Australia, Canada, New Zealand, Austria, Czechoslovakia, Hungary, France, Germany, Italy, Scandinavian countries, Spain, Portugal, Switzerland, Benelux, and microstates, United Kingdom, Ireland and United States.

the period before 1950 [...] changes in income inequality within countries are clearly underestimated”.

Hence, van Zanden and co-authors enlarged the number of observations of inequality within countries using backward projections of a national Gini coefficient based on the evolution of indirect estimates such as the unskilled-wage/GDP ratio and the distribution of male adult heights. This approach improves the work of Bourguignon and Morrison since it incorporates inequality of individual countries. However, the use of these proxies generates important shortcomings. First, the ratio between unskilled wages and GDP, introduced by Williamson (1997), although easily computable for most countries, led to inconsistent and exaggerated comparisons over time (Prados de la Escosura 2008, 5-6).⁵ Second, the distribution of adult heights is more an indicator of health and well-being during a particular period in life (Floud et al. 2011), and there are factors other than income that are more important in explaining the development of heights, such as food availability, exposure to disease and work load. In any case, inequality has only an indirect effect on these factors.

Finally, authors inferred inequality within countries from the evolution of the top income shares based on tax records. This approach was introduced by Kuznets (1953) and extensively applied by Atkinson and Piketty (2007, 2010) and Piketty (2014). Although available for most countries over long spans of time, this indicator is likely to underestimate inequality as only a share of the population is subject to taxation and therefore does not reflect what happens at the 99% -or even 90%- bottom part of the distribution.⁶ This omission is particularly important during eras of rapid structural change –e.g. coinciding with an increase in the skilled labour force- when changes in inequality are mostly linked to increasing differences between the middle and the bottom part of the income distribution. Therefore, these proxies do not provide a comprehensive measure to examine the whole distribution and are not able to capture *inequality between groups* and *within groups* together. In this respect, the best way to obtain direct estimates of the income distribution is the construction of so-called social tables.

⁵ Since this measure compares the returns to unskilled labour with the returns to all production factors, a fall indicates that unskilled labour returns increase slower than GDP per head, suggesting increasing inequality. Consequently, as pointed out by Prados de la Escosura, inequality over long spans of time becomes overstated as the increasing skilled labour force in developed societies is translated into a lower proportion of unskilled workers, and thus a drop in the ratio increasing inequality.

⁶ Atkinson, Piketty and Saez (2011, 4): “our series also suffer from important limitations [...] the series measure only top income shares and hence are silent on how inequality evolves elsewhere in the distribution.”

Essentially, social tables provide a concise and complete description of the social structure by collecting data on the number of people belonging to different social groups – or classes- and the estimated average incomes that can be linked to these groups.⁷ Indeed, the methodology applied for such a construction is very similar to that used for the reconstruction of Historical National Accounts. Notably, social tables have been particularly useful for assessing inequality in earlier periods.⁸ For Europe, in particular, apart from those for Britain (Lindert and Williamson 1982, 1983), we can find examples of social tables for France between 1788 and 1894 by Morrisson and Snyder (2000) and for different European cities after 1500 by Hoffman et al. (2002) and van Zanden (1999).⁹ For all these cases, social tables were estimated in a static way (that is, for isolated benchmark years). In this paper, we implement, for the first time, dynamic social tables for Europe, in which both the population shares and income of different social groups move on an annual basis.¹⁰

Although dynamic social tables provide an unusually rich account of the income distribution of a given population, we are aware that they are less detailed than data derived from household surveys. Since social tables are not a household based source they cannot account for family formation. Consequently social tables tend to be more biased, with greater female labour force participation.¹¹ Moreover, as stressed by Milanovic (2011, 496), there may be another important source of bias in the social tables that could underestimate inequality when the number of groups is small or when the members belonging to one group are considered to share the same average income.

⁷ Henceforth we use the terms “social classes”, “social groups” and “occupational groups” interchangeably.

⁸ See for instance Campbell (2008) for medieval Britain (c. 1290); Milanovic (2006) for Byzantium in year 1000; Milanovic, Lindert and Williamson (2011) for several societies ranging from the first-century Roman Empire to 1872 Brazil; or the most recent work by Lindert and Williamson (2016) on unequal gains in America since 1700.

⁹ The first social table was developed by King in 1688 to estimate the size and the structure of the English and Welsh population (Barnett 1936). Following King, other British social tables were created by Massie for 1759, Colquhoun for 1801-1803 and Baxter for 1867. Then Lindert and Williamson (1982, 1983) updated those to explore the British income distribution up to 1913. Most recent revision on England’s social tables is that of Allen (2016), who considers servants as a separate group and includes employment and earnings of women and children.

¹⁰ For some Latin American countries, other authors have applied dynamic social tables, which maintained the population shares fixed but let the income of different social groups change annually (see Bértola, Castelnovo and Willebald (2008); Gómez-León (2015); and Rodríguez-Weber (2014). In this paper, we implement more “dynamism” by allowing the population shares to fluctuate annually and considering the role of population shifts on inequality changes.

¹¹ When both men and women work and we do not know anything about family formation, inequality calculated by the use of social tables could be either underestimated (in case of assortative mating) or overestimated (if rich men/women marry poor women/ men).

In this sense, social tables become less reliable the closer we move to “modern” economies with heterogeneous societies. However, they are a great tool for less modern economies and a good alternative to surveys. First, very few countries conducted household surveys before the 1970s. Second, with the use of social tables we avoid the most important problem of household surveys, namely, the imperfect inclusion of people at both ends of the income distribution (Atkinson 2007, 84, Milanovic 2016, 15).¹² Third, the potential bias linked to a small number of groups might be corrected by introducing the largest possible level of disaggregation within each occupational group. Indeed, when testing the sensitiveness of the Gini coefficient to the number of groups, Milanovic, Lindert and Williamson (2011), found that it is relatively small.

3. Building dynamic social tables for Germany and Britain

Social tables compile information on social classes with their associated average income and the number of individuals that can be linked to this income. Most previous social tables estimated average incomes from consumption patterns (Hoffman et al. 2002) or tax records (Campbell 2008, Morrisson and Snyder 2000). There are however some disadvantages linked to the use of these sources. For example, there are relatively few historical household budgets for the period before the 1950s, and therefore these are un-representative of the population (A'Hearn, Amendola, and Vecchi 2016).¹³ Similarly, only a very small proportion of the population is susceptible to be included in tax records. According to Prados de la Escosura (2008, 291): “only a very small fraction of the population was subjected to individual income taxation in many countries prior to the mid twentieth century, while fraud and tax evasion challenge the reliability of fiscal records as we move back in time.”

In this paper, we construct our social tables with information on the active population structure provided in the occupational censuses. Notably, by using occupational censuses we include between 50 and 60 per cent of the total population distributed by professions - including owners at the top and unoccupied people at the bottom of the distribution- which circumvents previous problems of representativeness. We next compile nominal income

¹² At the bottom part of the distribution homeless, students, and people in sanitary or penitentiary institutions are not included in the surveys. Meanwhile, at the top, the richest people tend to underreport incomes or even refuse to participate in surveys.

¹³ As pointed out by A'Hearn, Amendola and Vecchi (2016, 16): “The lack of underlying probabilistic survey design means that no collection of historical budgets, no matter how large, can be assumed be a statistical sample representative of the population. Some strata will be under-represented, others unrepresented altogether in the data.”

data linked to each profession from different sources. All German and British sources used in the paper are detailed in Tables A3.1 and A3.5 of the Appendix, distinguished by period, type of data and sectors. For German average earnings we mostly rely on data of Hohls (1995). British data on average earnings are taken from Feinstein (1972, 1990, 1995) and Chapman (1953). Additionally, we use information from secondary sources to estimate the relative differences in earnings across work categories and gender. The most important assumptions are explained in this section and further detailed in the Appendix.¹⁴

We use average earnings, instead of wage rates, because earnings include other types of income such as payments in kind and bonuses for overtime and night work (Feinstein 1972, Scholliers 1989). This is important because, as pointed out by Scholliers (1989, 15), “if the development of the standard of living [and extensively inequality] is to be investigated, it should be kept in mind that wages are not the only source of income.”¹⁵ Therefore, using earnings allows for the inclusion of different sources of income (except government transfers) and provides a more reliable picture of the pre-fisc income distribution. The use of market income is not a problem as long as redistribution (by government transfers and taxes) is small. For the cases of Germany and Britain, Broadberry and Burhop (2010, 412) showed that redistribution schemes operated on a very small scale until World War II. Moreover, the choice of pre-fisc incomes, as argued by Lindert (2000, 6), entails a larger intellectual challenge when explaining the forces behind inequality as the redistributive component of post-fisc inequality is, instead, transparently attributable to government.¹⁶

In a similar vein, by applying specific assumptions (for example, the incorporation of differences by gender and work status) we can obtain a more comprehensive picture of the whole social structure. In this respect Allen (2016, 14) argued that “[t]he more fully the tables are elaborated, the more powerfully they illuminate social change”. Introducing specific assumptions requires a more thorough investigation and deeper knowledge of the countries’ institutional context. For instance, an important question is how legislation and the bargaining power of unions affect the evolution of owner’s profits, skill premiums and gender inequalities in these two countries. We will now discuss the sources of the data used in the construction of the social tables for Germany and Britain in more detail.

¹⁴ Consult from Table A3.2 to Table A3.4 for Germany, and from Table A3.6 to Table A3.8 for Britain.

¹⁵ This idea was also pointed out by Chapman (1953, 8) and Bry (1960, 124).

¹⁶ Indeed, as Lindert (2000, 6) argued “pre-fisc is not even pre-fisc, inasmuch as prior fiscal interventions, such as state tax, affect the inequality of this year’s original incomes.”

Germany

In order to build the dynamic social table for Germany, information on the active population structure (by profession) is obtained from the occupational censuses (*Berufzählungen*) of 1907, 1925, 1933, 1939 and 1950, respectively, and summarised in the Statistical Yearbooks (*Statistisches Jahrbuch*).¹⁷ For the occupational censuses individuals were asked about their main occupation and were grouped according to their work category and gender. The 1907 census includes the population in the German Empire. The censuses of 1925 and 1933 refer to the resident population in the German Empire without the Saarland, Posen, West Prussia, Alsace and Lorraine. The census of 1939 includes the Saarland (reincorporated in 1935) and the territories of Austria and the Sudetenland acquired up to that time. For 1950 we totalled the resident population reported in the German Democratic Republic census and the resident population in the Federal Republic of Germany (including Saarland and Berlin west).

For each occupation, the censuses distinguish between four main work categories: (a) self-employed (*Selbständige*) including owners (*Eigentümer*), tenants (*Pächter*) and managers (*Betriebsleiter*); (b) salaried personnel (*Angestellte und Beamte*) including employees and officials; (c) wage earners (*Arbeiter*) and (d) family workers (*Mithelfende Familienangehörige*). For standardisation, we have re-classified work categories into three: (a) “owners”; (b) “salaried personnel” including tenants, managers, employees and officials; and (c) “wage earners” including family workers.

Moreover, to make censuses comparable across time, the number of occupations has been standardised to 22. This results in 78 classes structured as follows. There are 18 professional occupations, each with two working categories (salaried personnel and wage-earners) which are disaggregated, in turn, by gender (male and female). Next, there are four more classes for domestic servants and unemployed people (two for males and two for females).¹⁸ Finally, two classes of owners (one in agriculture and one in industry and commerce) are being distinguished.¹⁹

¹⁷ See Statistisches Reichsamt (several years) for *Statistisches Jahrbuch* of the German Empire; Staatliche Zentralverwaltung für Statistik (several years) for *Statistisches Jahrbuch* of the German Democratic Republic, and Statistisches Bundesamt (Statistisches Bundesamt several years) for *Statistisches Jahrbuch* of the Federal Republic of Germany.

¹⁸ An example of the social table for the first census benchmark year in 1907 can be found in Table A2.1 of the Appendix.

¹⁹ Here males and females are aggregated since we assume no gender discrimination in the receipt of income from ownership.

Table 1. Number/ structure of occupational groups and classes in Germany

Occupations			Domestic services/ without profession			Owners		Total	
Number of groups	Class distinction by:		Number of groups	Class distinction by:		Number of groups	Class Distinction by:	Number of groups:	Number of classes:
	Work status (2):	Gender (2):		Work status (1):	Gender (2):				
18*	Salaried employee / wage worker	Male/ female	2	Wage worker	Male/ female	2	Agric./ Indust.& Serv.	22	78

*These are: agriculture; mining and quarrying; building; metal working; chemical industry; paper and printing; wood and furniture; textile; leather; clothing and cleaning; food, drinks and tobacco; trade; transport; public administration; liberal professions; insurance, banking and finance; catering and personal services.

Once the censuses were homogenised, we applied interpolation methods between the census benchmark years in order to obtain annual data on the active population structure of Germany between 1907 and 1950.

The next step is to allocate annual average incomes for the 22 occupations that we standardised in the occupational censuses. For this purpose, we mostly rely on Hohls (1995), who compiled data on average earnings from the accident insurance statistics. Hohls (1995) provides data for 10 sectors: agriculture; mining; construction and civil engineering; industry of basic materials and capital goods; consumer goods industry; industry of food and related products; trading; transport and post; public administration and services. The branches that were included in these sectors can be found in Table A3.1 of the Appendix.²⁰

Next, we estimated earnings in 10 additional branches in two steps. We first calculated the relative differences of earnings (in percentages) among branches from other sources such as the Board of Trade (1908), Bry (1960), Hoffmann (1965) and the *Statistisches Jahrbuch* (1913-1950).²¹ We then applied the obtained percentages to Hohl's (1995) data. For instance, based on Hoffmann (1965) we estimated average earnings in domestic services as 30 per cent of Hohl's average earnings in Services. Details on the

²⁰ For example, the sector "consumer goods industry" is formed by the following branches: ceramic and glass; woodworking; paper; printing; leather; textile and clothing.

²¹ As for Hohls (1995), branches included in the Board of Trade (1908) Bry (1960), Hoffmann (1965) and *Statistisches Jahrbuch* (1913-1950) are shown in Table A3.1 of the Appendix.

additional branches can be found in Table A3.2 of the Appendix.²² Note that there is no available data on average earnings for the hyperinflation years 1921-23. The information on relative earnings from the *Statistisches Jahrbuch* (1913-1950) and the Board of Trade (1908)-namely for industrial branches- is only available for some benchmark years (1905, 1913, 1925, 1933, 1939, 1949). We observe, however, that relative differences tend to remain similar across benchmark years. Nonetheless, the final ratio that we used is an average of all benchmark years.

Assumptions on earnings differences by work status were estimated using the salary ratio-to the mean and the wage ratio-to the mean obtained from Bry (1960) and *Statistisches Jahrbuch* (1913-1950) (Tables A3.3).²³ Earnings differences by gender across branches were estimated using the gender ratios –female earnings as a percentage of male earnings- obtained in Bry (1960) and *Statistisches Jahrbuch* (1913-1950) (See table A3.4 in the Appendix). As with the relative differences among branches, the information on skill premiums and gender ratios are only available at particular benchmark years as shown in the respective tables.²⁴

Finally, data on proprietors' income are from Bry (1960, table 10) and the information provided in the *Statistisches Jahrbuch* (1907, 1913, 1925, 1933, and 1939) on the National Budget (*Part XV. Volkswirtschaftliche Billanzen*), which distinguishes between different sources of national income such as private income from agriculture and forestry and private income from trade and industry. Here, totals on property income from forestry and industry are respectively divided by the total number of independent proprietors either in agriculture or industry, which are available for some benchmark years (1907, 1925, 1933, and 1939) in Bry (1960). Estimations between benchmark years have been interpolated and from 1939 projected forwards according to the evolution of consumer prices (Metz 2016).²⁵

²² Income for “unoccupied” –absent in the table- is assumed to be equal to that of the lowest income group- that is, domestic servants. We tested the inclusion of 0 income in the “unoccupied” group. This obviously affects inequality levels (raising Gini coefficients by 0.06) but not the inequality trends.

