

Wages, Inequality and Consequences for the Economy

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for the Economy

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ABSTRACT

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This dissertation consists of four research articles and an introductory chapter. The introduction gives an overview about the field of income inequality, an empirical overview of its development, a discussion of methodological issues and a summary of the four articles.

Article 1 gives new empirical evidence on internal migration's macro-economic impact factors in Sweden from 1967 to 2003. The dynamic panel model's more accurate estimation contradicts recent results arguing that wage differences play no or only a minor role in migration in Sweden.

Article 2 provides a comparative analysis of the development of the gender wage gap in Germany and Sweden during the period 1960–2006. The analysis accounts for micro- and macro-economic factors and politics and concludes that norms and traditions penetrate institutional settings and ensnare Germany in a cultural trap with regard to gender equality.

Article 3 gives a comprehensive empirical overview of the evolution of wage inequality in Sweden over the twentieth century. It shows that a true equality revolution took place during the 1930s and 1940s, hence before the fully fledged welfare state came into being, raising the question of whether a universal welfare state system requires an equal income distribution. On our way to finding a mechanism that links inequality and the welfare state together, we find that trust is a factor that facilitates the implementation of social policies aiming at redistribution.

Article 4 compares wage inequality in 12 European countries, the US and Australia, estimating its impact on labour productivity for the period 1970–2006. The results indicate that wage inequality hampers productivity growth mainly through an indirect effect on employment, namely as an intensification of the employment–productivity trade-off in Europe. By contrast, inequality is productivity-increasing in the US and Australia.

KEYWORDS: wage inequality, gender gap, internal migration, productivity, welfare state, GMM, 2SLS, Sweden

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It was on one of those grey Swedish winter days that I realized that my time as a PhD student was approaching the finishing line. As a new PhD student, it had taken some time for me to understand what it really means to be a researcher. Several people guided the way, accompanying my development step by step, and deserve my deepest gratitude.

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Sitting in a room at the department, engrossed in work, could quite quickly lead to the impression that the world circulates around the research cloud in which one lives. To prevent this feeling, I am lucky to have friends and family inside and outside academia who can lift me out of this cloud. During lunch meetings with my friends, we shared common problems, successes and fortunately many things that happen outside research life.

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Gothenburg, February 2014

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Introduction

If we believe the words of Robert Shea, “a permanent division of labor inevitably creates occupational and class inequality”. In other words, as long as we have a division of labour, we can do nothing about inequality. Nevertheless, or probably because this is conceived to be true, researchers have been extraordinarily interested in the development of and reasons for different kinds of inequality. Inequality itself is a broad term, often used in a normative sense by the majority of society, but will be investigated in this thesis from a scientific and analytical perspective.¹ Inequality can exist in almost every sphere of social life, be it health, education, opportunity or, the focus here, income and wages. Since the level of economic inequality has a decisive impact on many spheres of daily life, different kinds and consequences of wage inequality are captured in the four articles forming this dissertation thesis.

The dissertation at hand focuses on the specific form of wage inequality and tries to illuminate some forms and consequences of it. The thesis consists of four self-contained essays with the common theme of wage inequality. It is located in the field of historical labour economics with a strong empirical orientation. In order to understand the forces driving economic inequality as well as its long-run impact on society, we need to study the trends in inequality over time and hence conduct a historical examination. The level of inequality shapes institutions and is at the same time influenced by the institutional set-up. As Waldenström (2009) points out, institutions evolve slowly over time. This makes a long-run, historical perspective in the field of inequality research reasonable. As the particular research questions and hence the data vary, it is no surprise that the time periods examined differ between the articles. The longest time period, namely almost the entire twentieth century, is covered in paper three, concerning the Swedish welfare state. Since the other articles are not only descriptive but also analytical, the time span is reduced to the post-war period.

Essay one, with an exclusive focus on Sweden, estimates the impact of regional wage inequality on internal migration. A new econometric method challenges the results that the extraordinarily low wage dispersion in Sweden makes migration independent from income incentives. The second essay takes a comparative approach, trying to explain why the gender wage gap diminished to a remarkable extent in the Swedish context while remaining more or less stagnant in Germany. Besides economic factors, political

1 I will elaborate further on the term “inequality” in the next section.

regulation and cultural ideologies are taken into account. The third paper gives a comprehensive empirical overview of the evolution of wage inequality in Sweden over the twentieth century. It shows that the true equality revolution took place during the 1930s and 1940s, hence before the fully fledged welfare state came into being, raising the question of whether a universal welfare state system requires an equal income distribution. The final essay contains a panel analysis of 14 countries, trying to uncover the impact of inter-industry wage inequality on labour productivity. The analysis shows how far inequality works through the mechanism of employment and how far the impact differs between the US and Australia on the one hand and twelve European countries on the other.

In the next sections, a methodological discussion elaborates on the difficulties in calculating reliable indicators to capture the degree of and make inferences about the trend of inequality. Subsequently, a discussion about wages as the focal variable and an overview of historical wage data follow. Presenting a brief overview of inequality research will show how this thesis is located in the broad field of historical labour economics. Some empirical evidence will provide the reader with a numerical impression of economic inequality. After that, the different chapters of the dissertation will be summarized and their contributions emphasized. Before entering form and content, we should first clarify why inequality research is an important, meaningful and lasting research topic.

1. Inequality – Why do we care?

While inequality research has become a popular research topic recently, some years ago, investigating inequality levels was labelled as exciting as “watching the grass grow” (Aaron, 1978). The reason was that inequality levels were relatively stable (Gottschalk & Smeeding, 1997). This stability is remarkable considering the changes in economic structure that have occurred throughout the world. Increasing globalization connected with increasing international competition and a loss of labour’s bargaining power and technological changes that require more skilled labour and accordingly draw a line between skilled and unskilled workers are just two examples that could justify an increase in inequality. However, the inequality level we detect is very dependent on the indicator and time span to which we refer. Stability, which is often claimed further back in time, might not be detectable if we zoom in on a certain time period or a certain country or use a specific measurement. Hence, methodological issues cannot be omitted while talking about inequality in general and wage inequality in particular.

While inequality can refer to many spheres, clarification of the concept of inequality should precede the reasons why its investigation is important. The scientific problem with inequality is that most people have feelings about it and thus the perception of inequality can be called connotative (Salverda et al., 2009). Every discussion about inequality is interconnected with the normative discussion of fairness (Atkinson & Bourguignon, 2000; Gottschalk & Smeeding, 1997). Besides describing a pure level of income distribution, for many people it has an ideological meaning (Salverda et al., 2009). Many people believe that economic equality has considerable moral value in itself and efforts to approach the egalitarian ideal should be accorded (Frankfurt, 1987). In contrast to this is Frankfurt's (1987) statement that even from a moral point of view it is more important that everyone has enough than that everyone has the same. According to him, equality is not morally desirable for its own sake (Frankfurt, 1999). However, the reason why he supports the efforts to eliminate inequality is that it leads to undesirable discrepancies in opportunities or entitlements. Further, he says that "in many circumstances greater equality facilitates the pursuit of other socially desirable aims" (Frankfurt, 1999:p.146). This consideration provides, according to Frankfurt (1987:p.24), "convincing reasons for recommending equality as a desirable social good".

On moral grounds, many of us would agree that we cannot accept too high levels of inequality, be it in education, in income or in other spheres. Nevertheless, most of us would probably conceive some amount of inequality as fair, as a person with a university degree deserves a higher income than an unskilled worker. Levels of equality that are too high eliminate incentives such as accumulating human capital. Thus, from an economic perspective, the perception of inequality is unclear. While Lazear (1989) argues that equality is desirable on efficiency grounds, other authors agree that total equality is not a desirable political goal (Dworkin, 2000; Feldstein, 1999; Fleurbaey, 1995; Welch, 1999). The reason is that equality is seen as a trade-off with responsibility. The economic agents need to bear the consequences of their choices (Fleurbaey, 1995).

However, the decisive question that then follows is: what degree is acceptable? How low must inequality be to be called equality? This discussion is related to whether we see inequality in absolute or in relative values. While the debate connected to poverty can be measured in absolute terms of one dollar per day, it can be seen in relative terms and define people who earn less than 60% of the median incomes in one country as poor (Atkinson et al.,

2002).² In inequality research, no broadly accepted threshold exists. Hence, the question of the comparative part is even more important. In international standards, Sweden is among the countries with the lowest inequality levels. Compared with most countries of Latin America, the inequality level of Sweden is not worrisome. However, comparing today's levels of inequality with those of 1980, the increase might be alarming. Inequality is hard to compare between countries with different institutional backgrounds, such as welfare states or tax systems. Each society needs to decide against this background which level of inequality is acceptable and bearable by the welfare state and the society's cohesion.

The topic of inequality in general and that of economic inequality enjoy great public debates in society. However, from a scientific view as well, there are several reasons why we should care about economic inequality.

First, from an individual perspective, almost all people have encountered some form of inequality. Women might feel discriminated against by earning less despite having exactly the same job, the same education and the same experience as their male colleagues. People employed in one region of a country might regard the wage rates of another region enviously. Many examples can be found in which economic inequality enters our daily life, and that is one reason why we, as researchers, should try to explain its patterns. As mentioned above, inequality exists as long as the division of labour. Inequality increases and decreases over time, and researchers struggle to find a convincing reason for each change.

Second, leaving the micro-perspective and turning to a macro-perspective, most governments in the Western world are concerned about inequality levels that are too high. *Ceteris paribus*, most societies find a reduction in inequality desirable (Dalton, 1920) and it is part of the political agenda of many governments (Harris, 2002). The increase in income inequality during the past two decades has been accompanied by a common reaction in the media, in political debate and in academic discussions perceiving increased inequality as a problem (Feldstein, 1999). Besides the moral grounds described above, there is an instrumental reason why we care from a macro-perspective. As Welch (1999:p.2) says, "all of economics results from inequality", be it unequally distributed skills over individuals or comparative advantages between countries that lead to trade, to mention just two examples. As these kinds of

2 The indicator mainly used by the World Bank and UNDP to determine poverty has been changed to \$1.25/day as extreme poverty and \$2.5/day as poverty. The relative poverty measurement is adjusted to household composition and counts 1.0 for the first adult, 0.5 for the second adult or children older than 14 and 0.3 for children under 14. Hence, for a family with two children, an income of less than $2.1 * 60\%$ of the median income would be perceived as being below the poverty line.

inequalities have consequences, so does wage inequality. This second reason is the one that stands in the focus of the dissertation. Economically and institutionally as well, inequality has an impact, as this dissertation shows, on some chosen cases. As Dalton already mentioned in 1920, economists are primarily concerned about the effects of income distribution. Wage inequality explains to a certain extent the shape of institutions like the welfare state, migration patterns or economic growth.

