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German stagnation vs. Swedish progression: gender wage gaps in comparison, 1960–2006

Abstract

This article provides a comparative analysis of the development of the gender wage gap in West Germany and Sweden during the period 1960–2006. Despite the economic similarities including broad social safety nets, the gap has developed differently since 1960. This analysis accounts for micro- and macroeconomic factors and politics and concludes that norms and traditions penetrate institutional settings and ensnare Germany in a cultural trap with regard to gender equality. While Sweden has moved to a two-earner model, German society expects mothers to stay at home. The micro analysis shows that family concerns (e.g., marriage and motherhood) decrease female income in Germany to a far greater extent than do such factors in Sweden, which can be explained in part by deeply held social attitudes.

Keywords: Culture, gender wage gap, Germany, Sweden, welfare state

JEL classification: N34, J16, I38, J31, Z1

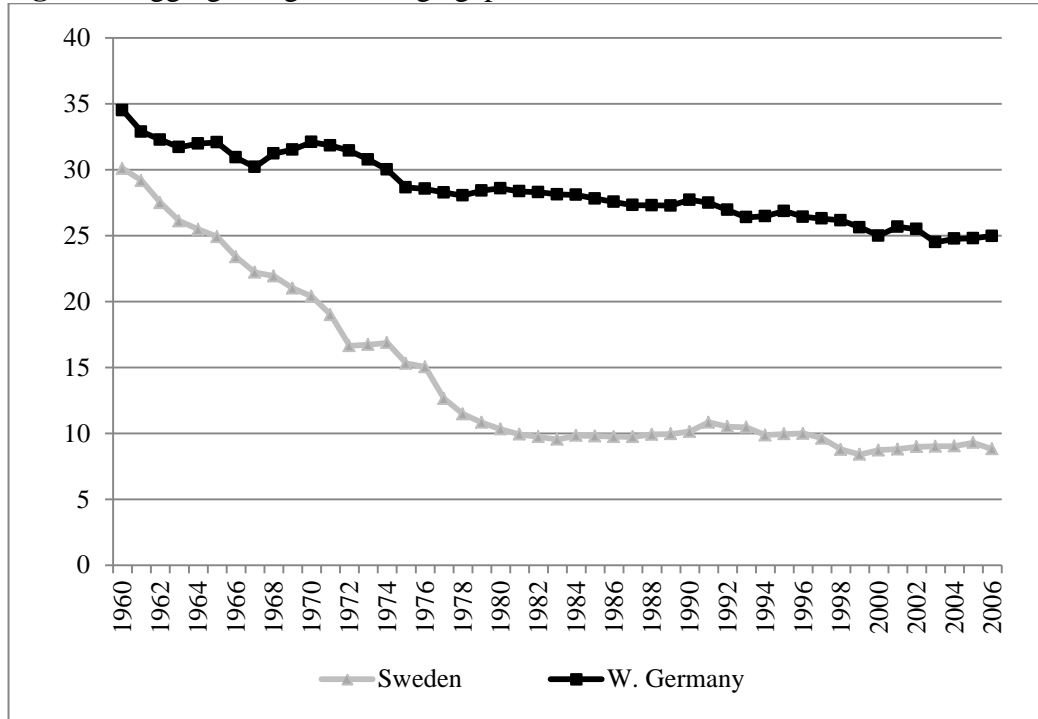
1. Introduction

On average, the gender wage gap in Europe has decreased during the post-war period. West Germany and Sweden, however, comprise two outstanding examples: The comparison of these two countries illustrates a confrontation of an often-claimed model of gender equality (Sweden) and the rear guard of European nations in terms of equal pay (West Germany). The long-term development of the gender wage gap in the industrial sector appears as is shown in Figure 1. The investigation begins with data from 1960 and is confined to the period after which West Germany has recovered from the Second World War.¹ At that time, the wage gap was virtually identical in both countries—30% in Sweden, 34% in West Germany. In the following decades, Sweden succeeded in closing the gap to a remarkable extent, while the situation in West Germany has

¹ The decision to limit the macro analysis of this investigation to West Germany is due to the fact that studies have shown deep cultural differences between West and East Germany. Including data from both contexts following their reunification in 1990 would equate to the inclusion of a third and distinct country, at least in a cultural sense.

been essentially stagnant: as of 2006, the unadjusted gender wage gap for the industrial sector was around 25% in Germany as compared to only 10% in Sweden.