²³ This information mostly correspond to negotiated wages and salaries.

²⁴ An example of these calculations at particular benchmark years can be found in Figure A3.1 of the Appendix.

²⁵ See Rahlf (2016) The German Time Series Dataset 1834-2012.

https://figshare.com/articles/German_Time_Series_Dataset_1834_2012/1450809/1

Britain

To reconstruct the British dynamic social table, we compiled the active population structure by profession reported in the occupational censuses of England and Wales, available for every decade (1901, 1911, 1921, 1931 and 1951). These censuses registered the profession declared by individuals distinguished by work categories (employers, managers, wage-earners, and those working on their own account) and gender.²⁶ To make our sample comparable to that of Germany, we aggregated those individuals working on their own account and employers into a single group identified as “owners”. Like in Germany, before applying linear interpolations between census benchmark years, classes have been standardised into 78, following the same structure used in the former (shown in table 1).²⁷

Annual estimations on the average earnings associated with each professional category by work status are based on Feinstein (1972, 1990 and 1995), Chapman (1953) Routh (1965) and the *Historical record of the census of production* (Business Statistics Office 1978) which is described in Tables A3.6 and A3.7 in the Appendix.²⁸

We compiled average wage-earnings across 20 different occupations by period (table A3.6). From 1900 to 1913 we have used Feinstein’s (1990) 1911 benchmark estimates on average full-time earnings projected backwards and forwards with the wage indexes (1911=100) at particular sectors also provided in Feinstein (1990). From 1913 to 1920 we applied forward projections from 1913 based on the evolution of “total manual” earnings in Feinstein (1995). From 1920 to 1950 we mostly rely on Feinstein’s data (1995) at main sectors. For branches lacking in Feinstein (1995), we used Chapman (1953) for the period 1920-1938. From 1938 to 1950 we estimated earnings in missing sectors by applying Feinstein’s (1995) data of the relative differences (in percentages) obtained from the *Census of Production*. Since these percentages can be only estimated at census benchmark years (1935, 1948, 1949, 1950), like in Germany, we applied the average.

We obtained estimations of salary earnings of 20 occupations (Table A3.7). Between 1900 and 1920 the main source is the skill premium - salary earnings as a percentage of

²⁶ Unlike the 1930 and 1950 censuses, former censuses did not provide a clear division of the employees between manager and wage-earners, however in most cases the name of the profession itself allows us to allocate them to one group or another.

²⁷ An example of the social table for the first census benchmark year in 1901 can be found in Table A2.2 of the Appendix.

²⁸ Like in Germany income for “unoccupied” is assumed to be equal to domestic servants. When testing the inclusion of 0 income in the “unoccupied” group, this affect Gini levels by 0.06 while does not affect inequality trends.

wage earnings- obtained from the Board of Trade (1908), and Routh (1965) and applied to the corresponding wage-earnings series (shown in Table A3.6). From 1920 to 1938 we used data from Chapman (1952) and Feinstein (1972) on salary earnings at different branches. From 1938 to 1950 we used the skill premiums obtained from Feinstein (1972) and the *Census of Production*. For some branches or periods information on skill premiums are only available at certain benchmark years. In those cases, skill premiums have been interpolated. Additionally, female earnings have been estimated from the gender ratios - female earnings as a percentage of male earnings- obtained from Routh (1965) and Lewis (1984) (as detailed in Table A3.8 of the Appendix).²⁹ Here, as for skills premiums, gender ratios have been interpolated to smooth trends between available benchmark years.

Finally, annual incomes for owners in agriculture and industry are based on Feinstein (1972, table 23), who provides annual total income from self-employment, distinguishing between farmer's income (including rents) and non-farm incomes (including gross trading profits of companies) and also the number of self-employed and owners in the two respective groups at some benchmark years (1901, 1911, 1921, 1938). In this way, we can estimate the average income per owner in agriculture and industry in the benchmark years. For the years in between we applied interpolation methods. From 1939 to 1950 we have used forward projections based on the evolution of total income from self-employment in Feinstein (1972, table 10).

Sample adjustments

Even though the British and German occupational censuses are comparable in terms of sector structure and work categories, they have some compositional differences that need to be addressed to make both samples comparable.

On the one hand, there is evidence that during the early twentieth century the British censuses tend to under-report paid work carried out by married women, under the widespread assumption that they were housewives (Crafts, Gazeley, and Newell 2007, 2-3, Roberts 1995, 6-13). According to Hakim (2004, 61) such under-reporting was due to the wish of working and middle class families to conform to the ideal of a full-time housewife supported by a husband with a "family wage". Consequently, and different from Germany, we observe a large proportion of "unoccupied" people in the British statistics that remains

²⁹ An example on these calculations at particular benchmark years can be found in Figure A3.2 of the Appendix.

around 43 per cent until 1950, of which 56 per cent were married females. In the German statistics, instead, the “unoccupied” group was less than 20 per cent of the total active population with more evenly distributed rates between males and females.³⁰ Consequently, we have adjusted our British sample by leaving out the unoccupied married females (60 per cent of total unoccupied females and 20 per cent of the total active population). In that way, we obtain a more comparable sample to that of Germany and avoid the double counting derived from the inclusion of women who actually lived on a family wage.³¹

On the other hand, the German censuses tend to over-record women at work. According to Mason (1976, 78) the German censuses, unlike the British ones, included family workers or assistants, even though they had no labour contract, no insurance, and often worked for irregular periods of time without a regular wage. These women usually worked on farms, in shops or cafés owned by their husbands or other male relatives. Therefore, to make both samples comparable and to avoid double counting, we have adjusted our German sample by leaving out female family workers (around 30 per cent of total females and 10 per cent of total active population).³²

Final samples structure

After these adjustments, the samples represent 50 per cent (SD=7.3) of total population in Germany and 60 per cent (SD=1.8) of total population in Britain. They have similar proportions of the male and female labour force (70 and 30 per cent respectively), but somewhat higher ratios of unoccupied females in Britain (65 against 55 per cent).³³ Sectoral structures also differ, as expected: Germany had a higher proportion of the occupied population in the agricultural sector (accounting on average for 23 per cent of the total labour force) than Britain (where it remains below 10 per cent); the German proportion was lower in services (27 against 40 per cent); proportions were similar in industry (around 50

³⁰ To estimate a possible under-recording of unemployed people in Germany, especially in 1933, we have also tested the increase of the number of “unoccupied” by adding 2 million of “invisible unemployed” (Rahmer 1933). This 2 million was previously subtracted from sectors more likely to be affected by seasonality as follows: 1 million from workers in agriculture (50 per cent male and female); 500,000 from male workers in building; 500,000 from female workers in domestic services. Results do not show significant changes in original inequality levels, neither in trends.

³¹ We assume that unoccupied single or widowed females had lower incomes than unoccupied married women. Of course, there might be other factors lowering per capita incomes of unoccupied married females -such as the family size- however these cannot be inferred from the available sources.

³² We have tested measuring inequality with the original samples. In both cases this results in higher inequality levels (since we are including more females, who tend to have the lowest income). However, we do not observe changes in inequality trends. See Figure A1.1 in the Appendix

³³ See Table A2.3 in the Appendix.

per cent).³⁴ However, when we observed the potential effect of changes in the sectoral structure on inequality levels, we found that these must have been small. For instance, in Germany, average earnings in the service sector were higher than in industry, but the proportions of the total labour force in both sectors remained fairly stable over the period.³⁵ In Britain the earning levels in both sectors were quite similar, diminishing the potential impact of a transfer of labour from industry to services or vice versa.³⁶

Compared to Germany, Britain had lower proportions of owners and salaried workers, which together accounted for 15 per cent of the total active population versus 30 per cent in Germany.³⁷ Differences in weights of salaried workers are due to the different inclusion of border-line categories (occupations which could be treated either as salary or wage-earners) in the service sector. For instance, according to the German censuses, the occupational groups of public administration, trade and finance mainly consist of salaried workers, who represent around 80 per cent of total workers. In the British case, salaried workers in those occupational groups only represent 30 per cent on average. This is because we have included certain border-line categories (such as policemen, firemen and shop assistants) in the group of wage earners to make it consistent with the group definitions (so with wage-earnings estimations) in Feinstein (1972).

Different work status shares determine inequality levels in both countries, but relative group sizes and weights remain fairly constant (see table A2.4 in the appendix). We find that inequality trends will be mostly driven by changes in relative earnings. Mean earnings in the two sectors of industry and services in Britain remained quite close at different levels of work status, while in Germany, workers in the services sector were better remunerated than those in industry, particularly the salaried ones (see Appendix Figure A1.6 and Figure A1.7). At first glance, this would suggest lower inequality values and more constant inequality trends among British workers than among their counterparts in Germany. Yet in addition to ascertaining the dispersion of earnings within the workers groups, differences between property and labour incomes also need to be considered. Since our dynamic social tables include data on owners and workers (by work status and gender),

³⁴ See Figures A1.2 and A1.3 in the Appendix.

³⁵ See Figures A1.2 and A1.4 in the Appendix.

³⁶ See Figures A1.3 and A1.5 in the Appendix.

³⁷ These figures correspond to the average weights of salaried workers and owners over the entire active population (including unoccupied people). See Table A2.4 in the Appendix.

we can obtain inequality estimates that capture both inequalities between and within groups together. Results are shown and discussed in the next section.

4. Inequality in Germany and Britain, 1900-1950

Figure 2 shows direct estimates of inequality (measured as Gini coefficients) obtained from the dynamic social tables of Germany and Britain.³⁸ Looking first at the levels, Britain registers in general higher income inequality than Germany (except for the periods 1914-1920 and 1941-1950). Inequality levels in Germany were much more volatile, with Ginis ranging between 30 and 52 (SD=5.7), than in Britain, with ranges between 35 and 44 (SD=2.4).³⁹ Comparing the trends over time in both countries, parallel and smooth paths appear before WWI, but opposite trends prevail afterwards.⁴⁰ During WWI, income inequality increased dramatically in Germany (from 40 to 52), but it declined sharply in Britain (from 44 to 36). During the post-war recession years, trends reversed with increasing inequality (by 7 percentage Gini points) in Britain and a pronounced drop in Germany (from 52 to 30). A new reversal took place between the Great Depression and the post-WWII years, when inequality increased rapidly in Germany (up to 44) and declined in Britain (by 4 percentage Gini points).

Given the results presented in Figure 2, we argue that the alleged drop in inequality in Europe over the twentieth century was neither continuous nor similar across countries. The data clearly show that income inequality increased rapidly in Germany during the WWI and the Nazi period, while in Britain an increase took place during the interwar years, after a sharp drop in the WWI period.

³⁸ The Gini coefficients from the social tables are estimated in the conventional way:

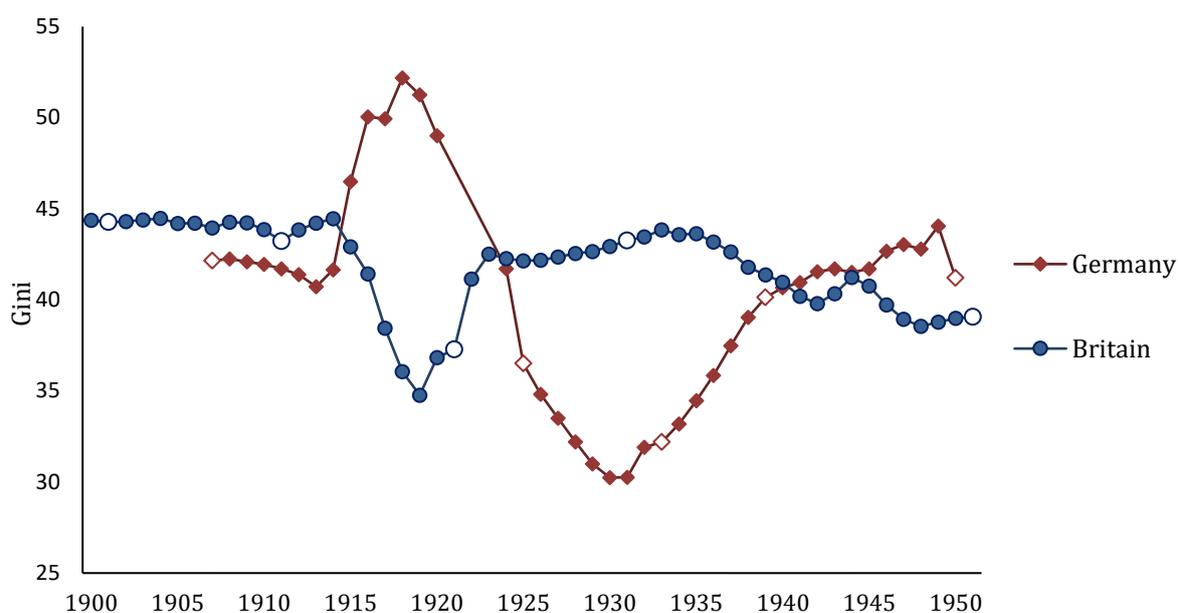
$$G = \frac{1}{\mu} \sum_{i < j}^n p_i p_j (y_j - y_i)$$

Where n = is the number of social classes; μ = is the overall mean income, p_i = the proportion of people belonging to i -th social class; and y_i = the mean income of people belonging to i -th social class which are ranked in ascending order ($y_j > y_i$). As described in Section 4 we have in 78 classes for both Germany and Britain.

³⁹ Gini coefficients are expressed in percentages ranging from 0 (perfect equality) to 100 (perfect inequality).

⁴⁰ We have estimated inequality from alternative generalised entropy indices (i.e. Theil index). Inequality trends in both countries coincide with those derived from Gini coefficients. Results are available from the authors upon request.

Figure 2. Inequality trends in Britain and Germany (Gini coefficients)



Sources: See text.

Notes: Markers in white indicate census benchmark years from which we have interpolated the active population structure. Data on earnings are on an annual basis, only interrupted between 1920 and 1924 in Germany and in 1939 in Britain.