Although we encounter some form of inequality in daily life and research has worked within this field for many years, many puzzles remain unsolved. One reason might be that different perceptions exist in society. As Mankiw (2013) mentions, the issue of inequality is tangent to both economics and political philosophy. The judgement of inequality, and especially its consequences, evolves political and social values (Mankiw, 2013). We can approach the meaning of inequality from the word's origin, which was already in use in 1484. In these early times, inequality meant differences in rank or dignity. As one's personal standing in today's society is often linked to one's income, this definition, more than 500 years old, is still applicable. In philosophy, equality – as the opposite of inequality – is defined as “correspondence between a group of different objects, persons, processes or circumstances that have the same qualities in at least one respect, but not all respects” (Gosepath, 2011). Due to this definition, the next issue that needs to be defined is equal “in what respect” (Rae, 1981:p.132f)? Suddenly, we are involved in a methodological question regarding how to capture different forms of inequality. In the philosophical but also the economic literature, economic inequality is often seen as synonymous with income inequality. Sen (1997), however, emphasizes that the distinction is important to narrow the concept of income inequality. That is why every work about inequality needs a detailed description of the inequality concept.

2. Concepts of measurement

Particular to the topic of economic inequality is the difficulty of correct and clear-cut measurement. This section provides an overview of the prospective pitfalls and different indicators as well as a brief presentation of the measurements that are used in the thesis at hand. The kind of measurement is an important feature that unifies all four articles.

The measurement problem is complicated by taking a long-run perspective and hence handling scarce data sources. This already applies to the investigation of one country, but the supreme discipline of a comparison of economic inequality over regions, gender, countries or time is summed up

by Atkinson as “entering a statistical minefield” (Atkinson, 1995:p.4). The problem is not only that no unified theory exists (Atkinson & Bourguignon, 2002), but also that due to the lack of comparable historical data it can be hard to combine theory and empirical investigations (Salverda et al., 2009). The paucity of long-run, reliable statistical evidence is one of the main problems in empirical economic history research. In particular, micro-data that offer detailed distributional information are a limited source for the investigation of long-term inequality trends (Waldenström, 2009). Not only the scarcity of the data but also data collected at different points of time cause methodological risks. These kinds of data are often not comparable; hence, conclusions about changes over time must be drawn with caution (Atkinson, 1999).

Depending on the research aim, different indicators are used. In an article published in 1970, Atkinson argues that one problem is the correct measurement of inequality and conceptual issues (Atkinson, 1970). Forty years later, no ground-breaking indicator that deals with all the concerns exists and the problem is still as true as it was in 1970. Kraus (1981) summarizes the problems in analysing income distribution in two dimensions: definitions of income and data sources. The further we look back in history, the more the material welfare is dependent on the actual market income, as taxes, transfers and public services were less pronounced. As income can refer to capital, transfers or labour income, it further needs to be defined whether market or disposable income, earnings or wages are the basis for calculation. The sources, especially for historical income distributions, are mainly tax statistics. More recently, sample surveys have increased, though they do not usually cover a longer time span. In comparative inequality research, it is for instance necessary to pay attention to whether the Gini coefficient refers to tax statistics in one country and to survey statistics in another one. Tax statistics cannot be compared if the income units are not properly defined or differ over time and countries. This is where the recipient unit, a third factor, plays an important role: is the unit of investigation the individual or the household (Kraus, 1981)? Finally, to compare statistics in a panel setting, not only does the cross-sectional dimension need to be similarly defined, but also the time dimension. Sometimes, earning statistics are given monthly, weekly or even daily. Over time, the age cohorts in a country might change, which can influence the earnings distribution. Further difficulties emerge in the comparison of an indicator between countries. Gottschalk and Smeeding (2000) mention, for instance, differences in labour markets that affect earnings differently, differences in sources and returns of capital and the possibility of age distribution varying among countries as tax and transfer policies do. To conclude, research within the field of income distribution has a multiplicity of

perspectives (Atkinson & Bourguignon, 2000). In the last decades, effort has been made to harmonize definitions, a clear advantage for recent inequality research (Salverda et al., 2009).

After clarifying Sen's (1980) question "Inequality of what?", an indicator needs to be calculated. Following the different variables and units of interest, a whole bunch of different indicators exist.³ Earlier, the Italians Vilfredo Pareto and later Corrado Gini tried to find a statistical measurement to describe the inequality level (Ceriani & Verme, 2012; Gini, 1912; Gini, 1921; Lorenz, 1905; Pareto, 1895; Pareto, 1897). Discontent with Pareto's alpha instructed Gini to develop a superior indicator, which is still heavily used today (Giorgi, 1999). However, the Lorenz curve and the Gini coefficient as its numerical summary require individual or household income, which first became available in the 1960s and is very scattered over time (Jenkins & Kerm, 2009).⁴ Furthermore, the Gini index does not allow decomposition into within- and between-group inequality (Giorgi, 1999). With Atkinson's (1970) criticism that no indicator ranks income according to a strictly concave social utility function, new interest in the topic emerged. As each indicator has its advantages and drawbacks, it is of special importance to be aware of the respective pitfalls and amenities to choose the right one for a particular research question.

Quantile ratios, for instance the 90/10 ratio, are often used in inequality research. They have the advantage that they can be decomposed, i.e. equal to the product of the 90/50 ratio and the 50/10 ratio. As a result, information could be gained on how far the 90/10 ratio is driven by inequality at the top of the distribution versus inequality at the bottom end. The shortcoming of not showing developments between the eleventh and the eighty-ninth percentile can be overcome by the use of additional indicators, such as the Gini coefficients (The World Bank, 2000:p.372).

The conventional approach is to use a summary statistic such as the variance, the coefficient of variation, the relative mean deviation, the standard deviation of logarithms or the Gini coefficient to describe the level of inequality.⁵ No explicit reason exists for why one should prefer one over the other in general terms, though the choice would differ according to the research question and data availability. All the mentioned indicators, except the variance, are defined relative to the mean. This implies that they are unaffected by equal proportional increases in all incomes. The use of variance implies increasing inequality aversion, while this is assumed to be constant for the other

3 For an overview, see for instance Cowell (2000) or Cowell (2011).

4 Cowell (2011) and Jenkins and Kerm (2009) give an introductory overview of inequality measurement.

5 For formulas and a discussion of the different measurements, see Atkinson (1970).

measures. The coefficient of variation attaches equal weight to transfers at different income levels, while the Gini coefficient attaches more weight to transfers affecting the middle class and the standard deviation weights transfers at the lower end more heavily (Atkinson, 1970). The dissertation is mainly concerned with the relative standing of different groups, like gender, industries or regions, which is why relative wages are used and the gender wage gap, i.e. $\left(1 - \frac{wage_{female}}{wage_{male}}\right) * 100$, is used to calculate the percentage gap between male and female wages. The gap can then be decomposed into an explainable and an unexplainable part after a regression analysis. For the regional inequality, the wage share $\frac{w_{it}}{w_{jt}}$ between different counties i and j at the same time t is calculated. In articles three and four, the coefficient of variation is used to determine for instance inter-industry inequality. It is defined as $CV = \frac{\sigma}{\mu}$ with σ as the standard deviation and μ as the mean. For a comparative analysis of different variables over time, indices need to be calculated. An index number reflects a price, for instance a wage, compared with a standard or base value. Using a fixed basis, the coefficient of variation for each year t can for instance be set in relation to a basis year b to see the development over time, $\frac{CV_t}{CV_b}$. It is no longer dependent on the unit of measurement and is therefore applicable to comparisons. More statistical indicators are used as supplementary measurements: first, the rural/urban wage ratio as a further relative wage indicator; second, the Gini index as available; and third, the relative income shares from tax statistics. Since these indicators sometimes rely upon different income concepts, they are used as supplementary evidence to support the insights from wage statistics that are at the heart of the calculations.

3. The focal variable

After describing the different statistical measures and general pitfalls in inequality research, a localization of the income concept at hand needs to be made. As mentioned before, the definition of income and unit of recipients can be manifold but are at the same time crucial for inequality research. The “focal variable” (Sen, 1992) in the dissertation is wage rates. It offers large data sources and renders data comparison possible over a long time span (Brandolini & Smeeding, 2009). This is of particular importance in a comparative economic history study. The advantages of wages as the unit of

income are highlighted in the following section by comparing them with other concepts.

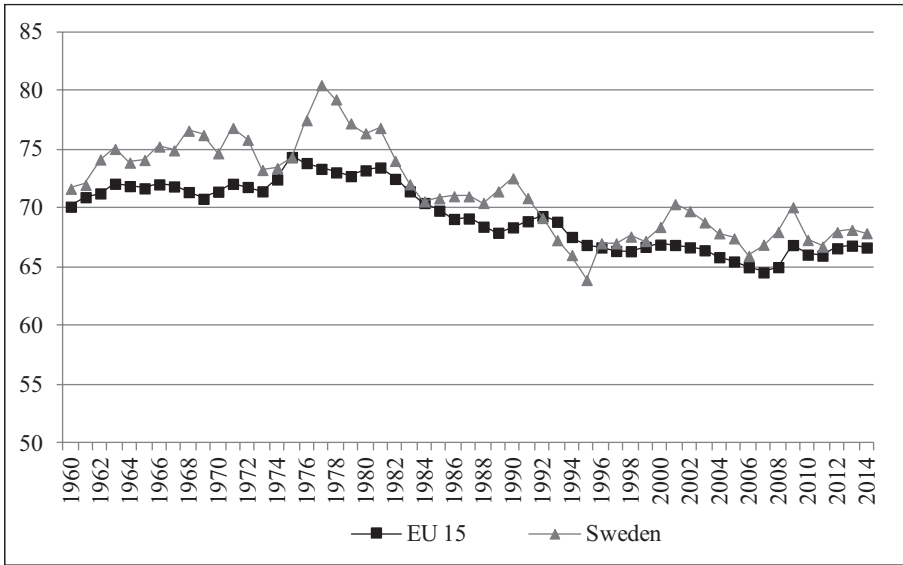
One issue of the calculation of economic inequality is the confrontation of income and consumption as the underlying concept. Often it is argued that consumption is the better indicator as it enters the individual's utility function. It includes all kinds of income, from savings to any kind of employment or transfer. Income might be superior since it shows the power to consume independently of whether the individual spends a lot. Jenkins and van Kerm (2009:p.42) summarize this fact by "a miserly millionaire is considered rich rather than poor". The dissertation focuses on a special type of income: wages. Wages play a decisive role not only in the economy, but also for each worker personally. They determine the income together with the number of hours worked. They give signals about disequilibria on the labour market equalizing scarcity and abundance. The aim here, however, is not to look at the absolute value of wages, but to look at the relative standing of different groups of the society, such as industries, regions or gender. Montgomery and Stockton (1994:p.206) stress the importance of relative wages as a "critical determinant of the allocation of labour resources across sectors".