Figure 1 Aggregated gender wage gap of the industrial sector



Note: The gap is calculated as $(1 - \text{wage}_{\text{female}} / \text{wage}_{\text{male}}) * 100$. In order to take into account differences in working hours and the impact of the tax system, estimates are based on the gross hourly earnings. The ratios exclude overtime pay, bonuses and other perks since men are more likely to have access to these “extras” as well as a higher number of working hours (Lips, 'Concrete indicator' (2003), p88). The series do not account for occupational or human capital differences.

Sources: Sweden: HILD 1960-1990, 1990-2006 ILO; West Germany: Statistisches Bundesamt; whole industry sector

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? The existing literature has often focused on market factors such as human capital, demand and supply and occupational segregation, as well as on political regulations. This paper will discuss a third pillar, one that becomes visible only when looking through a comparative lens: norms and traditions.

The investigation uses a variety of data and combines quantitative with qualitative methods to uncover the impact of each pillar. Using individual data from the Luxembourg Income Study, the analysis begins with a traditional microeconomic comparison of the wage gap in both countries as of 2004/5. The regressions show that human capital, experience and other attributes

influence male and female earnings somewhat differently in the two countries. Though a portion of the observed gap remains unexplained, this analysis will be carried further, by undertaking a macroeconomic analysis of the remaining variables, rather than citing them as discrimination. 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 analysis of the European Value Survey and Hofstede's masculinity index suggests that the predominant attitudes concerning women's role in society differ and that these attitudes penetrate institutional settings such as systems of taxation and the welfare state. The signals to the market that emanate from these norms and traditions have not received sufficient attention in recent research. Comparisons of two countries that are equal across multiple dimensions is a possibility of uncovering the impact of such factors, which often go overlooked in studies that consider only a single country or in multi-country studies. The results suggest that the interaction of factors from politics, the economy as well as norms and traditions contribute to the forming of a German dilemma. Less developed public child care prevents mothers from full-time employment, while part-time work is impeded by the German tax code. Prevailing ideologies further advocate in favour of stay-at home motherhood, which leads to the valuable loss of working experience. Sweden, by comparison, has freed itself via social attitudes that support working mothers, which can be seen in the country's political regulations, tax code and social safety net.

2. Previous Research

2.1 Sweden

The numerous studies of gender wage inequality can be divided into bodies of research that have focused on either economic factors or institutional ones. Comparative studies are in relation to this few, and even fewer is the number that have sought to compare the former West Germany with Sweden. Starting with country-specific microeconomic studies in Sweden that have attempted to explain the gap by individual characteristics in terms of human capital, experience, etc., Edin and Richardson, for instance, argued that changes in industry wage differentials have worked against women, while the impact of human capital factors has favoured the reduction of the wage gap. They related their findings to the impact of the solidarity wage policy on gender

inequality and stressed its importance in the Swedish context.² Grand investigated the wage gap with regard to four explanations: women's responsibility for family and household, human capital, compensating wage differentials between men and women and job segregation.³ The study, which used Swedish register data, showed that job segregation explained a sizeable percentage of the gender wage gap as of 1981. From a macroeconomic perspective, most research has dealt with either economic developments or institutional changes. In a long-term study, Svensson concluded that, despite the rapid narrowing of the gender wage gap that had occurred contemporary to the solidarity wage policy, excess demand for female labour was the main driving force. Institutions were important during the interwar years but, according to Svensson, market forces were the main driving factors after 1960.⁴ In this, Svensson stands in contrast to the micro-analytical study of Edin and Richardson, as well as the macro-analytical study of Gustafsson and Löfström. The latter investigated particular policy changes and ascribed them a certain impact.⁵ Kjelstad also focused on institutions in the Nordic countries in general;⁶ he concluded that these countries possessed a longer and stronger tradition of institutional arrangements stimulating gender equality.