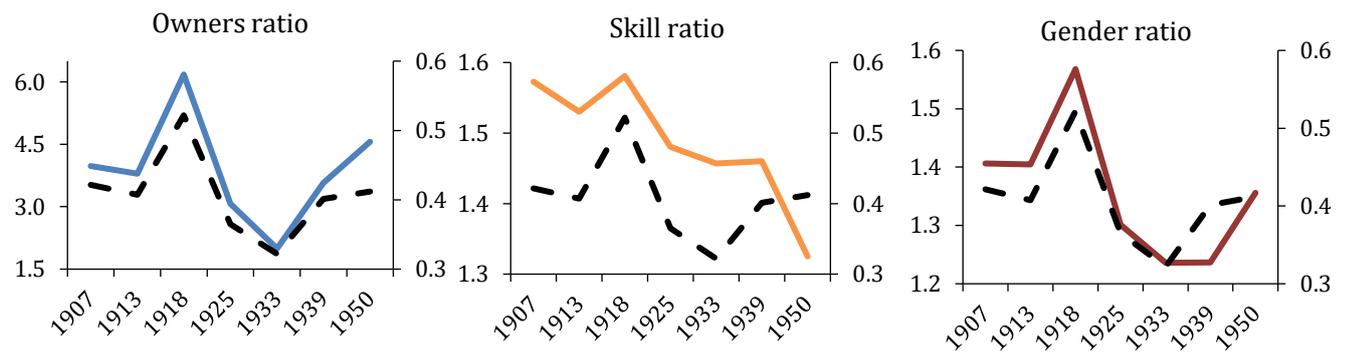
We observe that the increase in inequality during WWI and the Nazi period in Germany and the long-term decline in Britain is in line with inferences on inequality from Piketty and co-authors based on the evolution of the top income shares in Germany and the United Kingdom (see Figures A1.8 and A1.9 in the Appendix). However, our trends in inequality present much more precision that is not registered by the evolution of the top income shares. This is because the evolution of the top income shares over national income can only proxy inequalities between those receiving income from property (the upper part of the distribution) and those receiving income from labour. But our dynamic social tables also capture inequality linked to the dispersion of labour earnings. Both dimensions are necessary to draw reliable long-run trends in income distribution, so they should be considered jointly (Prados de la Escosura 2008, 290). Furthermore, dynamic social tables allow us to develop alternative analyses that disentangle the different forces of inequality in these two countries, in particular the differences between proprietors and workers and the dispersion in labour earnings.

Figure 3 shows the evolution of different ‘inequality forces’ that help us to obtain a broader understanding of inequality changes in Germany and Britain. The first mechanism, the owners ratio, is defined as the ratio between the earnings of owners and the earnings of all workers (including salaried and wage earners). This indicator captures to what extent

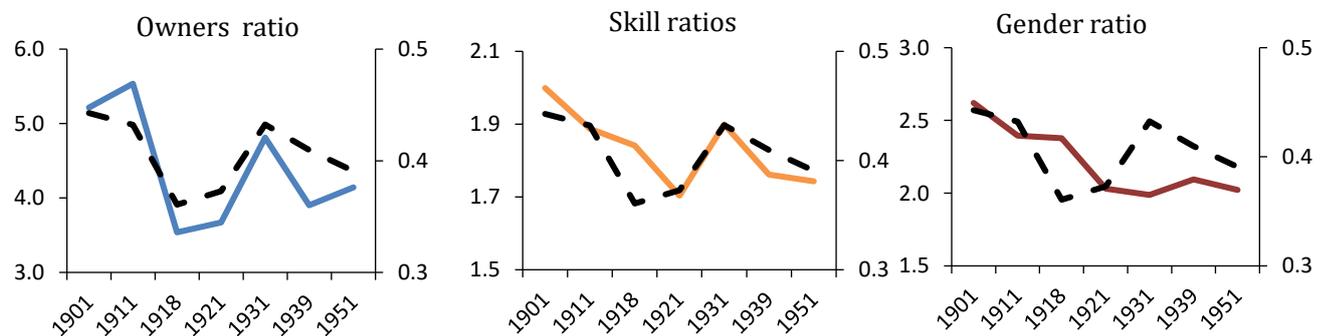
the income of the highest part of the distribution is diverging from the rest, denoting changes in inequality between proprietors and workers. Next, the skill ratio is defined as the ratio between earnings of salaried workers and earnings of wage workers and reports income differentials by work status. To the extent that the increase in skill ratio signals increasing differences within the group of workers, its increase also contributes to the increase in inequality.⁴¹ The last force, the gender ratio, is defined as the ratio between male and female earnings. This ratio indicates gender pay inequality and its increase also contributes to rising inequalities within the group of workers, thus to a rise in overall inequality. A careful study of the evolution of these ratios (solid lines represented at left y-axes) together with the evolution of Gini coefficients (dashed lines represented at right y-axes) helps us to understand inequality changes within the two countries.

Figure 3. Trends in ‘inequality forces’ in Germany and Britain, 1900-1950

GERMANY



BRITAIN



Sources: Dynamic social tables described in Section 3

Notes: Final ratios are computed as the average of the ratios in the three main sectors (agriculture, industry and services) at particular benchmark years. Selected years correspond to censuses benchmark years in each

⁴¹ The rise in the skill ratio does not necessarily have to imply an increase in inequality as far as the proportion of salaried workers within the labour is increasing. However, as shown in Table A2.4 in the Appendix, proportions of salaried workers in Germany and Britain did not show significant increases until 1939.

country. Moreover, estimations at non-census years in Germany (1913, 1918) have been added to observe inequality changes during the WWI. Similarly, for Britain we have added a non-census benchmark year estimations in 1918 and 1939.

Before WWI, Germany shows a mild decrease in inequality linked to the decrease in the owner and skill ratios. In Britain, stable trends in inequality appear to be associated with the drop in work status and gender inequalities, which offset the increase in the owners ratio. This process of equalization continued in Britain until the end of WWI, but it was disrupted in Germany.

During WWI, the Gini coefficient in Germany increased from 40 to 52 and it is associated with an increase in the owners ratio, with proprietors earning on average up to 6 times more than workers. Gender and skill differences also grew during the conflict with earnings of salaried employees being a factor 1.6 higher than those of wage-earners and with males earning 1.6 times more than their female counterparts. The opposite is observed in Britain, where at the end of the Great War the Gini coefficient was 8 percentage points lower compared with the situation before the start of the conflict, due to a dramatic fall in the owners ratio and the reduction in skill and gender inequalities. At the end of the war, however, both skill and gender ratios remained higher than in Germany. British proprietors now received on average 3.5 times more than workers compared to 5.5 in 1911. This is in line with the literature that points to the lesser power of British owners to make profits from the war vis-à-vis their German counterparts (Turner 1984, 33-4, Winter 1988a, 170).⁴² Moreover, the reduction in pay inequalities in Britain corresponds with the emergence of national pay bargaining across British industry and the improvement in the position of unskilled workers during WWI (Crafts, Gazeley, and Newell 2007, 55, Hart and MacKay 1975, 38, Reid 1988, 228, Routh 1965, 132). In Germany, the extension of collective bargaining agreements only started after the revolution of 1918 (Bresciani-Turroni 1937, 301, Bry 1960, 41, Feldman 1997, 107).

Trends reversed between the end of WWI and the Great Depression. In Germany, the owners ratio fell from 6.2 in 1918 to 1.6 in 1933, due to the loss of rents during the hyperinflation years and the Great Depression (Balderston 1982, 500, Dell 2007, 413). Together with the narrowing skill and gender differences this resulted in a decrease in inequality of more than 20 Gini percentage points. Wage compression manifested itself in

⁴² A similar conclusion is obtained by Procopovitch (1926, 75) who states that “before the war the incomes of the wealthiest few in England were somewhat higher than in Germany, but whilst in Germany they have increased considerably during the war, in England [...] they have declined”.

the second half of WWI and in 1919 as a result of a demand for a more egalitarian income distribution, a fast unionisation of unskilled labour and the extension of the system of collective agreements (Bry 1960, 88, Holtfrerich 1986, 234). A decrease in gender differences, in turn, seems to be related to the decline of female workers in domestic services, which accounted for 47 per cent of total female workers in services in 1918 and 'only' 40 per cent in 1931.

During the interwar recession inequality increased in Britain by 7 percentage points, returning to pre-war inequality levels. The rise occurred in a context of an increasing owners ratio, when employers claimed back what they had lost during the war (Reid 1988, 230) and resisted control of wages as trade unions weakened (Thane 2007, 186). Indeed, reducing wages was conceived as the only way to reduce production costs as a part of deflationary policies to restore the gold standard (Eichengreen and Temin 2000, 192). Moreover, skill ratios increased due to the major downward drift of manual workers earnings (Routh 1965, 132), as unemployment was much greater among the unskilled (Turner 1952, 228) and wages more affected by cyclical fluctuations than salaries (Routh 1965, 124-132).

From the Great Depression until the end of WWII, inequality in Germany tended to increase, although it did not reach the levels that were attained in WWI. We observe that between the census benchmark years of 1933 – coinciding with the rise of Nazi Germany - and 1939, the rise in inequality took place in a context of an increasing owners ratio and the stagnation of the skill and gender ratios. This is a reflection of the soaring profits linked to rearmament policies (Dell 2007, 416), together with the tighter regulation and lower bargaining power of labour unions (Bry 1960, 45, James 1986, 367). In Britain, a slight decrease in inequality between the Great Depression and WWII was driven by a fall in the owner's income and skill ratios, within a context of increasing average earnings across sectors and work status (Knowles and Roberston 1951, 111).⁴³

In the trans-WWII period, from 1939 to 1950, Germany experienced a slight increase in inequality relative to the previous period. The increase in the owners and gender ratios was partially offset by the fall in skill ratios. This was apparently associated with the shrinking earnings advantages in the service sector (Hohls 1995, 51), in particular for salaried workers.⁴⁴ Similarly, in Britain, despite the increase in the owners ratio and the stagnation of gender inequalities, the fall in inequality can be partially linked to the increase

⁴³ See Figures A1.5 and A1.7 in the Appendix.

⁴⁴ See Figure A1.6 in the Appendix.

in money earnings for all classes, the increasing number of workers in relatively high wage industries and the levelling of earnings across work status and gender (Gazeley 2006, 178, Turner 1952, 227).

In summary, before 1933 and after 1939, variations in the relationship between property and labour incomes as well as variations in labour earnings drove inequality changes in Germany. Between 1933 and 1939, differences between owners and labour earnings led to changes in the income distribution. In Britain, earnings dispersion among workers appears as the main driver of inequality changes before WWI and after 1939. However, from WWI to the outbreak of WWII differences between proprietors and workers as well as changes in earnings dispersion caused inequality variations.

5. Income growth distribution in Germany and Britain, 1900-1950

How did inequality develop for specific groups during particular sub-periods? To obtain a broader understanding of the effect of inequality movements on segments of the workforce we have estimated so-called growth incidence curves (GICs). The GICs, introduced by Ravallion and Chen (2003), display the growth rates in average money incomes for particular percentiles of the distribution between two benchmark years. In this sense, GICs show us how periods of economic expansion or economic downturn affect different parts of the distribution. An upward trend indicates that the highest part of the distribution benefited relatively more during a specific period, suggesting an increase in inequality. A downward trend would suggest the reverse.

Given the lack of historical data on income distribution, GICs are usually calculated for modern periods when individual data from household surveys are available. Interestingly, dynamic social tables also permit the estimation of historical GICs, as they offer an acceptable level of disaggregation.⁴⁵ Figure 4 shows GICs for Germany and Britain between 1900 and 1950. Y-axes show the average accumulated growth of money incomes (expressed in percentages) at different fractiles of the respective national income distributions (drawn on the X-axes) between benchmark years. Besides analysing the total period, we distinguish between five different sub-periods. The first is from the first census year in the respective countries to the year before WWI. The second is from 1913 to the end of the conflict. The third is from 1918 to the Great Depression. The fourth is from 1929 to

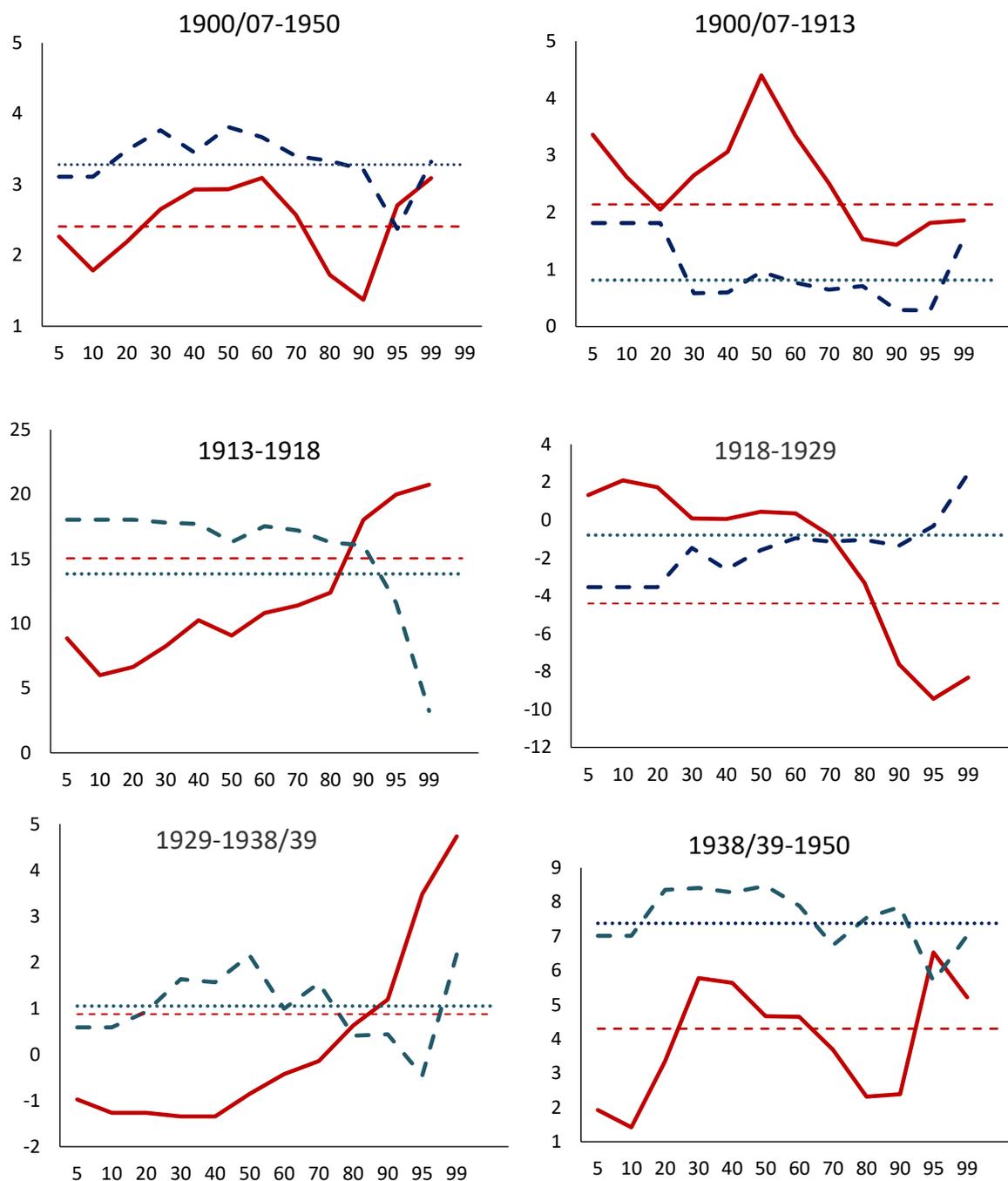
⁴⁵ The first application of GICs to historical data was also made using dynamic social tables (see Gómez-León 2016)

the outbreak of WWII, and the last covers the period from 1939 to 1950. Solid lines in red represent GICs in Germany, the dashed blue lines refer to Britain. Additionally, flat lines with dashes and dots respectively show average growth rates on money incomes in Germany and Britain. That way we can observe how parts of the distribution performed compared to the average.