A purely practical reason in favour of wages as the focal variable is its data abundance in history. While most historical research has to rely on tax statistics, wages offer a further perspective from the labour angle. Tax statistics are often used to focus on the upper tail of the distribution; wage statistics allow the estimation of the dispersion within the working class. In addition, Blau and Kahn (2009) find a strong positive relationship between the extent of earnings and hourly wage inequality across many countries. Hence, the changing inequality in wages has an important impact on the changes in overall inequality (Gustafsson & Palmer, 1997). An example from the US shows that in the 1980s the rise in wage inequality was sufficient to counteract the effects of the economic expansion in reducing poverty. Blau and Kahn (2009:p.177) argue that "the level of wage inequality generated by a country's labour market is of fundamental importance". Why is that the case?

Labour earnings are by far the most important component of the national income and wage rates are a central determinant of family and individual incomes (Blau & Kahn, 2009). Even though some researchers argue that the whole income including transfers should be considered, it is not the wish of any citizen to be dependent on state benefits. Wages give an unbiased picture of what people earn purely from their work. Hourly wages are not blurred by individual decision making in terms of working hours. They are not biased by different tax systems or household formations. The importance of wages from a macro-perspective shows the wage share. In the mid-1970s, the OCED average of the adjusted wage share (relative to GDP) was 75%. Though slightly

declining since the 1980s, we still talk about two-thirds of the income being generated by wages (65% in 2007) (ILO, 2013). As we can see in Figure 1, this holds true for Sweden in particular. It follows the European path and the adjusted wage share still lies around 66% (Stockhammer, 2013).

FIGURE 1 Adjusted wage share of the total economy (in % of GDP at the current factor cost)



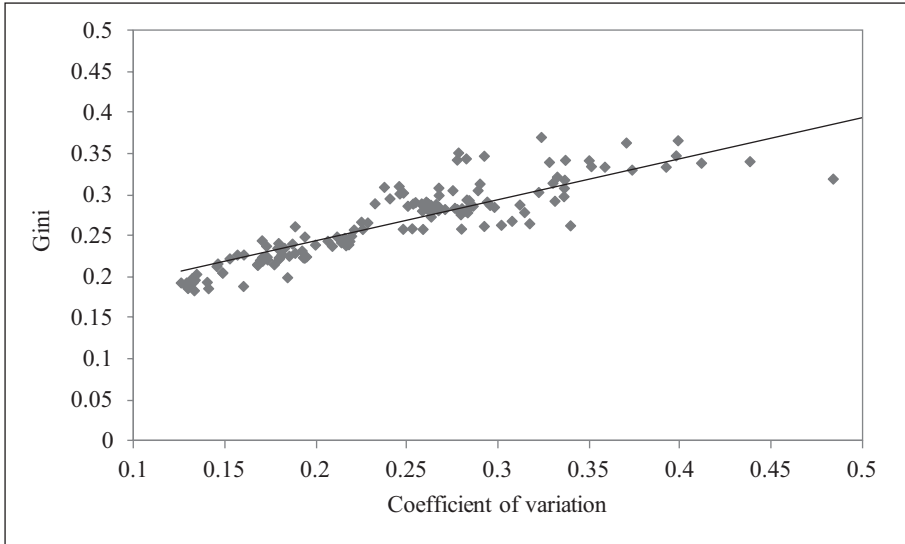
Source: Ameco database.

Note: Until 1990, only West Germany was included in the EU-15 sample.

Labour market inequality determines disparities in living standards and affects, among other things, social solidarity. Individual wage inequality is theoretically linked to returns to skills and associated with economic incentives, for instance to gain human capital. From a macro-perspective, centralized wage bargaining in general reduces wage differentials, but it tends to limit firms' flexibility to react to market forces (Blau & Kahn, 2009). Depending on the unit of investigation, wage income can be linked to many factors in economic, political and social life, whether gender gap, migration, productivity or the welfare state. This dissertation shows that wage inequality may not be overlooked in explaining these patterns. Of course, the impact of other forms of inequality should not be denied. A serious scientific investigation, however, needs to illuminate these issues from different perspectives, among which wage inequality is important. Figure 2 shows that wage

inequality often, even if not always, displays similar trends to other indicators. Here, the coefficient of variation of wages between industries is contrasted with the Gini coefficient for 14 countries for the period 1970–2006.⁶

FIGURE 2 Comparison of inequality indicators



Note: Gini coefficients from the OECD income distribution and poverty database (www.oecd.org/els/social/inequality). Coefficients of variation from the EUKLEMS labour compensation (see article four).

The scatter plot shows a clear, positive relationship and a high correlation of about 0.8472. Hence, wage inequality can be used as a reliable indicator if no other statistic is available far back in history. Of course, different indicators may deviate from each other at certain points of time and each of them illuminates a certain aspect, such as the share of the very rich people or the dispersion among the working class.

6 The included countries are Australia, Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Sweden, the United Kingdom and the United States. The data refer to 39 industries (NACE Codes C, D 10–41, E 40–41, F). See article four for more detailed information.

4. Historical wage statistics and inequality research

4.1 Studies on Swedish wage statistics

Besides tax statistics, wages are an indicator that is available far back in history and provides useful information to gain an impression of the standard of living and inequality in earlier times. Whereas the dissertation makes use of existing wage statistics for analytical purposes, some researchers have gathered and discussed Swedish wage statistics. Prado (2010) describes the development of Swedish wages in 1860–2007 based on nine industry groups and an aggregated manufacturing series. In general, long-run discussions of Swedish wage series are few and often rely on one highly aggregated series. Bagge, Lundberg and Svenilson (1933, 1935) construct seven industry series and one relating to agricultural workers for an earlier time period (1870–1913). Bagge et al. (1933, 1935), in their project, rely on wage rates from about 100 firms. These are not without concerns. Bo Gustafsson (1965), for instance, criticized the method for omitting temporary workers, leading to an upward bias in the calculated wage level. More complete is the series by Jungenfelt (1966), who covered all the major sectors in his annual series for 1870–1950. The same period is part of Björklund and Stenlund's (1995) series of six industrial branches. The further we look back in history, the more difficult it is to find reliable and comparable wage data over time. A major change occurred in 1913, when the Social Board established official wage statistics for the industrial sector. From then on, average hourly earnings are at our disposal. By gathering survey data on firm declarations of wages and similar information, the total sum of paid wages was divided by the total sum of worked hours or days or workers (Prado, 2010).⁷ All of the wage data are nowadays assembled in a forthcoming database, the Historical Labour Database (HILD). The wages further distinguish between regular working time, overtime, holiday pay and time and piece rates. The huge advantage of these wage series is the formation of a very long comparable series, which makes it possible to indicate wage movements from 1913 onwards. Furthermore, a much broader part of the industrial sector is covered than in earlier attempts, and has increased over time. Of course, the way in which the data were constructed is not without criticism. For instance, they do not account for the changing composition of workers, like skills, age or the proportion of part-time workers. One has to keep in mind that the data are aggregated on a macro-level and cannot be used to answer micro-economic questions. Since the first wage statistics were published in 1919, wages from 1913 until that date have been based upon

⁷ See Prado (2010) for a detailed discussion of the history of Swedish wage statistics.

belatedly given information. Hence, they are less reliable and only available with gaps (Bagge et al., 1933; Prado, 2010).

In sum, the HILD offers sector wages, in which the industrial sector is the most complete and detailed and also offers regional classifications. The wages are given in nominal numbers separately for women and men. Besides the statistics of the Social Board, the HILD database assembles different sources to give as broad and consistent a picture of wages in the economy as possible. The data that were published in different official reports are sorted with regard to sectors (service, industry and agriculture), regions and branches. While the wages in the industrial sector are given per hour (and per day and year for earlier periods), wage data in the service sector display monthly earnings only. Three out of the four papers use, *inter alia*, data from the HILD. Since each paper deals with a special topic in the research on historical wage inequality, some of them use additional data sources, for instance the paper about the gender wage gap includes a micro-level study that demands individual data, which are provided by the Luxembourg Income Study.⁸ Paper four, as another example, takes an international view and therefore relies upon a broader database, in this case the EUKLEMS database for growth and productivity accounts. A detailed data description is given within the papers, due to the specialized topics.

4.2 Inequality research

The specific research on the outcomes of wage inequality and the use of historical wage statistics is what silhouettes this thesis against earlier ones. To highlight the contribution of my thesis, some existing research areas need to be circumscribed.

The existing literature can be divided into at least four streams. First, there are purely descriptive studies about different kinds of economic inequality. Second, descriptive and analytical studies are particularly concerned with wage inequality, often measured in relative wages. Explanatory studies try to explain, third, the patterns behind the periods of ups and downs in inequality and, fourth, the outcomes of inequality. However, the outcomes and reasons might be endogenously correlated.

A purely descriptive study about economic inequality in Sweden is for instance Ragnar Bentzel's (1953) thesis about income distribution in the period 1930–1949. Like Bentzel (1953), Spånt (1976, 1979) also refers to a general income concept for the period 1920–1976. Not only do these studies refer

⁸ The income distribution survey (HINK) for the Swedish case and the German Social Economic Panel Study (GSOEP) for the German comparison.

to a different time span and income instead of wages, their focus is descriptive. This also applies to the empirical study by Jungefelt (1966), who focuses on income distribution and the wage share, providing a large amount of data for the period 1870–1950. Söderberg (1987, 1991) provides a description of inequality from the mid-eighteenth to the mid-twentieth century. Entering the period of investigation that overlaps with my own, Waldenström's (2009) dissertation is based upon wealth inequality in general and top income data in particular, in contrast to wage inequality. Using tax data, which are especially useful for studying the rich, he draws a very accurate macro-picture of the development of wealth shares in Sweden over the twentieth century. Björklund and Palme (2000) show the development of family income inequality in Sweden from 1951 to 1973, in contrast to Spånt (1976, 1979), who analyses individual income. Further Swedish, though analytical, studies are offered by Jansson's (2011) thesis, which besides inequality deals with questions of poverty and income mobility. With the help of micro-data on top income shares, she provides additional insights into the overall development of inequality in Sweden. Gustavsson (2004) makes inference about trends in earnings inequality for 1960–1990 in comparison with the US. He uses longitudinal earnings data and decomposes annual earnings into permanent and transitory components. Many of the studies, especially those that extend further back in time, are obsessed with the correct measurement and description of the evolution of inequality. More recent studies often make use of micro-data, whereas my dissertation is mainly performed from a macroeconomic view. Thus, for instance, paper three uses different forms of wage inequality to complete the existing picture of inequality in Sweden's history with accurate statistics. The different streams of inequality research are of course also traceable in the international research community. Descriptive country studies are of course manifold, and for instance gathered in Kaelble, Brenner and Thomas' (1991) work on income distribution and Blau and Kahn's (2009) article on earnings distribution (see also Danziger and Gottschalk (1993) for income inequalities in America).