2.2 Germany

Studies in a German context have shown a general focus on the impact of children and related wages over the life-cycle. Rosenfeld and colleagues, for instance, performed a micro-analytical study of the impact of children on income in which they compared West and East Germany.⁷ Hannan et al. conducted a cohort analysis to investigate the educational payoff in different career stages. The authors were not able to find a positive, significant educational payoff for women over time, therefore concluding that there was the existence of a glass ceiling.⁸ Kunze used a similar approach, focusing on early-career wage gaps and the effect on wages of having a first

² Edin/Richardson, 'Swimming with the tide' (2002), 50.

³ Grand, 'Job Segregation' (1991).

⁴ Svensson, 'Explaining equalization' (2003), Svensson, 'Closing the gender gap' (1995), Svensson, 'Politics or market forces' (1996).

⁵ Gustafsson/Löfström, 'Policy changes' (1991).

⁶ Kjelstad, 'Gender Policies' (2001).

⁷ Rosenfeld et al., 'Before and after reunification' (2004), Trappe/Rosenfeld, 'How do children matter' (2000).

⁸ Hannan et al., 'Sex and sector differences' (1990).

child.⁹ In her 2005 paper, Kunze concluded that gender-based segregation in terms of occupational qualifications explained a significant percentage of the persisting wage gap and led to a permanent wage disadvantage for women. Fitzenberger and Wunderlich offered one of the few long-term analyses of the wage gap in West Germany, in which they considered data from the period 1975–1995.¹⁰ They concluded that life-cycle wage growth is far less for females compared to males. Hinz and Gartner showed that, for the period 1993–2001, occupational segregation played a minor role as the wage gap turned out to be comparatively high even when controlling for occupation and enterprise.¹¹

From a macroeconomic perspective, Ostner offered a diverging approach that focused on ideas, traditions and institutions in West Germany, which she compared to data from the German Democratic Republic.¹² In her macro-level analysis, she highlighted the differences in employment status and the impact of social policies on families and the division of labour but did not provide any analysis of equality in earnings. The impact of laws and regulations on the gender wage gap in Germany has not been analysed.

2.3 Comparative studies

Comparing investigations undertaken at an international comparative level leads to a confrontation of two explanatory approaches. First, a group of researchers, which includes scholars such as Blau, Kahn, Mandel and Semyonov, ascribes diverging gender gaps to the country-specific wage structure. Mandel and Semyonov concluded that the lower earnings differentials between men and women in developed welfare states should be attributed to their more egalitarian wage structures rather than to their family policies.¹³ Family policies and institutions are the secondary explanation, represented—for instance, by Waldfogel, who suggested that maternity leave, along with other family-oriented policies, could be an effective remedy for the gender wage gap.¹⁴ Gustaffson investigated another institutional impact by seeking to compare the tax systems in West Germany and Sweden, respectively, and identifying

⁹ Kunze, 'Determination of Wages' (2000), Kunze, 'Early Career Gender Wage' (2002), Kunze, 'Entry Wages' (2003), Kunze, 'Evolution of the gender wage' (2005), Kunze/Ejrnaes, 'Wage Dips and Drops' (2004).

¹⁰ Fitzenberger/Wunderlich, 'Gender wage differences in West Germany' (2002).

¹¹ Hinz/Gartner, 'Lohnunterschiede' (2005).

¹² Ostner, 'Slow motion' (1993).

¹³ Blau/Kahn, 'The gender earnings gap' (1992), Mandel/Semyonov, 'Family policies and gender gaps' (2005).