Although we cannot follow individual occupations throughout time, we observe that, in general, occupational groups placed at particular fractiles of the distribution remain in place at benchmark years.⁴⁶ According to the occupational classification by fractiles, we distinguish 5 different classes: a “low” class (the bottom 20 per cent) formed by wage-earners in agriculture and domestic services; an “upper-low” (from P20 to P50) mainly formed by female wage-earners in industry and services as well as salaried females and male wage-earners in manufacturing industries (paper, textile, food...); a “lower-middle” class (P50-P70) with female wage earners in transport, public administration and professions as well as salaried females and male wage-earners in war-related heavy industries (metal, chemicals...) and services; the “higher-middle” group (P70-90) is formed by salaried males in war-related industries as well as salaried males and females together with male wage-earners in transport, public administration and professions; finally a “top-income” class (the upper 10 per cent) is formed by owners in agriculture as well as proprietors in industry and trade.

⁴⁶ It is worth noting that these are anonymous GICS, so in theory we are not able to capture social mobility derived from the fact that, for example, an individual at the bottom 5 per cent moves to the upper fractile at the end of the period. What we are capturing instead is the income growth at different fractiles of the distribution. However, when looking at occupations (by work status and gender) belonging to different fractiles we observe that in general the ranking remains.

Figure 4. Growth incidence curves in Germany and Britain, 1900-1950



Sources: See text

Notes: Y-axes show the average accumulated growth on money incomes (expressed in %) at different fractiles of the distribution (drawn in X-axes) between two benchmark years.

GICs in solid red lines correspond to Germany, those in dash blue to Britain. Flat lines with dashes and dots correspond respectively to average growth rates on money incomes in Germany and Britain.

Taking the period as a whole, we see that in the case of Germany those groups moving above the average and thus benefiting more from overall growth were the upper-low and the middle-low classes together with the top 10 per cent. Lower gains were registered among the bottom 20 per cent and the high-middle classes. Britain registered higher growth rates on average than Germany, which went to the upper-low and middle classes to the detriment of the lowest and highest classes. In this sense, we could say that in both countries the major winners –in money income terms- of the total economic expansion experienced between 1900 and 1950 were the upper-low and lower-middle classes.

When looking at different periods, we observe that in Germany before WWI those who benefited more from growth were the upper-low and lower-middle classes due to the increasing earnings for both male and female workers in industry. Here the highest gains for the upper-low class seem linked to a clear tendency towards equalization in the sectoral wage structure, as already detected by Hoffmann (1965, 468-95) and Hohls (1995, 45). Britain experienced lower income growth rates with the highest gains at the bottom 20 per cent linked to the rise in the remuneration of domestic servants as a market response to increasing demand and diminishing supply (Feinstein 1990, 614).

As with inequality trends, opposite GICs appear during WWI. Both countries exhibited similar average money income growth rates (around 14 per cent) but with contrasting distributions. In Germany incomes of middle-high and top-income classes grew above the average to the detriment of the bottom 80 per cent. The highest gains in these particular parts of the distribution seem to be the result of three factors: first, the expansion of the war-related heavy industries and the widening differences with respect to manufacturing industries (Bry 1960, 195, Hohls 1995, 54, Holtfrerich 1986, 236, Kocka 1984, 35); second, higher skill premiums and gender ratios linked to a higher and almost exclusive participation of skilled (male) labour unions in the bargaining processes (Kocka 1984, 111, Reid 1988, 227); finally, the enormous growth of business profits in the war industries (Bresciani-Turroni 1937, 28, Holtfrerich 1986, 229). Unlike Britain, excess of profits were subjected to mild taxation (Balderston 1989, 230, Ferguson 1999, Kocka 1984, 23). In this sense, the lowest gains (below the average) for the upper 20 per cent in Britain seem to be the result of the industrialists' subservience to the Government's control of profits (Winter and Prost 2005, 118, Winter 1988b, 170, Wrigley 1976, 112). The relatively higher gains within the bottom 80 per cent groups can be related to the sustained rise of average annual earnings of both wage and salary earnings including females (Aldcroft 1970,

354; Gazeley 2007,354). This went along with narrowing differences between these groups in a context of an accelerating trend toward national pay bargaining (Coates and Topham 1980, 160, Crafts, Gazeley, and Newell 2007, 55).

Between the end of the conflict and the Great Depression, both countries exhibited negative average income growth rates, Germany being more affected than Britain. In Germany, the top-income and middle-high classes appear as the most heavily affected during the interwar recession years, while those in the bottom and middle classes performed somewhat better. Modest but positive gains at the low and middle parts of the distribution during the Weimar Republic seem to be the result of the higher bargaining power of labour unions (now embracing unskilled workers and women) vis-à-vis employers in collective labour agreements where Government arbitration usually tipped in favour of labour unions (Balderston 1982, 500, Ferguson 1996, 108, Fisher and Hornstein 2002, 108, Holtfrerich 1986, 222, Ritschl and Straumann 2010, 172). The fall in business profits might be due to the increasing labour costs and the loss of rents in the years of hyperinflation (Balderston 1982, 500, Holtfrerich 1986, 270), as well as the economic chaos during the French occupation of the Rhineland (where most heavy industry was located) and the Great Depression (Dell 2007, 416-7). In Britain, however, those less hit by the economic downturn, exhibiting low but positive growth rates, were the top 5 per cent, including proprietors in industry and trade, to the detriment of the bottom 90 per cent. This occurred in a context of increasing unemployment, the weakening bargaining position of trade unions, and the downward flexibility of wages in accordance with the gold standard's dictates (Broadberry 1986, 472, Eichengreen and Temin 2000, 192, Feinstein, Temin, and Toniolo 2008, 40).⁴⁷

From 1929 to the outbreak of WWII, Germany and Britain present moderate average growth rates between 0 and 1 per cent. In Germany, however, the highest 10 per cent attained income growth rates above the average (up to 5 per cent) to the detriment of the 90 per cent which exhibited zero or negative growth rates. During this period, the benefits linked to rearmament went to the upper class of proprietors and major gains were also received by those in public administration. The scope for improvement among low and middle-classes was almost inexistent due to the deflationary policies introduced by

⁴⁷ According to Feldman (1997, 211) "firmly and established democracies [such as those of Great Britain and the US] could withstand the shocks of deflationary economic policy without suffering serious political consequences. To this respect, Eichengreen and Temin (2000, 193) pointed out that "wage reductions were a bone of contention in other countries [and] German wages appeared to be higher than before in the war. More importantly they were less flexible than in the golden age before the first world war due to changes in labour market institutions".

Chancellor Brüning from 1931 (Feinstein, Temin, and Toniolo 2008, 90, Galofré-Vilà et al. 2017, Temin 1991, 62-3), and then to the dissolution of labour unions and the setting of maximum wages when Hitler assumed power (Bry 1960, 233-54, Fisher and Hornstein 2002, 108). In Britain benefits appear to be more evenly distributed between the upper class of proprietors and low-middle classes formed by salaried and wage-earners in industry. In this respect, there is evidence that despite the high pools of unemployment, both institutional changes and labour demand effects resulted in a lower fall in wages in Britain, as well as the reduction of pay inequalities, especially in those industries crucial for the rearmament and war effort (Aldcroft 1970, 356, Gazeley 2006, 175).

Finally, between 1939 and 1950, both countries exhibited high average income growth rates (7 and 4 per cent respectively), but gains were more equally distributed in Britain than in Germany. In Germany, lower gains registered at the bottom 20 per cent and p70-p90 seem to be the reflection of the discouraging of female work (Mason 1976, 87, Ritschl and Straumann 2010, 173), as well as the diminishing advantages of the service sector (Hohls 1995, 51) in favour of industry, where both workers' (especially wage-earners) and proprietors' incomes grew above the average. In Britain all workers seemed to benefit equally from growth in a context of increasing earnings for all classes, together with the reduction of skill premiums and gender pay inequalities (Gazeley 2006, 197, Haddy and Currell 1958, 108). In this vein, Gazeley (2006, 197) argued that "the existence of a policy of 'fair shares for all' in Britain coinciding with the period of maximum war effort which for women workers in particular represented a period of greater pay equality."

In summary, we observe that benefits linked to industrial expansionism during WWI and WWII were concentrated in the upper classes in Germany, while in Britain benefits were more evenly distributed among the working classes. The opposite happened during the interwar period. Results appear to be linked to the changes in the power of labour unions. During the two World Wars, British workers seemed to have had more powerful labour unions than their German counterparts, especially during the Nazi period when German labour unions were abolished. During the interwar depression, however, reinforced labour unions in Germany (after 1918) managed to obtain nominal wage increases that made up for real wage losses experienced during the hyperinflation, while higher incomes were severely affected due to increasing labour costs and loss of rents. In Britain, deflationary policies during the post-war recession seem to have had the opposite effect, with high levels of

employment and slumping prices reducing the bargaining position of trade unions (especially after the 1926 defeat) when negotiating nominal wage increases.

6. Concluding remarks

In this paper, we aimed to contribute to the literature with the provision of annual data on income inequality in Britain and Germany during the first half of the twentieth century. We proceeded to identify the forces that explain inequality changes in these two countries, exploring the whole range of the distribution. These aims are motivated by the idea of an egalitarian decrease in inequality across European countries during this period, based either on scattered years or on fragmentary results drawn from isolated parts of the distribution. With respect to our first aim, we obtained direct estimates on inequality for Germany and Britain on an annual basis by using (for the first time) dynamic social tables. Clashing with the idea of a Great Leveling in Europe during the twentieth century (Lindert and Williamson 1985; Milanovic 2016; van Zanden et al. 2014), evidence from Britain and Germany suggest that the drop in inequality was neither steady nor similar across European countries. Britain and Germany's respective Gini coefficients show contrasting trends that are, however, in line with the idea of the inequality cycles proposed by Milanovic (2016) and revealed for the case of Spain (Prados de la Escosura 2008). The fall of inequality in Germany was interrupted during WWI and the Nazi period, while in Britain the reversal occurred between the end of WWI and the Great Depression. The long-term evolution of inequality in Germany and Britain is not dissimilar to that presented by Piketty and their associates based on the evolution of top incomes shares in Germany and the United Kingdom. However, our results suggest further changes in inequality, because with dynamic social tables we capture in tandem the differences between owners and workers and the dispersion in labour earnings.

With respect to our second aim, detailed dynamic social tables allow us to identify the forces behind inequality changes as well as income growth rates along different parts of the distribution. Results suggest that before 1933 and from 1939 onwards both variations in the relationship between property and labour incomes as well as variations in labour earnings drove inequality changes in Germany. During the Nazi government only differences between owners and labour earnings determined changes in inequality as the abolition of trade unions and the setting of maximum wages precluded the dispersion of labour earnings. In Britain, earnings dispersion among workers appears as the main driver of inequality changes before WWI and after 1939, when the reduction of skill premiums and gender pay

inequalities offset the increase in the owners' ratio. However, from WWI to the outbreak of WWII both differences between proprietors and workers as well as changes in labour earnings dispersion caused inequality variations.

Our conjectures point at primarily political and institutional factors as crucial drivers of inequality trends over the first half of the twentieth century. During the two World Wars benefits linked to industrial expansionism were concentrated in the upper classes in Germany, while in Britain benefits were more evenly distributed among middle and lower classes, probably due to the higher power of British labour unions. During the interwar period, high unemployment and deflationary policies seem to have severely weakened the power of labour unions in Britain. In Germany, however, labour unions frequently supported by government arbitration increased their bargaining power during the hyperinflation years and after.

We believe that the reconstruction of dynamic social tables reveals a rich picture of the evolution of income inequality in Europe by providing annual data that cover the whole range of the distribution, rather than patchy pictures focused on fragmentary parts of the population only. This way we are able to get a deeper understanding of the potential drivers of relative income movements in the period 1900-1950.

References

- A'Hearn, Brian, Nicola Amendola, and Giovanni Vecchi. 2016. On Historical Household Budgets. In *HHB Working paper series*. Rome.
- Aldcroft, Derek H. 1970. *The Inter-War Economy: Britain, 1919-1939*. Vol. 1. New York: Columbia University Press.
- Alfani, Guido. 2015. "Economic inequality in northwestern Italy: a long-term view (fourteenth to eighteenth centuries)." *The Journal of Economic History* no. 75 (04):1058-1096.
- Allen, Robert C. 2016. Revising England's Social Tables Once Again. In *Discussion Papers in Economic and Social History*. Oxford: University of Oxford.
- Atkinson, A.B., and T. Piketty. 2007. *Top Incomes Over the Twentieth Century: A Contrast Between Continental European and English-Speaking Countries*. Oxford: Oxford University Press.
- Atkinson, A.B., and T. Piketty. 2010. *Top Incomes: A Global Perspective*. Oxford: Oxford University Press.
- Atkinson, Anthony B. 2007. "The distribution of top incomes in the United Kingdom 1908–2000." In *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries*, edited by A.B. Atkinson and T. Piketty, 82-140. Oxford: Oxford University Press.

- Atkinson, Anthony B, Thomas Piketty, and Emmanuel Saez. 2011. "Top incomes in the long run of history." *Journal of economic literature* no. 49 (1):3-71.
- Balderston, Theo. 1982. "The Origins of Economic Instability in Germany 1924-1930. Market Forces versus Economic Policy." *VSWG: Vierteljahrschrift für Sozial-und Wirtschaftsgeschichte*:488-514.
- Balderston, Theo. 1989. "War finance and inflation in Britain and Germany, 1914 - 1918." *The Economic History Review* no. 42 (2):222-44.
- Barnett, George E. 1936. Two tracts by Gregory King. Baltimore: Johns Hopkins University Press.
- Bértola, Luis, Cecilia Castelnovo, and Henry Willebald. 2008. The distribution of income in Brazil during the first globalization. In *Documentos de Trabajo del Programa de Historia Económica y Social*,. Montevideo: Facultad de Ciencias Sociales, Universidad de la República.
- Board of Trade. 1908. Report of an enquiry by the Board of Trade into working class rents, housing and retail prices, together with the standard rates of wages prevailing in certain occupations in the principal industrial towns of the United Kingdom. London:: HMSO.
- Bourguignon, François, and Christian Morrisson. 2002. "Inequality among world citizens: 1820–1992." *The American Economic Review* no. 92 (4):727-44.
- Bresciani-Turroni, Constantino. 1937. *The Economics of Inflation: A study of currency depreciation in post-war Germany, 1914-1923*. London: G. Allen & Unwin.
- Broadberry, Stephen N. 1986. "Aggregate supply in interwar Britain." *The Economic Journal* no. 96 (382):467-481.
- Broadberry, Stephen N, and Carsten Burhop. 2010. "Real wages and labor productivity in Britain and Germany, 1871–1938: a unified approach to the international comparison of living standards." *The Journal of Economic History* no. 70 (02):400-27.
- Bry, Gerhard. 1960. *Wages in Germany 1871-1945*. Princenton: Princeton University Press.
- Business Statistics Office. 1978. *Historical record of the census of production, 1907 to 1970*. London: H.M.S.O.
- Campbell, Bruce. 2008. "Benchmarking medieval economic development: England, Wales, Scotland, and Ireland, c. 12901." *The Economic History Review* no. 61 (4):896-945.
- Coates, Ken, and Tony Topham. 1980. *Trade unions in Britain*. Nottingham:: Spokesman.
- Crafts, Nicholas FR, Ian Gazeley, and Andrew Newell. 2007. *Work and pay in twentieth-century Britain*. Oxford: Oxford University Press.
- Chapman, Agatha L. 1953. *Wages and Salaries in the United Kingdom, 1920-1938*. Cambridge: Cambridge University Press.
- Dell, Fabien. 2007. "Top incomes in Germany throughout the twentieth century: 1891–1998." In *Top Incomes over the Twentieth Century: A Contrast Between Continental European and English Speaking Countries*, edited by A.B. Atkinson and T. Piketty, 365-425. Oxford: Oxford University Press.
- Eichengreen, Barry, and Peter Temin. 2000. "The Gold Standard and the Great Depression." *Contemporary European History* no. 9 (02):183-207.
- Feinstein, Charles H. 1972. *National income, expenditure and output of the United Kingdom, 1855-1965*. Cambridge: Cambridge University Press.
- Feinstein, Charles H. 1990. "New estimates of average earnings in the United Kingdom, 1880 - 19131." *The Economic History Review* no. 43 (4):595-632.
- Feinstein, Charles H. 1995. "Changes in nominal wages, the cost of living and real wages in the United Kingdom over two centuries, 1780-1990." In *Labour's Reward: Real wages and economic change in 19th-and 20th-century Europe*, 3-36. Aldershot: Edward Elgar.