Particularly concerned with wage inequalities, i.e. wage structures, gender earning gaps and wage dispersion in OECD countries, are Freeman and Katz (1995). Gender gaps are also covered by Blau and Kahn (1992, 1997, 1999, 2006) and Burnette (2008) for an earlier time period than that covered here. A long-run analysis of gender wage differences in the period 1920–1995 in Sweden is provided by Svensson (2003, 2004) in a similar approach to Goldin (1990) for the United States. Further antagonists in the Swedish context in terms of gender wages in a historical context are Stanfors (2003) and Svensson (1995, 1996, 2003, 2004), as well as Edin and Richardson (2002). While the Swedish development of the gender wage gap is relatively well

investigated, comparative studies are few and that is where the second article of this thesis fits in. Contrasting Sweden with Germany brings out decisive differences that explain the development of the gender wage gap.

If we turn to the outcomes of inequality from an international perspective, Jeffrey G. Williamson, among other things, continues Kuznet's (1955) heritage focusing on inequality and growth during the Industrial Revolution, which further leads him to discussions about rural to urban migration. In addition, Timothy Hatton's work concentrates on historical labour markets and wage gaps, as well as international and inter-regional migration (Hatton & Williamson, 1992, 1994; Hatton & Tani, 2005). The latter forms the research topic of the first article, though concerned with internal migration in Sweden. Williamson (1991) further links inequality to growth accumulation, asking the old question of whether policymakers have to choose between the two, concluding that inequality did not breed growth in history. Though mainly focusing on earlier times in history and the Anglo-Saxon world, his way of thinking about the consequences of inequality is quite similar to the way in which it is handled in this thesis. However, the geographical focus here embraces Europe in general and Sweden in particular. Furthermore, the methodological approach is more concerned with empirical estimation. Moreover, in a later book, Williamson together with Aghion (Aghion & Williamson, 1998) follow the "big issues" that emerged with Kuznet's (1955) pioneering work. What causes inequality and growth and how are these two related? Connected to this topic is the field of policies and institutions. Entirely in accordance with paper three in this thesis, they try to study not only the impact of institutions on equality and growth, but also vice versa. Article two, for instance, measures how far political regulation led to a downturn in the gender wage gap. While in the case of gender differences institutions are seen as a reason for changing relative wages, Lundh (2004) defines economic changes as a prerequisite for institutional changes in the Swedish labour market in 1830–1990. Thus, article three in this thesis not only describes the long-run development of different inequality measures, but also suggests a downturn in inequality to be a requirement for the Scandinavian welfare model.

The impact of institutions on productivity growth is further covered by Allard and Lindert (2007), whose approach is extended in paper four of this thesis by incorporating inter-industry wage inequality into the productivity equation. In a comprehensive book, Williamson and Lindert (1980) cover most of the prominent questions around macroeconomic inequality within a country. They describe inequality developments and discuss the existence of an equity–growth trade-off and potential explanations for American history.

The thesis at hand can be inserted into these research areas as it uses different forms of wage differences, i.e. regional, gender and inter-industry, as its

starting point to fulfil the overall purpose of explaining the differences and consequences of wage inequalities. A detailed literature review of the respective topic is left to the particular essays. However, this short overview already displays the complexity of inequality research, as it touches upon research in the fields of economics, history and labour. The thesis at hand contributes to the research community with a threefold approach. First, it has a comparative profile, which takes different angles in the particular essays as a comparison between gender, regions, industries or countries. Second, it describes the consequences of these differences in the form of productivity growth or migration. Third, it has a strong empirical and methodological focus, employing different estimation methods to give an accurate analysis of the investigated research questions. It adds more insights concerning the development of different forms of wage inequality on a macro-level and further estimates the consequences for different spheres of the society and economy. By doing so, each article shows that first, wage inequality matters. The effects are statistically proved, often set against the institutional and economic background and hence show that inequality in general and wage inequality in particular may not be overlooked in explaining a variety of patterns. Further, the varying levels of inequality, especially between countries, suggest that the interpretation of Robert Shea's quote might be challenged. I agree that a division of labour creates inequality. However, countries might be equipped with tools to counter the level of inequality, as for instance article two will show concerning the gender wage gap. To know whether it is worth it to dampen the level of inequality, we must be aware of its consequences, some of which are investigated in this thesis. As can be expected, there are many more spheres influenced by inequality that future research needs to investigate.

5. Stylized facts

5.1 The international view

While most of the articles in the dissertation deal with specific forms and outcomes of wage inequality, I would like to give a more general overview of the development of economic inequality in the introductory chapter. The international view will provide the reader with a feeling of the general development of different indicators over time and make a comparison with the Swedish inequality that follows, more instructively.

If we start with a very long-run perspective, Bourguignon and Morrison's (2002) article describes inequality among world citizens in 1820–1992. They show empirically that from the beginning of the nineteenth century inequality

increased, with a Gini coefficient ranging between 0.5 and 0.64.⁹ A break in this trend occurred after the Second World War and inequality started to decrease. While inequality at the beginning of the investigation period was mostly due to inequality within countries, it later changed to inequality between countries.

Available for the long run are tax statistics that, for instance, Piketty and Saez (2006) use to construct inequality. Figure 3 shows the inverted Pareto–Lorentz coefficient β , which is, according to Atkinson et al. (2011), more intuitive than the standard Pareto coefficient α .¹⁰ In general, a higher β coefficient corresponds to larger top income shares and hence higher income inequality.¹¹ A difference between the Pareto parameter and the top income shares is that the Pareto coefficient only captures the dispersion of incomes in the top tail and does not set them into relation with the average incomes. The value of β shows the fatness of the upper tail of the distribution.¹²

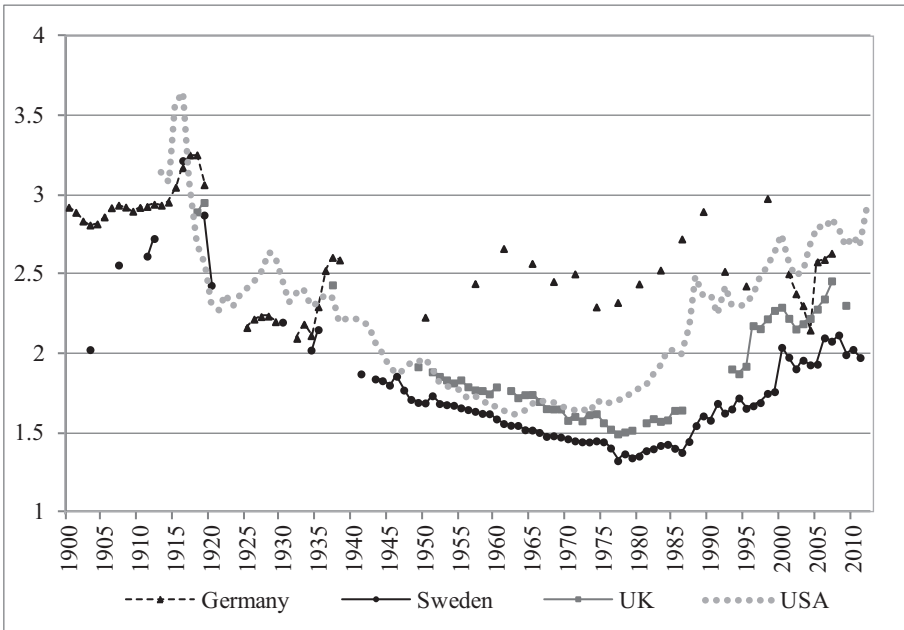
9 The data sources for income distribution in the 33 country groups differ by the period under analysis.

10 Cowell (2011:p.95ff) provides a detailed discussion of the Pareto coefficient.

11 The reverse is true for the Pareto–Lorentz coefficient α .

12 That the β coefficient is a useful indicator is shown by an example from the US. Estimated at the top percentile threshold and excluding capital gains, it increased from 1.69 in 1976 to 2.89 in 2007, while at the same time the top percentile income share increased from 7.9% to 18.9% (Atkinson et al., 2011).

FIGURE 3 The inverted Pareto–Lorentz coefficient



Source: World Top Income Database.

Note: The Pareto–Lorentz coefficients were estimated from the top 0.1% share within the top 1% share: $a=1/[1-\log(S1\%/S0.1\%)/\log(10)]$. The β is the inverse to give a more intuitive understanding; $\beta=a/(a-1)$.

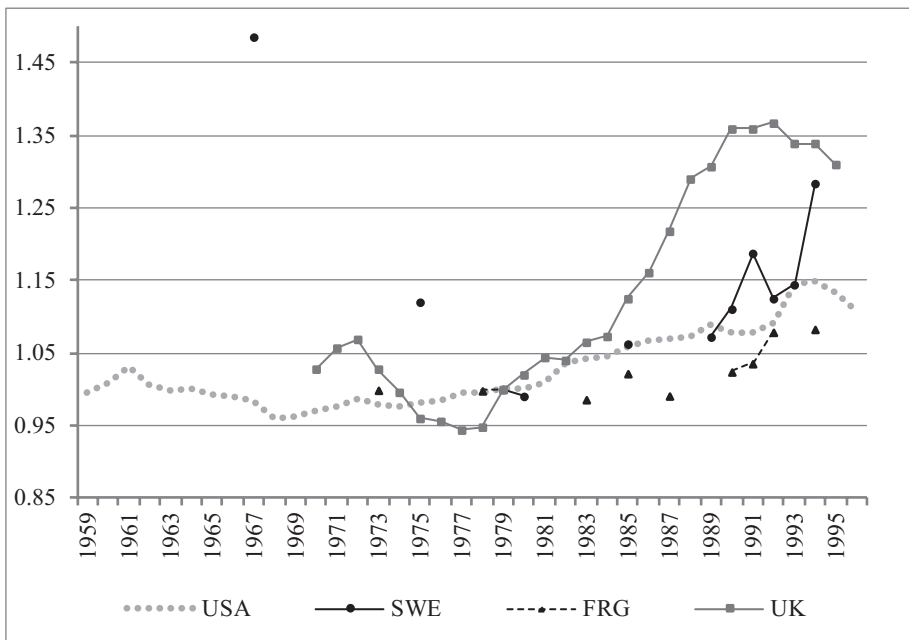
The small example consisting of the countries Germany, Sweden, the United States and the United Kingdom shows the long-run development over the twentieth century.¹³ While the data are rather scattered at the beginning of the period, all the countries have an inverted Pareto coefficient of about three during the First World War, which corresponds to an alpha of about 1.4 in Sweden in 1919. In all four countries, the share of the super rich decreases afterwards. All over the world, the differences in the beta coefficient were very low in 1949 between countries (see Atkinson et al., 2011). It reaches its minimal turning point, in other words the lowest inequality, at the end of the 1960s. Since then, an increase in inequality has been apparent. Whereas Sweden shows the lowest β over the whole time span, the development of the German

¹³ Since the geographical territory for Germany changed over the twentieth century, the series are based on Prussian data before 1918, the territory of the Weimar Republic after the First World War and then the Third Reich. After the Second World War, data for the Federal Republic of Germany (FRG) are used. After 1990, the data refer to the reunified Germany (see Dell, 2007).

indicator might be surprising. As Atkinson et al. point out, “Germany has always been characterized by a significantly larger concentration at the top than other continental European countries” (Atkinson et al., 2011:p.49). In conclusion, the inequality decreased after the First World War, with an interruption during the years of the world economic crisis and the following war years. The decreasing trend accelerated during the second half of the twentieth century and turned around since the 1980s. A further analysis of wealth inequality is given by Wolff (1996) using personal wealth as completion of the LIS data set gathering family wealth. He concludes that US wealth inequality has risen sharply since 1970, though declining since 1990. He argues against the generality of rising wealth inequality, calling it a rather stable development, which is at odds with the development indicated in Figure 3.

An overview of the comparative development after 1950 is given by Gottschalk and Smeeding (2000) using relative Gini coefficients for different countries. This is an index for each country with the basis year 1979, which is set to 1. Hence, it is useful for a comparative analysis and the development over time, though it does not provide information about the actual level of the Gini coefficient in the respective countries. Though the Gini coefficients refer to the household income in each country, the data sources differ between countries.

FIGURE 4 Relative Gini coefficients (1979=1)

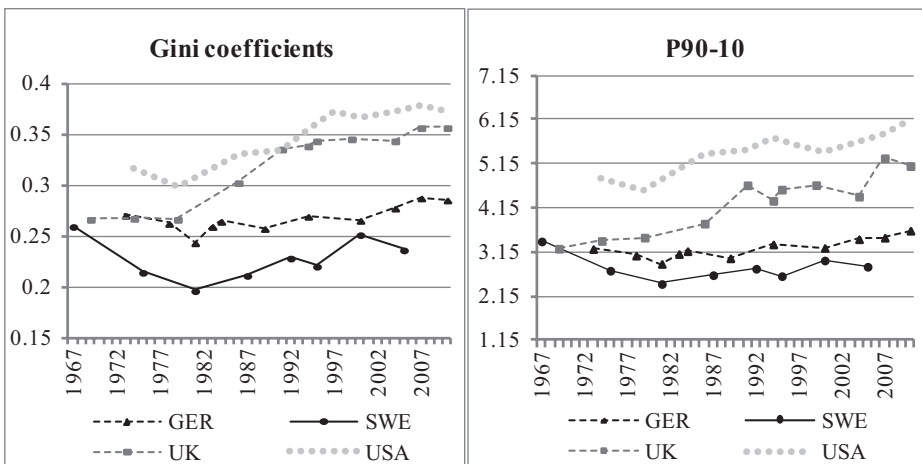


Source: Gottschalk and Smeeding (2000).

Except the series for the US, the data are only available with gaps. Nevertheless, the often-described increase in overall inequality since the 1970s becomes obvious. As the coefficients are given in indices, the level between the countries might differ. The United States, for instance, starts from a higher level. This explains why the United States experiences a smoother increase than its European counterparts, Sweden, West Germany and the United Kingdom. Especially sharp is the increase in the United Kingdom during the Thatcher era. The Swedish inequality dropped sharply during the 1960s and increased during the 1990s. The developments in Germany are rather stable compared with those of the other countries.

For shorter time periods, several projects launched comparable data, for example the Luxembourg Income Study. Figure 5 shows trends in the 90-10 ratio and the Gini coefficients in the four countries Germany, Sweden, the United Kingdom and the United States. The common 90-10 ratio shows the income earned by households at the ninetieth percentile divided by the earnings of workers at the tenth percentile. For example, if the 90/10 ratio equals four, then the poorest household of the richest 10% earns four times as much as the richest person of the poorest 10%. As quantile ratios do not reflect what happens in other parts of the distribution, the Gini coefficient is displayed to overcome this shortcoming (The World Bank, 2000:p.372).

FIGURE 5 Development of inequality indicators (1967–2010)



Source: LIS key figures inequality and poverty; the underlying concept is disposable income for households. The data refer to West Germany until reunification.

Though Figure 5 includes two different indicators to measure inequality, the displayed trend follows a comparable path. The Gini coefficients show an increase in all four countries. The changes in the Gini coefficient are more pronounced in the US than in Sweden or Germany. The differences between the United Kingdom and the United States are more distinct in the 90-10 ratio, while the differences between Germany and Sweden are more clearly visible in the Gini coefficient. The 90-10 ratios do not show a clear increase in inequality in Germany and Sweden. In both indicators, the US has the highest level of inequality and Sweden the lowest. Since both indicators are calculated on disposable income for households, this example shows differences that emerge from the underlying indicator. Björklund and Jäntti (2011) explain the differences between Sweden and Anglo-Saxon countries by different distributions of labour rather than capital incomes. However, at least as complex as the indicators of inequality are, as sweeping are the explanatory reasons behind them.¹⁴ Milanovic (2011:p.91) asserts that only a very few theories exist on the formation and evolution of income distribution. Considering the development over time, he states that “we do not have any single clear theory why the evolution of inequality should be like that”.

For the recent sub-period, however, the skill-biased technological change (SBTC) argument is the prevailing theoretical explanation. It ascribes the recent increase in wage inequality that has been common in most developed countries since the 1980s to an increasing demand for more skilled workers due to technology-intensive production that leads to diverging returns to skills (Gottschalk & Joyce, 1998; Gottschalk & Smeeding, 1997). In other words, the wages for skilled and unskilled workers are driven apart.

In sum, the inequality level changes quite frequently over the long run. Due to the recent increase since the 1980s, we have returned to a level comparable to that of the 1950s (Welch, 1999). Different indicators stress different parts of the income distribution, as this short overview shows. A more detailed description can be gained by focusing on a single country, as in the following section.

5.2 Sweden

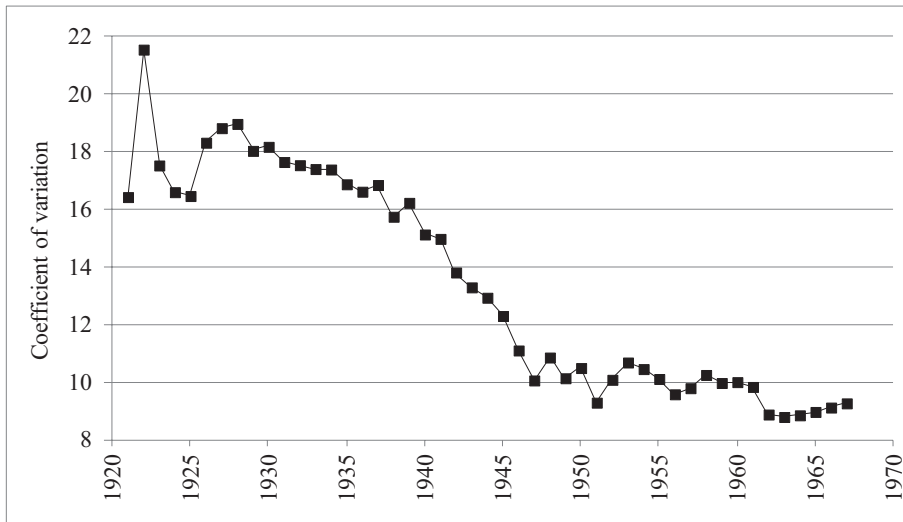
Sweden is an outstanding example of a country that has pursued a unique socio-economic course in the post-war period in, as Gustaffson and Palmer (1997) summarize it, four terms. First, it has solidarity and a strongly centralized wage policy. Second, its security system is universal and offers generous benefits.

¹⁴ The reader interested in explanations for economic inequality is referred to Neal and Rosen (2000).

Third, it has also performed comparatively well in terms of gender equality. A strong increase in female labour force participation and a relatively low gender pay gap provide the evidence. Finally, as part of its welfare state model, it has released former household activities such as child care to the market, which has further supported female work (Gustafsson & Palmer, 1997). Frequently, Scandinavia in general and Sweden in particular are claimed as role models in terms of equality, but how has the praised equality evolved over time?

The calculation of the inter-industry wage differentials (Figure 6) reaches far back in history. It shows that Sweden has not always been the ideal of equality, but that rather high inequalities in wages existed at the beginning of the twentieth century. The low inequality levels praised in today's times are a development of the 1930s and 1940s and stabilized in the post-war period. Furthermore, Morrisson (2000) describes Sweden as increasingly unequal in the period 1750–1890. According to him, and not at odds with the empirics presented here, the inequality then decreased from 1930. Björklund and Jäntti's (2011) description supports the view of an inequality downturn in 1930–1950, which weakened between 1950 and 1965. From 1965 to 1980, a second equality revolution took place and paved the way to the conclusion that Sweden had one of the most equal distributions of income among the industrialized countries at the end of the 1980s (Atkinson, 1995; Björklund & Palme, 2000; Gottschalk & Smeeding, 1997). This justifies Sweden's reputation in terms of equality, though Sweden also experienced an increase in inequality from the end of the 1980s (Björklund & Palme, 2000; Edin & Holmlund, 1995).

FIGURE 6 Inter-industry wage differentials (CV), 1921–1967



Source: Own calculations (HILD); see article three.