- Feinstein, Charles H., Peter Temin, and Gianni Toniolo. 2008. *The world economy between the world wars*, Oxford scholarship online. Oxford: Oxford University Press.
- Feldman, Gerald D. 1997. *The Great Disorder: Politics, Economics, and Society in the German Inflation, 1914-1924*. Oxford: Oxford University Press.
- Ferguson, Niall. 1996. "Constraints and room for manoeuvre in the German inflation of the early 1920s." *The Economic History Review* no. 49 (4):635-66.
- Ferguson, Niall. 1999. *The Pity of War: Explaining World War I*. New York: Basic Books.
- Fisher, Jonas DM, and Andreas Hornstein. 2002. "The role of real wages, productivity, and fiscal policy in Germany's Great Depression 1928–1937." *Review of Economic Dynamics* no. 5 (1):100-27.
- Floud, Roderick, Robert Fogel, Bernard Harris, and Sok Chul Hong. 2011. *The changing body : health, nutrition, and human development in the western world since 1700, New approaches to economic and social history*. Cambridge: Cambridge University Press.
- Galofré-Vilà, Gregori , Christopher M. Meissner, Martin McKee, and David Stuckler. 2017. "Austerity and the rise of the Nazi party " *Unpublished work*.
- Gazeley, Ian. 2006. "The levelling of pay in Britain during the Second World War." *European Review of Economic History*:175-204.
- Geisenberger, Siegfried, and Josef H. Müller. 1972. *Die Einkommenstruktur in verschiedenen deutschen Länder, 1874–1914*. Berlin:: Duncker & Humblot.
- Gómez León, María. 2015. The Rise of the Middle Class, Brazil (1839-1950). In *EHES Working papers in Economic History*: European Historical Economic Society.
- Gómez León, María. 2016. *Growth, Inequality and the Rise of the Middle Class, Brazil*, Ph.D diss., Universidad Carlos III, Madrid.
- Grant, Oliver W. 2002. "Does Industrialisation Push Up Inequality?: New Evidence on the Kuznets Curve from Nineteenth Century Prussian Tax Statistics." *Oxford Economic and Social History Working Papers* (48).
- Haddy, Pamela, and Melville E. Currell. 1958. "British Inter-Industrial Earnings Differentials, 1924-55." *The Economic Journal* no. 68 (269):104-11.
- Hakim, Catherine. 2004. *Key issues in women's work: female diversity and the polarisation of women's employment*. London: GlassHouse.
- Hart, Robert A., and D. I. MacKay. 1975. "Engineering Earnings in Britain, 1914--68." *Journal of the Royal Statistical Society* no. 138:32-50.
- Hoffman, Philip T., David S. Jacks, Patricia A. Levin, and Peter H. Lindert. 2002. "Real inequality in Europe since 1500." *The Journal of Economic History* no. 62 (02):322-55.
- Hoffmann, Walthar G. 1965. *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*. Berlin: Springer Verlag.
- Hohls, Rüdiger. 1995. "The sectoral structure of earnings in Germany, 1885-1985." In *Labour's Reward: Real wages and economic change in 19th-and 20th-century Europe.*, edited by P. Scholliers and V. Zamagni, 37-60. Aldershot: Edward Elgar.
- Holtfrerich, Carl-Ludwig. 1986. *The German inflation 1914-1923: causes and effects in international perspective*. Berlin: Walter de Gruyter.
- James, Harold. 1986. *The German slump: politics and economics, 1924-1936*. Oxford: Clarendon Press.
- Knowles, K. G. J. C., and D. J. Roberston. 1951. "Differences between Wages of Skilled and Unskilled workers, 1850-1950." *Bulletin of the Oxford University Institute of Statistics*. no. April:109-27.
- Kocka, Jürgen. 1984. *Facing total war: German society, 1914-1918*. Translated by Barbara Weinberger, *Facing total war: German society, 1914-1918*. Cambridge, M: Harvard University Press.

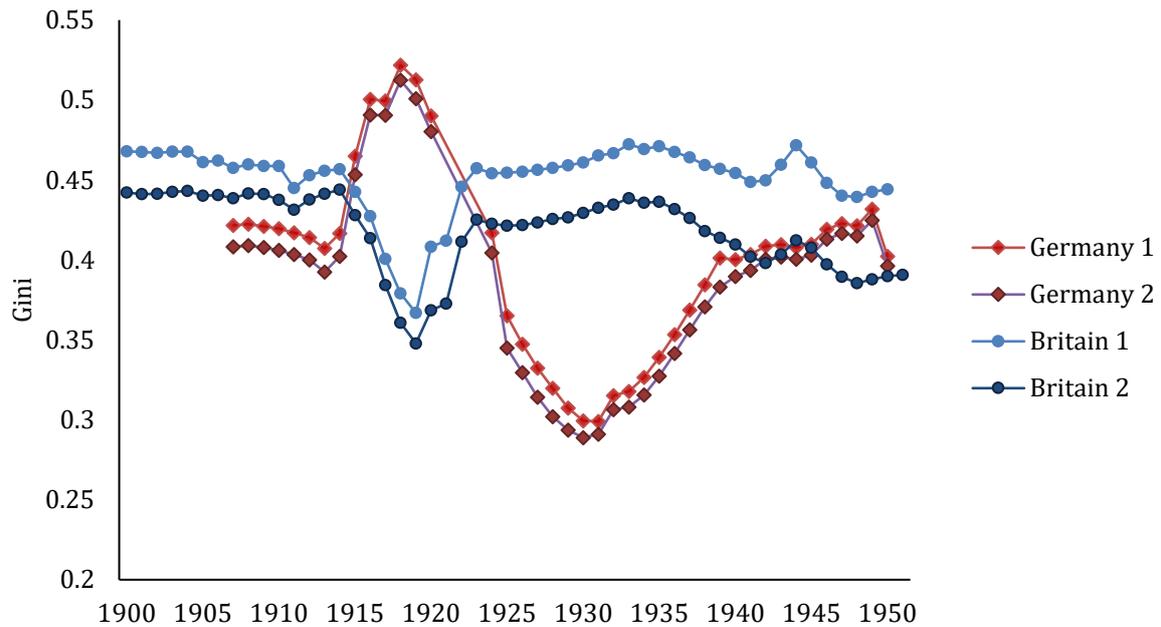
- Kuznets, Simon. 1953. *Shares of Upper Income Groups in Income and Savings*. New York:: NBER.
- Kuznets, Simon. 1955. "Economic growth and income inequality." *The American Economic Review*:1-28.
- Lewis, Jane 1984. *Women in England 1870-1950 : Sexual Divisions and Social Change*. Brighton: Wheatsheaf.
- Lindert, Peter H. 2000. "Three centuries of inequality in Britain and America." In *Handbook of income distribution*, edited by A.B. Atkinson and F. Bourguignon, 167-216.
- Lindert, Peter H, and Jeffrey G Williamson. 1982. "Revising England's social tables 1688–1812." *Explorations in economic history* no. 19 (4):385-408.
- Lindert, Peter H, and Jeffrey G Williamson. 1983. "Reinterpreting Britain's social tables." *Explorations in Economic History*.
- Lindert, Peter H, and Jeffrey G Williamson. 1985. "Growth, equality, and history." *Explorations in Economic History* no. 22 (4):341-377.
- Lindert, Peter H., and Jeffrey G. Williamson. 2016. *Unequal Gains: American Growth and Inequality since 1700*. Princeton: Princeton University Press.
- Maddison, Angus. 1995. *Monitoring the world economy, 1820-1992*. Paris: OECD.
- Mason, Tim. 1976. "Women in Germany, 1925-1940: Family, Welfare and Work. Part I." *History Workshop*:74-113.
- Milanovic, Branko. 2006. "An estimate of average income and inequality in Byzantium around year 1000." *Review of Income and Wealth* no. 52 (3):449-70.
- Milanovic, Branko. 2011. "A short history of global inequality: The past two centuries." *Explorations in Economic History* no. 48 (4):494-506.
- Milanovic, Branko. 2016. *Global Inequality: A New Approach for the Age of Globalization*. Cambridge, MA: Harvard University Press.
- Milanovic, Branko, Peter H. Lindert, and Jeffrey G. Williamson. 2011. "Pre - industrial inequality." *The Economic Journal* no. 121 (551):255-72.
- Morrisson, Christian, and Wayne Snyder. 2000. "The income inequality of France in historical perspective." *European Review of Economic History* no. 4 (1):59-83.
- Piketty, Thomas. 2014. *Capital in the Twenty-First Century*. Cambridge, MA: Harvard University Press.
- Prados de la Escosura, Leandro. 2008. "Inequality, poverty and the Kuznets curve in Spain, 1850–2000." *European Review of Economic History* no. 12 (3):287-324.
- Procopovitch, Sergei N. 1926. "The distribution of national income." *The Economic Journal* no. 36 (141):69-82.
- Rahlf, Thomas. 2016. German Time Series Dataset, 1834-2012. https://figshare.com/articles/German_Time_Series_Dataset_1834_2012/1450809.
- Rahmer, B. A. 1933. Unemployment in Germany, 1932-1933. In *History of Germany*, edited by University of Warwick: Warwick digital collection.
- Ravallion, Martin, and Shaohua Chen. 2003. "Measuring pro-poor growth." *Economics letters* no. 78 (1):93-9.
- Reid, Alastair. 1988. "The Impact of the First World War on British Workers." In *The Upheaval of war: family, work and welfare in Europe, 1914-1918*, edited by R. Wall and J. M. Winter, 221-234. Cambridge:: Cambridge University Press.
- Ritschl, Albrecht, and Tobias Straumann. 2010. "Business cycles and economic policy, 1914-1945." In *The Cambridge Economic History of Modern Europe: 1870 to the Present*, edited by S. Broadberry and K. H. O'Rourke. Cambridge: Cambridge University Press.
- Roberts, Elizabeth. 1995. *Women's work 1840–1940*. Cambridge: Cambridge University Press.

- Rodríguez Weber, Javier E. 2014. "La economía política de la desigualdad de ingreso en Chile: 1850-2009." *Ph.D diss.*
- Routh, Guy. 1965. *Occupation and Pay in Great Britain, 1906-60.* Cambridge: Cambridge University Press.
- Scholliers, Peter. 1989. *Real wages in 19th and 20th century Europe: historical and comparative perspectives.* Oxford: Berg Publishers.
- Söderberg, Johan. 1991. "Wage differentials in Sweden." In *Income Distribution in Historical Perspective*, edited by Yehojachin Simon Brenner, Hartmut Kaelble and Mark Thomas, 76-95. Cambridge University Press.
- Soltow, Lee. 1968. "Long - run Changes in British Income Inequality." *The Economic History Review* no. 21 (1):17-29.
- Staatliche Zentralverwaltung für Statistik. several years. *Statistisches Jahrbuch der Deutschen Demokratischen Republik.* Berlin: Staatliche Zentralverwaltung für Statistik
- Statistisches Bundesamt. several years. *Statistisches Jahrbuch für die Bundesrepublik Deutschland.* Wiesbaden: Statistisches Bundesamt.
- Statistisches Reichsamt several years. *Statistisches Jahrbuch für das Deutsche Reich.* Berlin: Statistisches Reichsamt.
- Temin, P. 1991. *Lessons from the Great Depression:* MIT Press.
- Thane, Pat. 2007. "The 'Welfare state' and the Labour Market." In *Work and Pay in Twentieth-Century Britain*, edited by N. R. Crafts, I. Gazeley and A. Newell. Oxford: Oxford University Press.
- Turner, H. A. 1952. "Trade unions, differentials and the levelling of wages." *The Manchester School* no. 20 (3):227-82.
- Turner, John. 1984. *Businessmen and politics: studies of business activity in British politics, 1900-1945.* London:: Heinemann.
- van Zanden, Jan L. 1999. "Wages and the Standard of Living in Europe, 1500-1800." *European review of economic history* no. 3 (2):175-97.
- van Zanden, Jan Luiten, Joerg Baten, Peter Foldvari, and Bas van Leeuwen. 2014. "The Changing Shape of Global Inequality 1820-2000 Exploring a new dataset." *Review of Income and Wealth* no. 60 (2).
- Williamson, Jeffrey G. 1985. *Did British Capitalism Breed Inequality?* London: Allen & Unwin.
- Williamson, Jeffrey G. 1997. "Globalization and inequality, past and present." *The World Bank Research Observer* no. 12 (2):117-35.
- Winter, Jay. 1988a. "Some Paradoxes of the First World War." *The Upheaval of War: Family, Work and Welfare in Europe, 1914-1918*:9-42.
- Winter, Jay 1988b. "Public Health and the Political Economy of War." *History Workshop Journal* (26):163.
- Winter, Jay, and Antoine Prost. 2005. *The Great War in history: debates and controversies, 1914 to the present.* Cambridge: Cambridge University Press.
- Wrigley, Chris. 1976. *David Lloyd George and the British labour movement: peace and war.* Hassocks: Harvester Press.

Appendix: complementary figures, tables, sources and data.

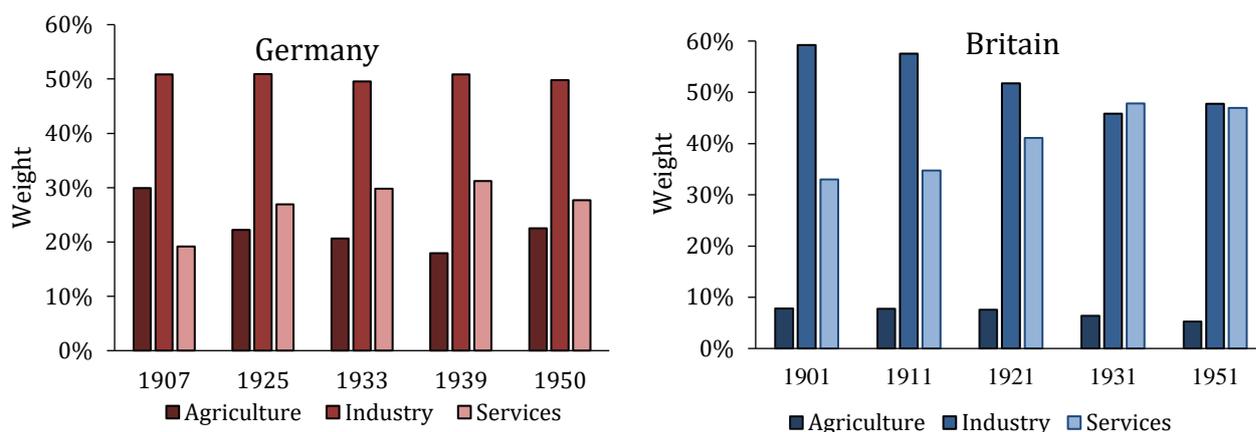
A1. FIGURES

Figure A1.1 Inequality trends (Ginis) in Germany and Britain using different samples.



Notes: Germany 1 includes female family work assistants (around 30% of total females and 10% of total active population). Germany 2 leaves them out. Britain 1 includes all unoccupied females (36% of total active population). Britain 2 excludes married unoccupied females (by 60% of total unoccupied females and 20% of total active population).

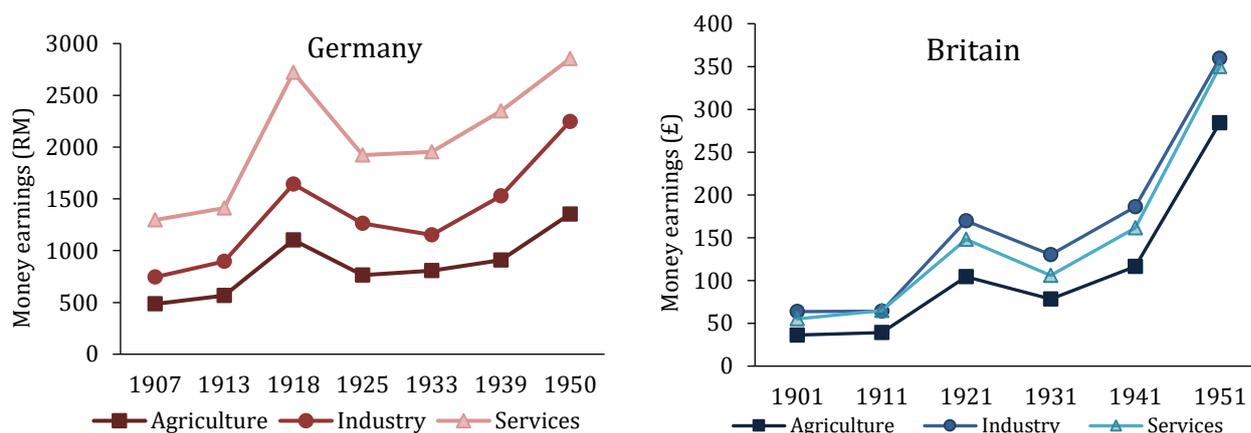
Figures A1.2 and A1.3. Structure of sample by sectors



Sources: See text

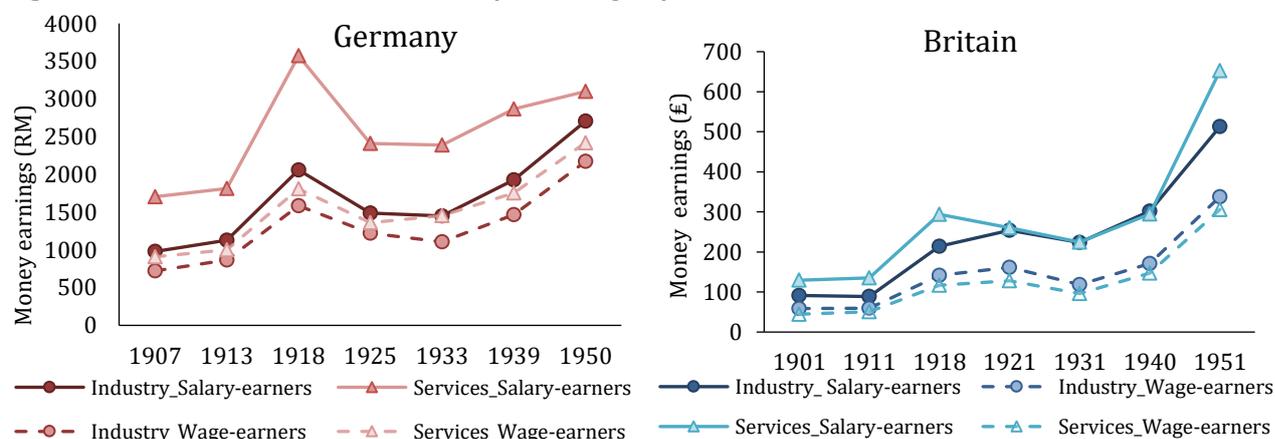
Notes: These figures correspond to the weights of people in the respective sectors over total (without unoccupied). If considering the original sample in Germany (including female family assistants), weights of occupied people in agriculture are by 8% higher.

Figures A1.4 and A1.5. Mean money earnings by sectors



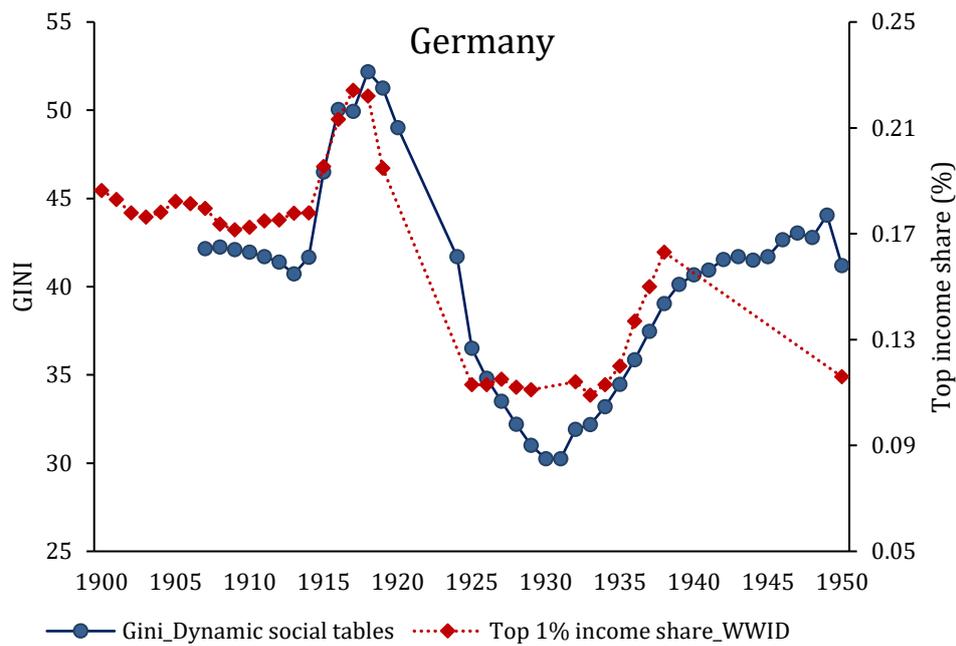
Notes: Although we have annual data on money earnings, we show here selected data points coinciding with census benchmark years in each country and no-census benchmark years relevant for the periods referred to in the main text.

Figures A1.6 and A1.7. Mean money earnings by work status in the two main sectors



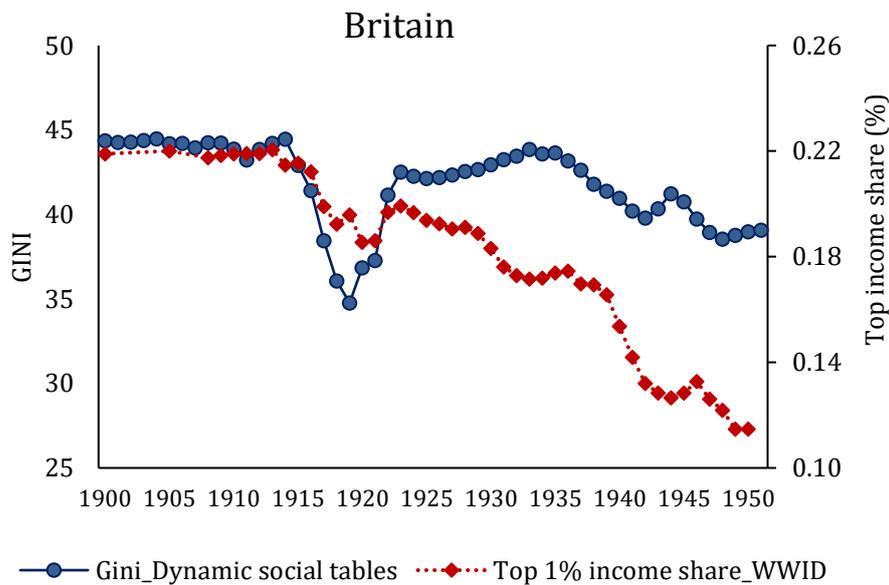
Notes: As for Figures A1.4 and A1.5

Figure A1.8. Evolution of inequality (Ginis) vs. top income shares in Germany



Sources: Ginis have been estimated from social tables (see text). The top 1% income share are from Piketty (2014) available at Table S9.2 of the online appendix <http://piketty.pse.ens.fr/en/capital21c>

Figure A1.9. Evolution of inequality (Ginis) vs. top income shares in Britain



Sources: Ginis have been estimated from social tables (see text). The top 1% income share are from Piketty (2014) available at Table S9.2 of the online appendix <http://piketty.pse.ens.fr/en/capital21c>

A2. TABLES

Table A2.1. Example of social table, Germany in 1907

Social table: Germany (1907)

<i>Occupation</i>	<i>Work status</i>	<i>Gender</i>	<i>Number</i>	<i>Income</i>
<i>Agriculture</i>	salary-earners	male	517096	642
		female	49087	443
	wage-earners	male	3028983	526
		female	1413647	342
<i>Mining</i>	salary-earners	male	55803	1504
		female	369	692
	wage-earners	male	883806	1230
		female	19095	504
<i>Quarrying and earth</i>	salary-earners	male	35639	1504
		female	1121	692
	wage-earners	male	575486	1230
		female	67162	504
<i>Metalworking</i>	salary-earners	male	178761	1130
		female	11302	882
	wage-earners	male	1596051	754
		female	92813	633
<i>Chemical industry</i>	salary-earners	male	23266	1130
		female	2000	882
	wage-earners	male	99146	754
		female	22873	633
<i>Textile industry</i>	salary-earners	male	76662	733
		female	8087	572
	wage-earners	male	390312	533
		female	457588	448
<i>Leather industry</i>	salary-earners	male	15428	1008
		female	1357	786
	wage-earners	male	140611	825
		female	16447	693
<i>Paper industry, printing, arts</i>	salary-earners	male	32994	904
		female	5401	470
	wage-earners	male	260545	603
		female	97071	422
<i>Wood and furniture</i>	salary-earners	male	56025	1000
		female	4019	520
	wage-earners	male	597798	700
		female	38810	490
<i>Food and beverage</i>	salary-earners	male	87229	936
		female	6535	487
	wage-earners	male	568002	624
		female	175819	437
<i>Clothing and cleaning</i>	salary-earners	male	71639	733

		female	26082	572
	wage-earners	male	361299	600
		female	458465	504
<i>Building</i>	salary-earners	male	138610	881
		female	2436	687
	wage-earners	male	1557371	561
		female	11278	471
<i>Insurance and banking</i>	salary-earners	male	42254	1047
		female	3406	723
	wage-earners	male	3698	857
		female	219	557
<i>Transport industry</i>	salary-earners	male	180784	1476
		female	26046	1019
	wage-earners	male	734394	1208
		female	9772	785
<i>Trade</i>	salary-earners	male	319291	961
		female	82543	663
	wage-earners	male	477388	787
		female	101338	511
<i>Catering</i>	salary-earners	male	37002	843
		female	17023	582
	wage-earners	male	139002	690
		female	136134	448
<i>Social services</i>	salary-earners	male	53631	2484
		female	37042	1714
	wage-earners	male	24889	2236
		female	85704	1453
<i>Administration and liberal professions</i>	salary-earners	male	1259239	2070
		female	138240	1428
	wage-earners	male	112460	1863
		female	20874	1211
<i>Domestic services</i>	wage-earners	male	150791	434
		female	314486	434
<i>Without occupation</i>	unknown	male	1612776	434
		female	1792207	434
<i>Owner in agriculture</i>	owners	male & female	2033603	2538
<i>Owner in industry and trade</i>	owners	male & female	2632120	3167

Table A2.2. Example of social table, Britain 1901

Social table: Britain (1901)

<i>Occupation</i>	<i>Work status</i>	<i>Gender</i>	<i>Number</i>	<i>Income</i>
<i>Agriculture and Fishing</i>	salary-earners	male	28387	55
		female	48	27
	wage-earners	male	732818	36
		female	15842	16
<i>Mining, Quarrying</i>	salary-earners	male	13102	112
		female	146	56
	wage-earners	male	766356	87
		female	3854	37
<i>Bricks, Cement, Pottery etc</i>	salary-earners	male	2766	93
		female	1925	47
	wage-earners	male	131959	63
		female	29801	26
<i>Metals, engineering, vehicles</i>	salary-earners	male	591674	120
		female	6718	60
	wage-earners	male	1238041	74
		female	92306	28
<i>Chemicals. Oils, Grease etc.</i>	salary-earners	male	18026	84
		female	3077	42
	wage-earners	male	67172	56
		female	22878	23
<i>Wood, Furniture</i>	salary-earners	male	14557	97
		female	1600	48
	wage-earners	male	193139	66
		female	23664	24
<i>Paper, Prints, Books</i>	salary-earners	male	23960	74
		female	10845	37
	wage-earners	male	142573	53
		female	76586	19
<i>Building</i>	salary-earners	male	40187	111
		female	179	56
	wage-earners	male	993876	76
		female	209	33
<i>Textile Fabrics</i>	salary-earners	male	73923	59
		female	67459	30
	wage-earners	male	394282	42
		female	606325	25
<i>Skins, Leather, Hair</i>	salary-earners	male	3069	82
		female	324	41
	wage-earners	male	70861	59

		female	27662	34
<i>Clothing</i>	salary-earners	male	910	103
		female	984	51
	wage-earners	male	397425	71
		female	761756	33
<i>Food, Tobacco, Drink</i>	salary-earners	male	215025	69
		female	94812	34
	wage-earners	male	278853	49
		female	132966	20
<i>Finance, Insurance, banking</i>	salary-earners	male	51099	94
		female	1204	47
	wage-earners	male	34963	72
		female	470	33
<i>Distribution</i>	salary-earners	male	80996	80
		female	45541	40
	wage-earners	male	415099	61
		female	56772	37
<i>Transport</i>	salary-earners	male	69317	104
		female	431	52
	wage-earners	male	1139461	58
		female	17316	35
<i>Public Administration</i>	salary-earners	male	134735	93
		female	24738	65
	wage-earners	male	205190	54
		female	1762	38
<i>Professionals</i>	salary-earners	male	155549	269
		female	2950	101
	wage-earners	male	156069	134
		female	291692	51
<i>Personal Services</i>	salary-earners	male	17418	79
		female	28021	39
	wage-earners	male	42699	44
		female	331882	26
<i>Domestic services</i>	wage-earners	male	244078	44
		female	1330819	19
<i>Without occupation</i>	unknown	male	1977283	44
		female	2971299	19
<i>Owners Agriculture</i>	Owners	male and female	375400	196
<i>Owners Industry & Trade</i>	Owners	male and female	1121810	303

Table A2.3. Structure of the samples by work status and gender

Total Active Population							
Census benchmark years	Sample (in thousands)	% of total population*	Occupied		Unoccupied		
			Males (%)	Females (%)	Males (%)	Females (%)	
Germany	1907	26,915	43.4	75.0	25.0	47.4	52.6
	1925	31,684	50.8	70.2	29.8	44.1	55.9
	1933	34,268	52.5	68.4	31.6	47.8	52.2
	1939	42,138	60.8	67.4	32.6	47.2	52.8
	1950	29,574	43.3	72.3	27.7	34.6	65.4
Britain	1901	19,740	60.7	69.8	30.2	40.0	60.0
	1911	22,569	62.7	70.3	29.7	35.1	64.9
	1921	22,703	59.9	70.5	29.5	32.8	67.2
	1931	23,336	58.4	70.3	29.7	31.5	68.5
	1951	25,471	58.4	69.2	30.8	41.5	64.9

Sources: See text

*For percentages of total population we use: total population in Great Britain from population statistics compiled at GB Historical GIS/ University of Portsmouth, England and Wales through time <http://www.visionofbritain.org.uk>; and total population in Germany from *Statistisches Jahrbuch*.