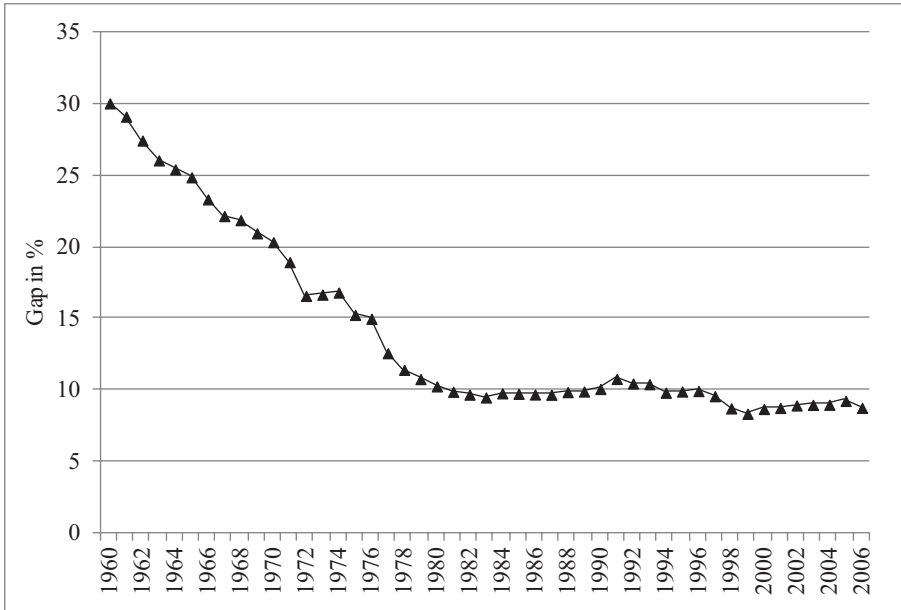
This impression is further underpinned by the development of other inequality indicators, such as the top income shares or the inter-county wage share during this time period (see paper three in this thesis).

After the Second World War, the inequality in Sweden decreased further. From a macro-perspective, economic inequality is often explained by aggregate economic forces, like inflation or the business cycles, which distort the wages' role in balancing supply and demand (Montgomery & Stockton, 1994). Wachter (1970, 1976) explains wage inequality by differing sensitivity between sectors to cyclical influences. High-wage sectors react less than low-wage sectors and hence higher unemployment results in a widening of wage dispersion. Against these market forces stands an institutional approach. It emphasizes the institutional setting, which limits wage inequality the more centralized the existent wage bargaining system is (Gottschalk & Joyce, 1998; Gottschalk & Smeeding, 1997). As from an international perspective, the leading Swedish debate also gathers among institutions versus market forces. While Edin and Holmlund (1995) focus on supply and demand factors, others, like Hibbs (1990), emphasize the impact of the solidarity wage policy. Indeed, an investigation into wage inequality in a Swedish context cannot ignore a discussion about the period of the solidarity wage policy. The solidarity wage policy, which was an attempt to reduce wage dispersion, was in force from the mid-1950s until 1983 (Edin & Holmlund, 1995). Through a coordinated wage policy, a fair and rational wage structure should be built up. This should be mainly achieved by increasing the wages at the bottom, while the wages at the top should be reduced (Busch-Lüty, 1964; Öhman & Schager, 1982). The negotiating partners recommended equal pay for equal work in different branches and the solidarity wage policy experienced its heyday during the 1960s and 1970s (Edin & Holmlund, 1995).

As the thesis considers regional and gender differences besides inter-industry inequality, the picture should be complete. Taking a look at the gender wage gap in the industrial sector, Figure 7 shows a very sharp fall in the wage differences between men and women in the period from the 1960s until 1980. It integrates into the overall fall of wage inequality in the post-war period. The explanation for this in contrast to the development in Germany is one issue considered in the second article.

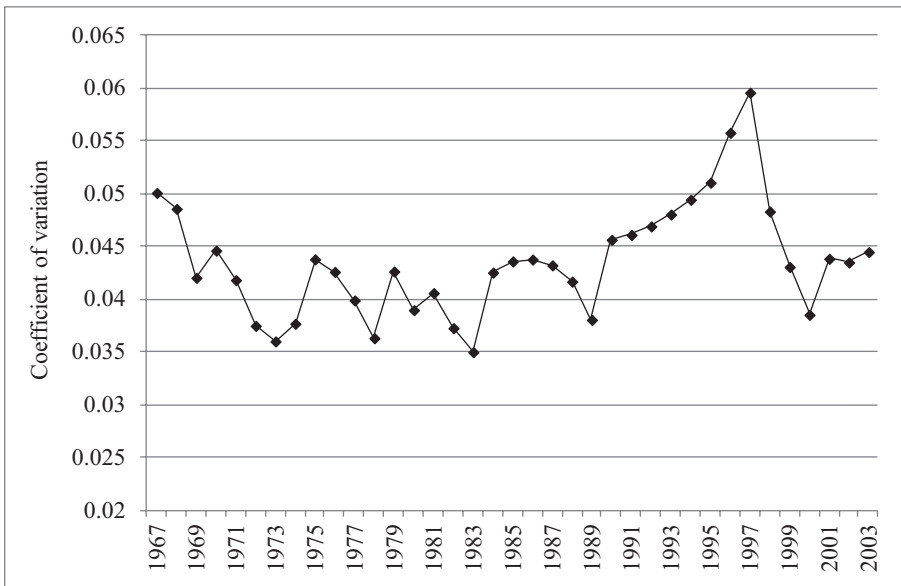
The results for the calculation of the coefficient of variation not between industries or genders but for the whole industrial sector between the Swedish counties are shown in Figure 8.

FIGURE 7 The gender wage gap in Sweden, 1960–2006



Source: HILD; see article two.

FIGURE 8 Inter-county wage inequality in the industry sector, coefficient of variation (1967–2003)



Source: HILD; see article one.

Unfortunately, the regional data first start in 1967, which makes a pronounced downturn in regional inequality only guessable. What can be proved, however, are the steadiness in inequality with cyclical trends and the increase in inequality starting with the crisis in Sweden in 1990, also observable internationally. Considering Figure 8, one has to keep in mind that the level, i.e. the size, of the coefficient varies between 0.03 and 0.06, which is in international terms outstandingly low. Nevertheless, these regional differences correlate with internal migration, as essay one further elaborates. As the development of inequality and the Swedish relative standing are set, we can turn to the particular research questions dealt with in the four articles.

6. The dissertation

6.1 New macro-economic evidence on internal migration in Sweden, 1967–2003

While inequality can exist between countries, the inequality between Swedish regions with the consequence of migration is the topic of paper one. This essay does not deal with individual migration decisions. Instead, it employs macro-data on the county level and challenges the idea that the Swedish wage dispersion is too low to correlate with internal migration. The paper's contribution is threefold. First, it corrects the idea that Swedish internal migration patterns are exceptional by following a counter-theoretical path.¹⁵ Second, it instructs readers who are interested in econometric methods in how different estimation methods lead to divergent results. Finally, it demonstrates the hindering impact of increasing female labour force participation on migration, a pattern that first evolved after 1990.

Economic theory predicts migration to rebuild equilibrium if wages or other labour market variables differ regionally. While this holds true in theory, the existing literature describes Sweden as an exception. As the differences in pay are extraordinarily low between Swedish counties, many researchers in this area conclude that Swedish internal migration can be explained by differences in employment possibilities, though not in wages (Dribe, 1994; Heibron, 1998; Westerlund, 1997, 1998, 2006). To challenge these results, this paper gives new empirical evidence on the macro-economic impact factors

15 While migration theory suggests that migration flows from low- to high-wage regions, the results of previous research are in that sense counter-theoretical as they conclude for Sweden that wages do not serve as an economic incentive for migration due to the extraordinarily low wage dispersion in an international context.

on internal migration in Sweden over the period 1967–2003. It is organized around the investigation of the following research questions: To what extent do labour market indicators like wages and unemployment play a role in explaining internal migration in Sweden? Did the equalization of wages during the time of the solidarity wage policy really make wages unimportant for the migration decision?

Sweden is known in the international community for its compressed wage structure. Nevertheless, it has comparably high rates of internal migration. Except for economic equality, Sweden is a country of sharp differences: 51% of the population lives in three regions, which account for 70% of the national output growth (OECD, 2010). This demographic concentration is accompanied by a climatically harsh and dark north that contrasts the living conditions in the south and industry-intensive regions that stand against very rural communities (Borgegård et al., 1995; Martí-Henneberg, 2005). These mixtures of high economic equality on the one hand and extraordinary differences on the other make Sweden an interesting investigation case.

Comparing previous studies that try to find correlations between labour market indicators and migration on the macro-level, the methodology raises doubts. An econometric model that includes variables for migration, wages and employment has to deal with problems like endogeneity, non-stationarity and autocorrelation to give an accurate estimation. Since in none of the earlier investigations were all the concerns taken into account, the aim of the paper is to prove whether the results are still consistent if an appropriate and modern estimation technique is applied. A generalized method of moments (GMM) estimation using a dynamic panel data set that is similar in the variable definitions and model set-up to recent research shows that when using a usual OLS approach, wages are quite meaningless. Controlling for dynamics and endogeneity, however, wages turn into a significant impact factor on migration. Besides wages and employment possibilities (vacancies and unemployment rates), demographical and geographical factors are controlled. Although the data limitations usually linked to a macro-study need to be taken into account and some form of measurement error cannot be excluded (such as differing compositions of migrants with an increasing share of students, varying household constellations, employment status and other individual characteristics), the results of this exercise are threefold. First, they suggest that the wage differences in the manufacturing sector correlate with the gross internal migration and therefore the findings are in contrast to earlier research, concluding that Sweden is exceptional with regard to internal migration. As the examined time period (1967–2003) lies within a time of decreasing wage inequality under the solidarity wage policy, it is further estimated whether these results hold true only for the time after the break-up of the agreement between LO

and SAF.¹⁶ Second, it can be shown that the results are constant over time and not an outcome of the slight increase in wage inequality that emerged after the break-up of the solidarity wage policy. Another development that was uncovered, which emerged over time, is the decreasing migration with increasing female labour force participation rates. While women acted as tied movers earlier, nowadays migration has become a family decision with the consequence that migration has become more expensive and difficult for a family.

6.2 German stagnation versus Swedish progression: gender wage gaps in comparison, 1960–2006

A topic in the field of wage inequality that enjoys a large amount of public interest is the development of the gender wage gap. Though known and judged to be socially unacceptable for many years, countries perform quite differently in closing the gap. While the first paper took a purely Swedish view, the topic of gender pay gaps can gain many insights from a comparative analysis.

In the focus of this article are two countries that most readers would expect to be rather similar: Germany and Sweden.¹⁷ Indeed, they are similar in terms of the economic development or the provision of a social safety net. When it comes to the development of the gender wage gap for the years 1960–2006, however, these two countries form the couple of the often-claimed role model of gender equality (Sweden) and the rear guard of European nations in terms of equal pay (West Germany). In 1960, when West Germany had recovered from the Second World War, the gender wage gap lay at comparative levels in the two countries, i.e. 30% in Sweden and 34% in West Germany. In the following years, Sweden reduced the gap remarkably to 10% in the industrial sector as of 2006. Germany, in contrast, still manifests a gap of 25% in the same sector and as of the same year. The research question that follows from this observation is what are the factors that have led to the closing of the gap in Sweden and why has the gap in Germany stagnated by comparison? To answer this question, a multiple analysis is performed covering market factors such as human capital, demand and supply and occupational segregation, as well as political regulations. In addition to these two pillars, which usually appear in research, this paper will discuss a third pillar, one that becomes visible only when looking through a comparative lens: norms and traditions.