Table A2.4. Structure of the samples by work categories

	Census benchmark years	Work categories (% of total active population)			
		Owners	Salaried employees	Wage- workers	Unoccupied
Germany	1907	17.3	13.4	56.6	12.7
	1925	14.6	19.4	53.9	12.1
	1933	13.0	18.5	51.5	17.0
	1939	11.5	19.4	51.4	17.7
	1950	15.2	23.7	52.9	8.2
Britain	1901	7.6	9.2	58.1	25.1
	1911	6.5	9.9	55.7	27.8
	1921	7.3	7.8	60.2	24.7
	1931	7.1	6.9	66.5	19.5
	1951	5.5	9.3	65.1	20.2

Sources: See text

A3. SOURCES AND DATA

GERMANY

Table A3.1 Sources of data earnings for Germany (1900-1950)

Source	Period	Data	Type	Sectors and sub-sectors:
Hohls (1995)	1900/20 1924/50	Average full-employment earnings	Annual/ Wage + salary earners	<p>Agriculture</p> <p>Mining</p> <p>Construction and civil engineering</p> <p>Basic materials, production and capital goods industry: industries of the rocks and soils; manufacture of basic metals; metals, machinery and transport equipment; chemical industry; pulp and paper production; electrical and optical equipment and musical instruments</p> <p>Consumer goods industry: fine ceramic and glass industries; woodworking and processing; paper and cardboard processing industry; printing industry; leather production and processing; textile and clothing industry.</p> <p>Food and related products industry: sugar industry; meat manufacturing; other food and beverage industry; brewers and maltsters; tobacco industry.</p> <p>Trading: Wholesale and retail trade</p> <p>Transport and post: Imperial or Federal post office; Imperial or Federal railroad; private and light rail vehicles; commercial vehicle postures; inland waterways; maritime.</p> <p>Public administration</p> <p>Services without military and personal services: trading, administrations (banking, insurance); health and welfare; public administration.</p>
Hoffmann (1965)	1900-13 1925-50	Average full-employment earnings	Annual/ Wage + salary earners	<p>Agriculture, Forestry, Fisheries</p> <p>Industry and crafts</p> <p>Trade, banking, insurance, restaurants</p> <p>Traffic:</p> <ul style="list-style-type: none"> • Railways • Post • Shipping <p>Total services without defense:</p> <ul style="list-style-type: none"> • Administration, justice, education • Health, church, literature, art • Pharmacists and hairdressers • Domestic services <p>Defense</p>
Board of trade (1908) Statistisches Jahrbuch (1913-1950)	1907,1913, 1925,1930, 1933,1936, 1939, 1950	Average wage rates	Weekly/ Wage and salary earners	<p>Building</p> <p>Engineering</p> <p>Electrical</p> <p>Textile, Clothing, and Allied Trades, Dyeing and Chemical Cleaning Works</p> <p>Printing</p> <p>Wood-working Trades, Furniture Factories</p> <p>Food, Drink</p> <p>Leather Trades</p> <p>Miscellaneous Trades and Industries</p> <p>Transport</p>
Bry (1960)	1913,1925, 1939,1950	Average wage rates and earnings	Weekly and hourly/ Skilled and unskilled workers Males and females	<p>Coal mining</p> <p>Building</p> <p>Metals</p> <p>Woodworking</p> <p>Printing</p> <p>Chemicals</p> <p>Paper products</p> <p>Textiles</p> <p>Papermaking</p>

Table A3.2. Source of estimations of average earnings in Germany by sector

Sector	Estimations for periods 1900-1920 / 1924-1950	Source of assumptions
Agriculture	From Hohls (1995)	
Mining	From Hohls (1995)	
Quarrying, earth, energy	Estimated as average earnings in mining	Hoffmann (1965)
Building	From Hohls (1995)	
Metal working	Estimated as average earnings in basic materials	Board of Trade (1910) Bry (1960) Statistisches Jahrbuch (1913-1950)
Chemical	Estimated as average earnings in basic materials	
Paper, printing	Estimated as the 80% of average earnings in basic materials	
Wood, furniture	Estimated as average earnings in consumer goods industry	
Textile	Estimated as the 80% of average earnings in consumer goods industry	
Leather	Estimated as the 110% of average earnings in textile industry	
Clothing industry	Estimated as the average earnings in textile	
Food, drinks and tobacco	From Hohls (1995)	
Trade	From Hohls (1995)	
Transport	From Hohls (1995)	
Public administration	From Hohls (1995)	
Insurance, banking, finance	Estimated as the 46% of average earnings in public administration	Hoffmann (1965)
Catering and personal services	Estimated as the 53% of average earnings in services	
Social services	Estimated as the 120% of average earnings in public administration	
Domestic services	Estimated as the 30% of average earnings in services	

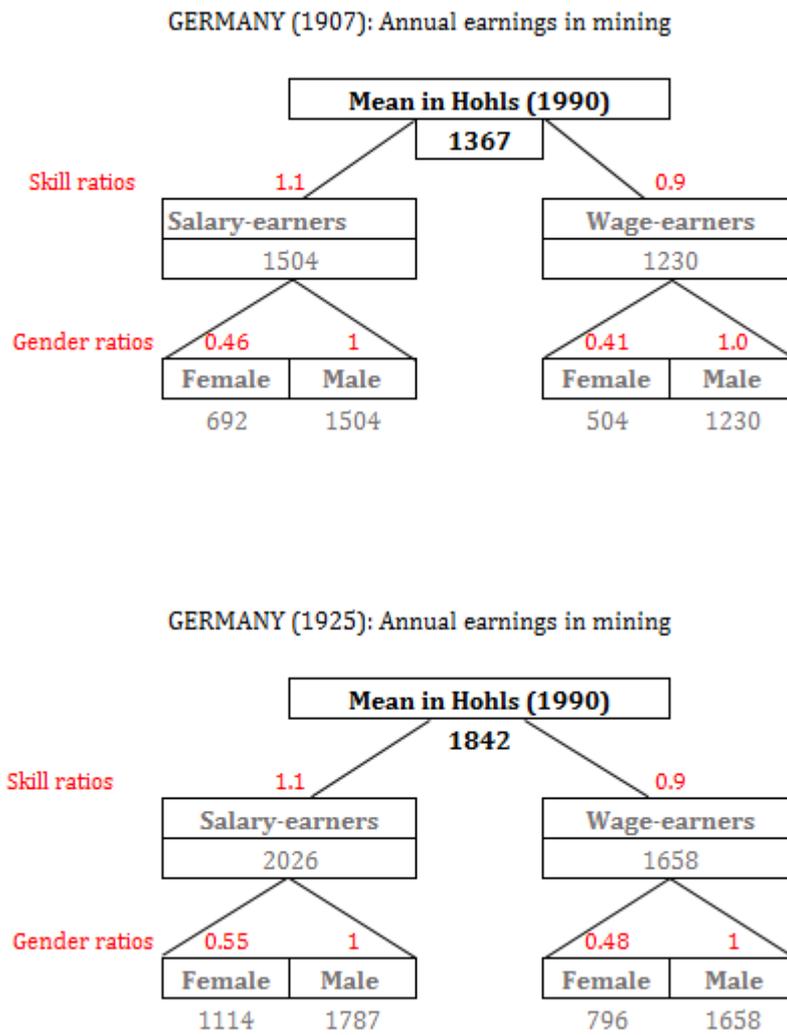
Table A3.3. Sources and estimations of earnings differences by work categories and period across sectors.

Sector:	Salaried employees	Wage-earners	Sources of assumptions:
Agriculture			
Mining	1913: 120% mean, 1925, 1930, 1939 and 1950: 110% mean	90% mean	Statistisches Jahrbuch (1913-1950)
Quarrying, earth, energy	= Mining	= Mining	
Building	1905,1913,1925, 1930, 1939 and 1950: 110% mean	1907: 80% mean; 1913, 1925, 1930, 1939 and 1950: 90% mean	Bry (1960) and Statistisches Jahrbuch (1913-1950)
Metalworking	1907, 1913: 120% mean, 1925,1930, 1939 and 1950: 110% mean,	1907, 1913: 80% mean, 1925,1930, 1939 and 1950: 90% mean	Bry (1960) and Statistisches Jahrbuch (1913-1950)
Chemical industry	= Metalworking	= Metalworking	
Paper industry	1905,1913,1925,1930, 1939 and 1950: 120% mean	1905, 1913, 1925, 1930, 1939 and 1950: 80% mean	Bry (1960) and Statistisches Jahrbuch (1913-1950)
Wood industry	1905,1913, 1925: 120% mean; 1930, 1939 and 1950: 110%	1913, 1925, 1930, 1939: 80% mean; 1950: 90% mean	Bry (1960) and Statistisches Jahrbuch (1913-1950)
Textile	1905, 1913, 1925, 1930, 1939 and 1950: 110% mean	1907: 80% mean; 1913, 1925, 1930, 1939 and 1950: 90% mean	Bry (1960) and Statistisches Jahrbuch (1913-1950)
Leather	= Textile	= Textile	
Clothing industry	= Textile	= Textile	
Food and beverages	1905, 1913, 1925, 1930, 1939: 120% mean; 1950: 110% mean	1905, 1913, 1925, 1930, 1939: 120% mean; 1950: 110% mean	Bry (1960) and Statistisches Jahrbuch (1913-1950)
Trade	= Transport	= Transport	
Transport	110% mean	90% mean	Statistisches Jahrbuch (1927-1930)
Public administration	= Transport	= Transport	
Insurance, banking	= Transport	= Transport	
Catering	= Transport	= Transport	
Social Services	= Transport	= Transport	
Domestic services	No considered	100% mean	

Table A3.4. Sources and estimations of earnings differences by gender and period

Sector:	Female salaried employees	Female wage-earners	Source:
Agriculture	Like mean in industry: 1913, 1924, 1929,1939, 1950 =69, 66, 68, 71, 63% (respectively) of skilled men	Like mean in industry: 1913, 1924, 1929,1939, 1950 =65, 64, 66, 70, 69% (respectively) of unskilled men	Bry (1960) and Statistisches Jahrbuch (1913-1950)
Mining	1913, 1924, 1929,1939, 1950 =46, 55, 59, 60, 57% (respectively) of skilled men	Like mean in industry: 1913, 1924, 1929,1939, 1950 =41,48, 54, 65, 70% (respectively) of unskilled men	
Quarrying, earth, energy	Like in Mining	Like in Mining	
Building	Like in Textile	Like in Textile	
Metal working	Like in Textile	Like in Textile	
Chemical	Like in Textile	Like in Textile	
Paper, printing	1913, 1924, 1929,1939, 1950 =52, 59, 60, 57, 54% (respectively) of skilled men	1913, 1924, 1929,1939, 1950 =70, 62, 63, 62, 61% (respectively) of unskilled men	
Wood, furniture	Like in Paper, printing	Like in Paper, printing	
Textile	1913, 1924, 1939, 1950 =78, 83, 84, 65% (respectively) of skilled men	1913, 1924, 1939, 1950 =84, 81, 78, 70% (respectively) of unskilled men	
Leather	Like in Textile	Like in Textile	
Clothing industry	Like in Textile	Like in Textile	
Food, drinks and tobacco	Like in Paper, printing	Like in Paper, printing	
Trade	Like in transport	Like in transport	
Transport	Like mean in industry: 1913, 1924, 1929,1939, 1950 =69, 66, 68, 71, 63% (respectively) of skilled men	Like mean in industry: 1913, 1924, 1929,1939, 1950 =65, 64, 66, 70, 69% (respectively) of unskilled men	
Public administration	Like in transport	Like in transport	
Insurance, banking, finance	Like in transport	Like in transport	
Catering and personal services	Like in transport	Like in transport	
Social services	Like in transport	Like in transport	
Domestic services	No considered	No considered	

Figure A3.1. Estimation of annual earnings by work status and gender at two different census benchmark years. Example for mining sector.



Note: Sources of estimations of skill and gender ratios are detailed in tables A3.3 and A3.4 of this Appendix.

BRITAIN

Table A3.5. Sources of data earnings for UK, by period, data type, and sector.

Source	Period	Data	Type	Sectors and sub-sectors:
Feinstein (1990)	1911	Average full-employment earnings	Annual/ Wage-earners	Agriculture Mining Building Gas, electricity, Transport Distributive trade Public Administration Miscellaneous services Domestic services Manufacturing: Bricks, pottery, glass Metals, engineering Chemical Wood, furniture Paper, printing Textile Skins, leather Clothing Food
Feinstein (1990)	1900-13	Average full-time money earnings	Index (1911=100) Wage-earners	Agriculture Mining Building Transport Distributive trade Public Administration Manufacturing: Glass Metals, Engineering Furniture Printing Cotton, wool Other textiles Clothing All sectors
Source	Period	Data	Type	Sectors and sub-sectors
Feinstein (1995)	1900-51	Average full employment earnings	Weekly *Transformed into annual (49.2 weeks in agriculture; 52 weeks in other sectors) Wage-earners	Agriculture Coal mining Building Metal engineering Cotton textiles All manual
Feinstein (1972)	1920-38	Income from employment: Total wages, Total salaries People employed: Total *The number of wages earners and employees estimated by applying to the total the proportions in Chapman 1953	Annual Wage-earners Salaried-earners	Agriculture Mining Manufacturing Building Gas, electricity, Transport Distributive trade Insurance, banking Public Administration Professional services Miscellaneous services
Chapman (1953)	1920-38	Income from employment: Average wages, Average salaries People employed: Total, Wage earners, Employees	Annual Wage-earners Salaried-earners	Like Feinstein (1990)

Table A3.6. Sources and estimations for wage-earnings across 20 braches.