16 SAF: Swedish employers' confederation; LO: Swedish Trade Union Confederation.

17 The macro-analysis of this article refers to West Germany only as studies have shown deep cultural differences between West and East Germany.

Using different data sources that cover macro-developments of the economy, control for micro-differences in for instance human capital and show different cultural conceptions, the analysis uncovers the true differences between Germany and Sweden that lock the German gender wage gap. The analysis with individual data show that human capital, experience and other attributes influence male and female earnings somewhat differently in the two countries. Furthermore, an Oaxaca decomposition reveals that the pure investigation of individual factors leaves some parts of the gap unexplained. The comparison of political regulation and market forces leads to the conclusion that the main difference does not lie exclusively in hard facts but rather in soft factors, such as norms and traditions. The predominant attitudes concerning women's role in society differ and these attitudes penetrate institutional settings such as systems of taxation and the welfare state. Finally, the results suggest that the interaction of factors from politics, the economy as well as norms and traditions contribute to the formation of a German dilemma. This dilemma describes the interaction of less developed public child care, the German tax code and prevailing ideologies that all prevent mothers from engaging in full-time employment. All this leads to a loss of working experience and hence lower wages. Institutional changes alone, like separate taxation, would not help West Germany achieve gender equality in pay as long as the family policies are rooted in conservative ideologies.

6.3 Unlocking the social trap: Inequality, trust and the Scandinavian welfare state (with Svante Prado)

In their paper about family income inequality, Björklund and Palme (2000) present a very equal income distribution in Sweden during the 1980s, though claiming that Swedish equality is a historical inheritance from a long time ago. Accordingly, the question of when Sweden achieved this well-known equality remains unanswered. Hence, the first aim of the paper is to uncover the evolution of inequality. Using existent empirics on income distribution and adding new estimates based on market incomes, we can see a true equality revolution taking place in the 1930s and 1940s, whereby the assumption that Sweden has always been equal can be disproved (Rothstein & Uslander, 2005). Second, we link the equality development to the emergence of the welfare state as the former is often seen as an outcome of the latter. The relationship between equality and the welfare state constitutes a prominent research question. Peter Lindert (2009) uncovers a Robin Hood paradox, stating that unequal countries that are in need of redistribution redistribute much less than equal societies. Espuelas (2011) explains this by an “inequality trap”,

which prevents unequal countries from building up a welfare state. If inequality hampers a welfare state, does equality promote it? If so, does this apply to every kind of welfare state?

This essay detects the timing of the Swedish equality revolution and thereby shows that equality predates the Scandinavian welfare state. After proving the temporal sequence of an inequality drop and the establishment of the welfare state, we take Espuelas's (2011) idea of a trap further and try to explain how this was unlocked in Scandinavia. On our way to finding a mechanism that links inequality and the welfare state together, we find that trust is a factor that facilitates the implementation of social policies aiming at redistribution. It has been proved that trust and inequality are negatively correlated (Jordahl, 2009; Rothstein, 2009; Uslaner, 2002). In the case of high inequality and low trust, faith in a working state apparatus is not existent and hence the willingness to pay taxes is low. This does not, however, necessarily apply to all kinds of welfare states. Instead, what we would like to stress is that the combination of universal and generous benefits in the Scandinavian welfare state increases the risk of free-riding and thus creates a social trap. A social trap is defined as a situation in which – owing to a lack of trust – individuals act independently, although joint benefits through cooperation would exceed individual benefits. Public policies that would bring about equality do not gain support because trust is lacking (Rothstein & Uslaner, 2005).

For the Swedish case and quite briefly for the Scandinavian countries, we could show that inequality declined before any universal welfare state was launched. These results disprove any consideration of the welfare state as an institution that primarily serves to establish equality and add important temporal evidence on the discussion about the high level of equality for which Sweden is well known today. Second, we suggest that increasing trust as a consequence of decreasing inequality was a key factor in unlocking the social trap that eventually made the Scandinavian welfare state possible. We bring support to this dynamic view of rising trust levels before the rise of the welfare state in the 1950s by epitomizing two institutional and political developments – the march toward peaceful settings in the labour markets in the 1930s, manifested above all through the Saltsjöbad accord, and the coalitions between the Social Democrats and the Peasant Party – which illustrates the interplay among inequality, institutions and trust.

6.4 Winning ugly? The impact of wage inequality on labour productivity

Paper four takes a broader approach and compares wage inequality in 12 European countries, the US and Australia, estimating the impact on labour productivity for the period 1970–2006. While studies on inequality's impact on overall growth are manifold, this essay contains a novel analysis by setting inter-industry wage differences in relation to labour productivity. It complements more general studies on growth as well as micro-studies using firm data and fills this gap in productivity research.

Beginning in 1970, the article starts within a period in which the “Golden Age” was over. Comparing the period 1962–73 with the period 1973–82, the average growth rate per worker fell between 50–75% in Europe (Eichengreen, 2007:p.252). Eichengreen (2007) explains this, *inter alia*, with wages that increased faster than productivity. Besides a productivity slowdown, this time was characterized by falling employment rates in Europe, though rising employment in the US (Nickell, 1997). Some authors claim that the increase in unemployment in Europe dates back to common institutional roots emerging in the post-oil crisis era (Allard & Lindert, 2007) and call the rising unemployment in Europe the flip side of the rising inequality in the US. While researchers mainly focus on explaining one or the other, this paper tries to uncover the impact of inter-industry wage inequality on labour productivity, including how far this effect works through the channel of employment.

Since historical research on productivity growth is often described as a race between Europe and the US, this article examines whether a group of countries accepts an increase in wage inequality (i.e. “winning ugly”) to boost productivity in order to assess whether it is beneficial to follow the theme “grow now, redistribute later” (Klasen, 1994) or whether productivity growth can be increased by well-balanced wage structures. Running a 2SLS approach, the research question is twofold. First, what is the impact of inter-industry inequality on productivity and through which mechanisms? Second, does this impact differ between different groups of countries?

There are some country-specific studies estimating the effect of inter-industry inequality on productivity, such as Borjas and Ramey (1994) for the US or Hibbs and Locking (2000) for Sweden. Panel studies are few (like Rogers & Vernon, 2002) and hardly control directly for inequality while trying to explain productivity growth. Allard and Lindert (2007), for instance, show how the welfare state and labour market institutions affect productivity in OECD countries in 1963–1995, without explicitly referring to wage inequality. Enflo (2011) mentions the slightly positive impact of labour unions on productivity, without taking the next step and considering wage equality in

particular. The paper at hand expands Allard and Lindert's (2007) or Enflo's (2011) approach by incorporating inequality and secondly by uncovering differences between Europe on the one hand and Australia and the US on the other.

At least three convincing arguments exist to explain why inter-industry inequality might have an impact on productivity. First, the structural change argument in endogenous growth theory argues that squeezing pay differentials between industries can enhance productive efficiency by distributing labour and capital from low- to high-productivity activities (Agell & Lommerud, 1993; Borjas & Ramey, 1994). Consequently, less productive firms will be forced out of the market and the aggregate productivity will increase since productive firms have more resources available (Hibbs & Locking, 2000). Higher wage compression further limits disproportionate rewards, wasteful investments and misallocation of resources (Frank & Cook, 1995). Second, human capital investments are stimulated as with a decreasing number of low-skill jobs the alternative would be unemployment (Agell & Lommerud, 1993; Agell & Lommerud, 1997). Third, higher wage equality creates trust in society (Jordahl, 2009), cuts the costs of monitoring workers (Krueger & Summers, 1988; Shapiro & Stiglitz, 1984) and facilitates stable macro-policy (Allard & Lindert, 2007; Voitchovsky, 2009).

The theoretical relationship between wage inequality and labour productivity on a macro-level is tested empirically by Hibbs and Locking (2000) for the Swedish case. They conclude that the decreasing inter-industry wage differentials could partly explain the Scandinavian success story following the Second World War. This paper gives further evidence that this was not a purely Swedish scenario. The results of a 2SLS estimation indicate that wage inequality is negatively correlated with labour productivity and hence hampers growth in Europe, though not in the US and Australia. It further proves that the negative effect of inequality on productivity in Europe is mainly channelled through the inequality–employment nexus, which intensifies the employment–productivity trade-off. In the US and Australia, the impact is less clear-cut, though it cautiously suggests a positive impact of inequality on productivity. These results from a macro-perspective complement micro-studies that investigate the impact of intra-industry inequality with reasoning about cohesiveness and motivation effects.

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SAMMANFATTNING

Sammanfattning på svenska

Denna avhandling fokuserar på den specifika form av ojämlikhet som lönespridningen utgör och försöker belysa några olika typer av lönespridning och konsekvenserna av dem. Avhandlingen består av fyra separata uppsatser med lönespridning som gemensamt tema och har skrivits inom ämnet arbetsmarknadsekonomisk historia med stark empirisk inriktning. För att vi ska kunna förstå drivkrafterna bakom ekonomisk ojämlikhet och de långsiktiga konsekvenserna för samhället måste vi studera ojämlikhetens utveckling över tid genom att belysa dessa frågor i ett historiskt perspektiv. Avhandlingen inleds med en metodologisk diskussion om problemen med att ta fram tillförlitliga indikatorer för att kunna påvisa graden av ojämlikhet och dra slutsatser om utvecklingen. Därefter följer en diskussion om löner som den centrala variabeln och en översikt över historiska lönedata. En kortfattad översikt över ojämlikhetsforskningen ges för att visa hur denna avhandling förhåller sig till det bredare ämnet arbetsmarknadsekonomisk historia. Före de fyra uppsatserna presenteras empirisk bevisning för att ge läsaren en kvantitativ uppfattning om ekonomisk ojämlikhet.