Sectors	1900-1913	1914-1919	1920-1938	1938-1950
Agriculture	Feinstein (1990): 1911 benchmark estimate on Agriculture projected with the fishing's index (1911=100)	1913 estimation projected forwards using the evolution of "total manual" earnings in Feinstein (1995)	Feinstein (1995)	
Mining	Feinstein (1990): 1911 benchmark estimate on mining's average projected with the mining's index (1911=100)	Idem	Feinstein (1995)	
Building	Feinstein (1990): 1911 benchmark estimate on building's average projected with the building's index (1911=100)	Idem	Feinstein (1995)	
Manufacturing	Feinstein (1995): Average textiles, engineering, shipbuilding and vehicles			
Metal engineering	Feinstein (1990): 1911 benchmark estimate on metal engineering's average projected with the metal's index (1911=100)	Idem	Feinstein (1995)	
Bricks, pottery, glass	Feinstein (1990): 1911 benchmark estimate on bricks and glass's average projected with the glass's index (1911=100)	Idem	Chapman (1953)	Estimated in respect to Manufacturing, using the Census of Production's (1978) ratios in 1935,1948, 1949,1950 (ratios interpolated for years in between)
Chemical	Feinstein (1990): 1911 benchmark estimate on chemical projected with the manufacturing's index (1911=100)	Idem	Chapman (1953)	Estimated in respect to Manufacturing, using the Census of Production's (1978) ratios in 1935,1948, 1949,1950 (ratios interpolated for years in between)
Paper, printing	Feinstein (1990): 1911 benchmark estimate on paper and print's average projected with the printing's index (1911=100)	Idem	Chapman (1953)	Estimated in respect to Manufacturing, using the Census of Production's (1978) ratios in 1935,1948, 1949,1950 (ratios interpolated for years in between)
Wood, furniture	Feinstein (1990): 1911 benchmark estimate on furniture projected with the furniture's index (1911=100)	Idem	Chapman (1953)	Estimated in respect to Manufacturing, using the Census of Production's (1978) ratios in 1935,1948, 1949,1950 (ratios interpolated for years in between)
Textile	Feinstein (1990): 1911 benchmark estimate on textile's average projected with the cotton and wool's index (1911=100)	Idem	Feinstein (1995)	
Leather	Feinstein (1990): 1911 benchmark estimate on leather projected with the other textile's index (1911=100)	Idem	Chapman (1953)	Estimated in respect to Textiles, using the Census of Production's (1978) ratios in 1935,1948, 1949,1950 (ratios interpolated for years in between)
Clothing industry	Feinstein (1990): 1911 benchmark estimate on clothing projected with the other textile's index (1911=100)	Idem	Chapman (1953)	Estimated in respect to Textiles, using the Census of Production's (1978) ratios in 1935,1948, 1949,1950 (ratios interpolated for years in between)
Food, drinks and tobacco	Feinstein (1990): 1911 benchmark estimate on food's average projected with the manufacturing index (1911=100)	Idem	Chapman (1953)	Estimated in respect to Manufacturing, using the Census of Production's (1978) ratios in 1935,1948, 1949,1950 (ratios interpolated for years in between)
Transport	Feinstein (1990): 1911 benchmark estimate on transport's average projected with the transport index (1911=100)	Idem	Feinstein (1972)*	Estimated in respect to Manufacturing, using the Census of Production's (1978) ratios in 1935, 1948, 1949,1950 (ratios interpolated for years in between)
Trade	Feinstein (1990): 1911 benchmark estimate on distribution projected with the distribution index (1911=100)	Idem	Chapman (1953)	1938 estimation projected forwards using the evolution of Total wages in Feinstein 1972
Public administration	Feinstein (1990): 1911 benchmark estimate on government and defense's average projected with the public administration's index (1911=100)	Idem	Chapman (1953)	Idem
Insurance, banking	Feinstein (1990): 1911 benchmark estimate on post office projected with the all sectors' index (1911=100)	Idem	Feinstein (1972)*	Idem
Professionals	Routh Guy (1965): 1911 benchmark estimate on teacher (in 1913) projected with the all sector's index (Feinstein 1990)	Idem	Teachers' earnings in Chapman (1953)	Idem
Catering	Feinstein (1990): 1911 benchmark estimate on catering projected with the all sectors' index (1911=100)	Idem	Chapman (1953)	Idem
Domestic services	Feinstein (1990): 1911 benchmark estimate on domestic services projected with the all sectors' index (1911=100)	Idem	Feinstein (1972)*	Idem

Table A3.7. Sources and estimations for salaries across 20 braches.

Sectors and sub-sectors	1900-1920	1920-1938	1938-1950
Agriculture	Salary earnings=300% of wage earnings according to Feinstein (1972)*	Feinstein (1972)*	1938 estimation projected forwards using the evolution of Total salaries in Feinstein 1972
Mining	Salary earnings=130% of wage earnings according to Feinstein (1972)*	Feinstein (1972)*	From 1938 to 1948: Salaries=170% of wages according to Feinstein's (1972) skill ratio in 1938. From 1948 to1950: Salaries=120% of wages according to the Census of production's (1978) skill ratios in 1948, 1949, 1950.
Building	Foremen's earnings=146% of men's average in building according to the Board of trade (1908b) and Routh (1965, p.82)	Feinstein (1972)*	1938 estimation projected forwards with the evolution of wage-earnings in building (from Feinstein 1990)
Manufacturing	Foremen's earnings=150% of men's average in mining according to the Board of trade (1908b) and Routh (1965, p.82)	Feinstein (1972)* During this period manufacturing skill ratio ranges from 1.6 to 1.9	From 1938 to 1948: Salaries=180% of wages according to Feinstein's (1972) skill ratio in 1938. From 1948 to1950: Salaries=170% of wages according to the Census of production's (1978) skill ratios in 1948, 1949, 1950.
Bricks, pottery, glass	Foremen's earnings=149% of men's average in bricks according to the Board of trade (1908b) and Routh (1965, p.82)	Salaries estimated by applying the same skill ratios obtained for manufacturing (from Feinstein 1972 and Census of Production 1978)	
Metal engineering	Foremen's earnings=161% of men's average in metal engineering according to the Board of trade (1908b) and Routh (1965, p.82)	Salaries estimated by applying the same skill ratios obtained for manufacturing (from Feinstein 1972 and Census of Production 1978)	
Chemical	Foremen's earnings=150% of men's average in chemicals according to the Board of trade (1908b) and Routh (1965, p.82)	Salaries estimated by applying the same skill ratios obtained for manufacturing (from Feinstein 1972 and Census of Production 1978)	
Paper, printing	Foremen's earnings=139% of men's average in paper according to the Board of trade (1908b) and Routh (1965, p.82)	Salaries estimated by applying the same skill ratios obtained for manufacturing (from Feinstein 1972 and Census of Production 1978)	
Wood, furniture	Foremen's earnings=146% of men's average in wood according to the Board of trade (1908b) and Routh (1965, p.82)	Salaries estimated by applying the same skill ratios obtained for manufacturing (from Feinstein 1972 and Census of Production 1978)	
Textile	Foremen's earnings=140% of men's average in textile according to the Board of trade (1908b) and Routh (1965, p.82)	Salaries estimated by applying the same skill ratios obtained for manufacturing (from Feinstein 1972 and Census of Production 1978)	
Leather	Foremen's earnings=141% of men's average in leather according to the Board of trade (1908b) and Routh (1965, p.82)	Salaries estimated by applying the same skill ratios obtained for manufacturing (from Feinstein 1972 and Census of Production 1978)	
Clothing industry	Foremen's earnings=146% of men's average in clothing according to the Board of trade (1908b) and Routh (1965, p.82)	Salaries estimated by applying the same skill ratios obtained for manufacturing (from Feinstein 1972 and Census of Production 1978)	
Food, drinks and tobacco	Foremen's earnings=140% of men's average in clothing according to the Board of trade (1908b) and Routh (1965, p.82)	Salaries estimated by applying the same skill ratios obtained for manufacturing (from Feinstein 1972 and Census of Production 1978)	
Transport	Foremen's earnings=182% of men's average in transport according to the Board of trade (1908b) and Routh Guy (1965, p.82)	Feinstein (1972)*	From 1938 to 1948: Salaries=130% of wages according to Feinstein's (1972) skill ratio in 1938. From 1948 to1950: Salaries=120% of wages according to the Census of production's (1978) skill ratios in 1948, 1949, 1950.
Trade	Like in transport	Chapman (1953)	1938 estimation projected forwards using the evolution of Total salaries in Feinstein 1972
Insurance, banking, finance	Like in transport	Feinstein (1972)*	1938 estimation projected forwards using the evolution of Total salaries in Feinstein 1972
Catering and personal services	Like in transport	Chapman (1953)	1938 estimation projected forwards using the evolution of Total salaries in Feinstein 1972
Public administration	Salary earnings= 170% of wage earnings according to Chapman (1953)	Feinstein (1972)*	1938 estimation projected forwards using the evolution of Total salaries in Feinstein 1972
Professionals	200% of lower professionals (Guy 1965, table 30)	Doctors' earnings in Chapman (1953)	1938 estimation projected forwards using the evolution of Total salaries in Feinstein 1972
Domestic services	x	x	x

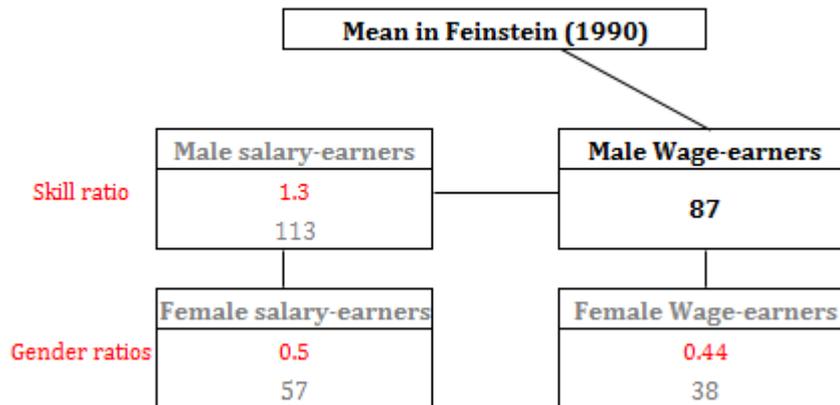
*Estimations from Feinstein (1972). Result of dividing Total Wages between the number of wage earners (or employees). The number of wages earners (employees) has been estimated by applying the proportions of wage earners (employees) in Chapman 1953 to Feinstein's (1972) totals.

Table A3.8. Assumptions for earnings differences by gender across branches.

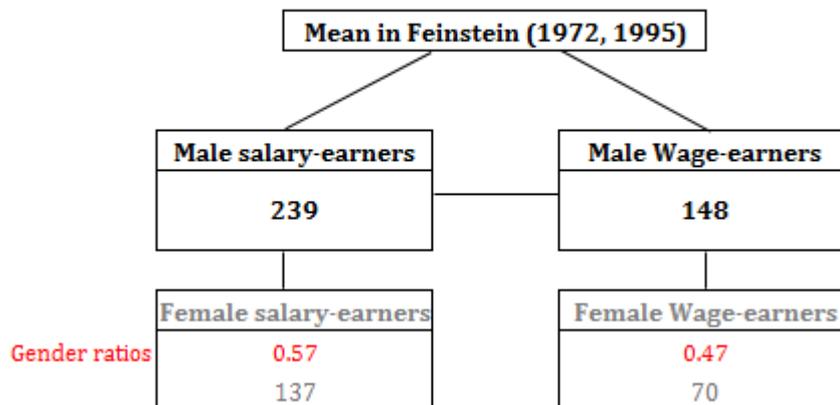
Source	Estimations	Work status	Source:
All sectors	Foremen women's earnings = 50% of men's in 1913/14; 57% in 1924; and 57% in 1938; 60% in 1955	Salaried earners	Routh (1965, p.104)
All sectors	Unskilled manual women's earnings =40% of men's in 1906; 57% in 1924; 56% in 1935 and 52% in 1955	Wage-earners	Routh (1965, p.104)
Mining	Unskilled women's earnings in average industry =43.7 of men's in 1906; 47.7 in 1924; 48.3 in 1931 and 48 in 1935.	Wage-earners	Jane Lewis (1984 ,table 11, p.164) based on Bowley 1937
Building	Unskilled women's earnings in average industry=43.7 of men's in 1906; 47.7 in 1924; 48.3 in 1931 and 48 in 1935.	Wage-earners	Jane Lewis (1984 ,table 11, p.164) based on Bowley 1937
Bricks, pottery,	Women's earnings in bricks=41.4 of men's in 1906; and 46.1 in 1938	Wage-earners	Routh (1965, p.59):
Metal engineering	Women's earnings in metal industry=38.1of men's in 1906; 44.7 in 1924; 47.6 in 1931 and 45.7 in 1935.	Wage-earners	Jane Lewis (1984 ,table 11, p.164) based on Bowley 1937
Chemical	Women's earnings in chemicals= 41.4 of men's in 1906; and 46.1 in 1938	Wage-earners	Routh (1965, p.59)
Paper, printing	Women's earnings in paper industry=36.4 of men's in 1906; 39.6 in 1924; 39.4 in 1931 and 37.3 in 1935.	Wage-earners	Jane Lewis (1984, table 11, p.164) based on Bowley 1937
Wood, furniture	Gender ratios like in paper	Wage-earners	Jane Lewis (1984, table 11, p.164) based on Bowley 1937
Textile	Women's earnings in textiles=58.5 of men's in 1906; 56.1 in 1924; 56 in 1931 and 55.9 in 1935.	Wage-earners	Jane Lewis (1984, table 11, p.164) based on Bowley 1937
Leather	Gender ratios like in textile	Wage-earners	Jane Lewis (1984, table 11, p.164) based on Bowley 1937
Clothing industry	Women's earnings in clothing=46.3 of men's in 1906; 49.1 in 1924; 50.2 in 1931 and 51.2 in 1935.	Wage-earners	Jane Lewis (1984 ,table 11, p.164) based on Bowley 1937
Food, drinks and tobacco	Women's earnings in food=41.5 of men's in 1906; 48.1 in 1924; 48.7 in 1931 and 47 in 1935.	Wage-earners	Jane Lewis (1984 ,table 11, p.164) based on Bowley 1937
Trade	Shop assistants women's pay = 60% of men's in 1906; 57.5% in 1924; 70% in 1935 and 60% in 1955	Wage-earners	Routh (1965, p.92,95)
Transport	Gender ratios like in trade	Wage-earners	Routh (1965, p.92,95)
Insurance, banking, finance	Clerks women's earnings = 45% of men's in 1913, 58% in 1924; 51% in 1935 and 60% in 1955	Wage-earners	Routh (1965, p.79)
Catering and personal services	Gender ratios like in trade	Wage-earners	
Public administration	Civil service women's pay = 69.8% of men's in 1911; 60% in 1924; 59.6% in 1935 and 71.5% in 1955	Salaried earners	Routh (1965, p.79) for
	Women clerical assistants = 70% of women clerical officers In 1924; 68% in 1935; and 82% in 1955	Wage-earners	Routh (1965, p.79)
Professionals	Estimate on qualified teachers (in 1913) projected with the all sector's index (Feinstein 1990)	Salaried earners	Routh (1965) and the all sector's index (Feinstein 1990)
	Estimate on nurses (in 1913) projected with the all sector's index (Feinstein 1990)	Wage-earners	
Domestic service	Gender ratios like in all sectors	Wage-earners	Routh (1965, p.104)

Figure A3.2. Estimation of annual earnings by work status and gender at two different census benchmark years. Example for mining sector.

BRITAIN (1907): Annual earnings in mining



BRITAIN (1925): Annual earnings in mining



Note: Sources of estimations of skill and gender ratios are detailed in tables A3.7 and A3.8.