I **den första uppsatsen** görs en skattning av vilka effekter den regionala lönespridningen har för den interna migrationen. Eftersom löneskillnaderna mellan olika län i Sverige är exceptionellt små drar många forskare på detta område slutsatsen att den interna migrationen i Sverige kan förklaras med hänvisning till skillnader i sysselsättningsmöjligheter snarare än i löner (Westerlund, 1998; Westerlund, 1997; Heibron, 1998; Dribe, 1994; Westerlund, 2006). En sådan slutsats ifrågasätts i denna uppsats genom att ny empirisk bevisning för de makroekonomiska faktorerna för intern migration i Sverige under perioden 1967–2003 presenteras. Uppsatsen bygger på följande frågeställningar: I vilken utsträckning kan sådana arbetsmarknadsindikatorer som löner och arbetslöshet användas för att förklara intern migration i Sverige? Innebar löneutjämningen under den solidariska lönepolitikens tid verkligen att lönen blev en oviktig faktor vid ett migrationsbeslut? En skattning med hjälp av den generaliserade momentmetoden (GMM) med dynamiska paneldata som med avseende på variabeldefinition och modellutformning ligger i linje med aktuell forskning visar att lönen är en betydelselös faktor när en gängse OLS-analys görs. Efter justering för dynamik och endogenitet framträder dock löneskillnaderna mellan länen som en signifikant faktor för migration. Förutom lön och sysselsättningsmöjligheter (lediga tjänster och

arbetslöshet) kontrolleras även för demografiska och geografiska faktorer. Med reservation för sådana databegränsningar som brukar hänga samman med en makrostudie och för att vissa typer av mätfel inte kan uteslutas (t.ex. förändrade migrantpopulationer med en allt större andel studerande, skillnader i hushållens sammansättning, sysselsättningsstatus och andra individuella egenskaper) kan tre slutsatser dras av resultaten. För det första tyder resultaten på att lönespridningen inom tillverkningssektorn korrelerar med den interna bruttomigrationen, något som går stick i stäv med tidigare forskning där man menar att Sverige är exceptionellt när det gäller intern migration. För det andra kan det påvisas att resultaten är konstanta över tid och inte en konsekvens av den något ökade lönespridning som följt på den solidariska lönepolitikens upplösning. En annan utvecklingstrend som framträder över tid är att migrationen minskar med kvinnors ökade delaktighet på arbetsmarknaden. Kvinnor har tidigare varit medflyttare (*tied movers*), medan en flytt i dag är ett familjebeslut och migration därmed har blivit ett både dyrare och svårare alternativ för en familj.

I uppsats två anläggs ett komparativt perspektiv för att försöka förklara hur det kommer sig att lönegapet mellan kvinnor och män har minskat påtagligt i Sverige, medan det i Tyskland i princip har förblivit konstant. Tyskland och Sverige uppvisar ganska stora likheter i termer av ekonomisk utveckling och sociala skyddsnet. När det gäller utvecklingen för lönegapet mellan könen under åren 1960–2006 beskrivs emellertid dessa två länder ofta som ett motsatspar, där det ena hålls fram som en förebild för jämställdhet mellan kvinnor och män (Sverige) och det andra som eftersläntraren bland de europeiska länderna när det gäller jämställda löner (Västtyskland). Lönegapet mellan kvinnor och män låg 1960 på ungefär samma nivå i de båda länderna: 30 % i Sverige och 34 % i Västtyskland. Sedan dess har gapet minskat markant i Sverige och låg 2006 på 10 % inom industrisektorn. I Tyskland däremot låg gapet samma år fortfarande på 25 % för samma sektor. Den fråga som inställer sig är vilka faktorer det är som har gjort att lönegapet har minskat så i Sverige medan det i Tyskland i stället har permanentats. För att kunna besvara denna fråga görs en multipelanalys som omfattar dels marknadsfaktorer, t.ex. humankapital, tillgång och efterfrågan och arbetsmarknads-segregering, dels politisk reglering. Förutom dessa två typer av faktorer, som är vanliga i forskningssammanhang, innehåller uppsatsen även en diskussion om en tredje typ som endast framträder vid ett komparativt perspektiv, nämligen normer och traditioner. Analysen av mikrodata visar att humankapital, erfarenhet och andra attribut påverkar mäns och kvinnors inkomster på något olika sätt i de två länderna. En Oaxaca-dekomponering visar dessutom att det inte räcker att endast undersöka enskilda faktorer för att förklara alla aspekter av lönegapet. En jämförelse av politisk reglering och marknadskrafter ger vid

handen att den största skillnaden inte endast ligger i hårda fakta, utan snarare i sådana mjukare faktorer som normer och traditioner. Rådande attityder om kvinnors roll i samhället varierar, och attityderna gör sig även gällande i sådana institutionella arrangemang som skattesystem och välfärdssamhället. Resultaten tyder även på att interaktionen mellan politiska och ekonomiska faktorer och faktorer som rör normer och traditioner bidrar till det tyska dilemman. Detta dilemma kan beskrivas som en interaktion mellan en svagare utvecklad offentlig barnomsorg, det tyska skattesystemet och rådande värderingar – faktorer som tillsammans försvårar för mödrar att arbeta heltid. Sammantaget innebär detta förlorad arbetslivserfarenhet och därmed lägre lön. Institutionella förändringar, t.ex. särbeskattnig, skulle inte i sig räckt för att skapa jämställdhet mellan könen i Tyskland så länge som familjepolitiken grundar sig på konservativa värderingar.

I **uppsats tre** ges en omfattande empirisk översikt över lönespridningens utveckling i Sverige under 1900-talet, och kopplingar görs mellan denna utveckling och välfärdsstatens framväxt. Genom att använda befintliga empiriska inkomstfördelningsdata tillsammans med nya skattningar baserade på marknadsinkomster kan vi se hur en veritabel jämlikhetsrevolution sker på 1930- och 40-talen, något som omkullkastar idén om att Sverige alltid har varit ett jämlikt samhälle (Rothstein & Uslander, 2005). En koppling görs dessutom mellan jämlikhetsutvecklingen och välfärdsstatens framväxt eftersom den förra ofta ses som en följd av den senare. Efter att ha presenterat bevis för det temporala förhållandet mellan minskad ojämlikhet och välfärdssamhällets etablering vidareutvecklar vi Espuelas (2011) idé om jämlikhetsfällan, dvs. antagandet att ojämlikhet hämmar välfärdssamhällets framväxt, och försöker förklara hur denna utveckling sett ut i de nordiska länderna. I samband med vårt arbete för att hitta en mekanism som länkar samman ojämlikhet och välfärdssamhället har vi kommit fram till att tillit är en faktor som underlättar genomförandet av socialpolitiska omfördelningsåtgärder. Belägg finns för en negativ korrelation mellan tillit och ojämlikhet (Rothstein, 2009; Uslander, 2002; Jordahl, 2009). Vi vill understryka att den nordiska välfärdsstatens kombination av universella och generösa förmåner innebär ökad risk för ett snålskjutsbeteende och skapar därmed en social fälla. En social fälla definieras som en situation där enskilda individer – på grund av bristande tillit – agerar för egen räkning, trots att ett samarbete skulle ge gemensamma fördelar som överstiger de individuella fördelarna. När det gäller Sverige, och kortfattat även de nordiska länderna i stort, har vi kunnat visa att ojämlikheten började minska redan innan något välfärdssamhälle för alla hade börjat införas. Dessa resultat motbevisar varje idé om välfärdssamhället som i första hand en institution för att skapa jämlikhet och bidrar med ytterligare viktig historisk bevisning till debatten om den höga jämlikhetsnivå

som Sverige är så känt för i dag. Vi föreslår dessutom att ökad tillit som en konsekvens av minskad ojämlikhet utgjort den nyckelfaktor som undanröjt risken för den sociala fällan och därmed gjort den nordiska välfärdsstaten möjlig. Vi lägger fram stöd för en sådan dynamisk syn på tillit som en faktor som ökade redan innan välfärdsstatens framväxt på 1950-talet genom att beskriva två institutionella och politiska utvecklingstrender som visar på samspillet mellan ojämlikhet, institutioner och tillit: utvecklingen i riktning mot fredliga lösningar på arbetsmarknaden under 1930-talet, som framför allt tog sig uttryck i Saltsjöbadsavtalet, och koalitionen mellan Socialdemokraterna och Bondeförbundet.

I **uppsats fyra** anläggs ett bredare perspektiv, löneskillnaderna i tolv europeiska länder samt USA och Australien jämförs och en skattning av effekterna för arbetsproduktiviteten görs för perioden 1970–2006. Mot bakgrund av att produktivitetstillväxten i ett historiskt perspektiv i forskningen ofta beskrivs som en kapplöpning mellan Europa och USA undersöks i denna uppsats huruvida en grupp länder är beredda att acceptera ökad lönespridning i utbyte mot ökad produktivitet ("winning ugly"), för att man ska kunna fastställa om det är fördelaktigt att följa principen "tillväxt först – omfördelning senare" (Klasen, 1994) eller om ökad produktivitetstillväxt kan uppnås med hjälp av utjämnade lönestrukturer. En skattning enligt 2SLS-metoden görs och två frågeställningar framträder. Den första frågan gäller hur lönespridningen mellan olika branscher påverkar produktiviteten och vilka mekanismer som styr detta. För det andra ställs frågan om denna påverkan skiljer sig åt mellan olika ländergrupper. Det finns åtminstone tre övertygande argument till stöd för att en lönespridning mellan olika branscher skulle påverka produktiviteten. För det första innebär argumentet om strukturell förändring inom teorin för endogen tillväxt att en sammanpressning av lönespridningen mellan olika branscher kan ge ökad produktionseffektivitet genom att arbete och kapital omfördelas från låg- till högproduktivetsverksamheter (Agell & Lommerud, 1993; Borjas & Ramey, 1994). Detta innebär att företag med lägre produktivitet kommer att tvingas bort från marknaden och att den sammanlagda produktiviteten kommer att öka eftersom produktiva företag har bättre tillgång till resurser (Hibbs & Locking, 2000). För det andra stimuleras investeringar i humankapital eftersom alternativet till ett minskat antal lågkvalificerade arbetstillfällen skulle vara arbetslöshet (Agell & Lommerud, 1993; Agell & Lommerud, 1997). För det tredje ger ökad lönemässig jämlikhet ökad tillit till samhället (Jordahl, 2009), minskade kostnader för övervakning av arbetstagare (Shapiro & Stiglitz, 1984; Krueger & Summers, 1988) och främjar en stabil makropolitik (Allard & Lindert, 2007; Voitchovsky, 2009). Den teoretiska kopplingen mellan lönespridning och arbetsproduktivitet på makronivå i Sverige har undersökts empiriskt av Hibbs och Locking (2000).

De drar slutsatsen att minskad lönespridning mellan olika branscher utgör en del av förklaringen till den svenska framgångssagan efter andra världskriget. I denna uppsats presenteras ytterligare belegg för att detta inte bara varit en svensk företeelse. Resultatet från en skattning enligt 2SLS-metoden tyder på en negativ korrelation mellan lönespridning och arbetsproduktivitet och att lönespridning således hämmar tillväxten i EU, men inte i USA och Australien. I uppsatsen visas även att den negativa effekt som lönespridning har på produktiviteten i EU framför allt kanaliseras via kopplingen mellan ojämlikhet och sysselsättning, vilket leder till att avvägningen mellan sysselsättning och produktivitet skärps. I USA och Australien är påverkan inte lika entydig, men det finns det som försiktigtvis tyder på att lönespridningen har positiv effekt på produktiviteten.

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