¹⁴ Waldfogel, 'Understanding the "family gap"' (1998).

both a meaningful difference in the tax codes as well as the fact that children might act as a deterrent to female labour force participation in West Germany.¹⁵

One study that comes close to the approach adopted here is that of van der Lippe et al.¹⁶ The authors combined micro- and macro-analytical approaches in considering data from 17 countries during the period 1965–1998. They analysed the impact of economic circumstances, policies and culture on employment rather than on wage differences and concluded that institutional conditions are important in bringing women into the labour force. With respect to culture, it appears that well-educated, married women in masculine cultures do less paid work. The present study will allow us to determine whether a deeper analysis of only two countries—a so-called masculine state and a feminine state—will support these results in the case of the wage gap.¹⁷

3. Alternative theoretical explanations

As the literature review has shown, most past studies have dealt with country-specific issues that cannot explain divergent developments across countries. It is noticeable that most of the research conducted in a German context has focused on wages over the life-cycle and found a distinctive wage penalty for women. What is missing thus far is an explanation for this pattern. This section will provide a theoretical background as to how the welfare state and cultural norms might differently influence men and women's wages.

According to Esping-Andersen's categorisation of welfare states, West Germany can best be described as a conservative welfare state system, in which family policies are the prerogative of the family. The Swedish system, in contrast, has extensive public family policies, supports dual-earner families and can be classified as a social-democratic welfare state.¹⁸ Such classifications have been criticized for not having considered a gender-based perspective. The welfare system is expected to have a considerable impact on the decisions of females to participate in the labour force and thus on wages. Furthermore, the social welfare system communicates values.

¹⁵ Gustafsson, 'Separate taxation' (1992).

¹⁶ van der Lippe et al., 'Persistent inequalities' (2011), van der Lippe/van Dijk, 'Comparative research' (2002).

¹⁷ Hofstede, '*Masculinity and femininity*' (1998).

¹⁸ Esping-Andersen, '*Welfare capitalism*' (1990), van der Lippe/van Dijk, 'Comparative research' (2002), 226.

Korpi developed a new typology based on institutional structures and their impact on the distribution of paid and unpaid work.¹⁹ Starting from the concept of a male breadwinner, Korpi distinguished three types of welfare state models: dual-earner support, general family support and market-oriented policies.²⁰ A dual-earner model encourages female participation in the labour force, as well as the redistribution of social care work in society and within the family. The German context reflects one in which general support is given to the nuclear family, presuming a traditional, gendered division of labour in both society and the family. Indicators of this are, for instance, the provisioning of only half-day child care, which assumes the presence of a stay-at-home mother. As empirical proof, Korpi selected variables such as public day care for children younger than two, paid maternity leave and public home help provided to the elderly. Korpi's rankings of countries according to their levels of general family and dual-earner support brought into focus clear differences: In terms of general *family* support, West Germany ranked second during the period 1985–1990, whereas in terms of *dual-earner* support, Sweden ranked first during the same period.²¹ Korpi also noted that the major actors are not only political parties but also churches and other social movements. Advocacy-focused confessional parties in continental Europe—many of which are related to Catholicism—seek to maintain the traditional family structure as the moral basis for a good society.

A range of authors, including Duncan, Lewis, Pfau-Effinger and Budig et al., have adopted an approach similar to Korpi's.²² Lewis categorised countries as strong, modified and weak breadwinner states. Sweden in this framework serves as an example of the weak breadwinner model. This has not always been the case but can be seen to be a result of the events of the 1960s and 1970s, supported by separate taxation, parental leave and day care provisioning. West Germany, on the other hand, is an example of the strong breadwinner model. One indicator of this is the large number of non-working mothers with children who are too young for schooling,²³ which is related to the low level of child care provisioning. Furthermore, male breadwinner states draw a line between public and private responsibility, which translates to a motherhood penalty.²⁴

¹⁹ Korpi, 'Faces of inequality' (2000).

²⁰ See also Lewis, 'Gender welfare regimes' (1992).

²¹ Korpi, 'Faces of inequality' (2000), 142–148.

²² Budig et al., 'Motherhood Penalty' (2010), Duncan, 'Gender Systems' (1995), Duncan/Edwards, 'Lone Mothers' (1997), Lewis, 'Gender welfare regimes' (1992), Pfau-Effinger, 'Gender cultures' (1998).

²³ Lewis/Ostner, 'European social policies' (1994), 19f, 27f.

²⁴ The motherhood penalty is calculated to be of 50% in West Germany and 16% or less in contemporary Sweden. Joshi/Davies, 'Day care' (1992).

Pfau-Effinger found that women are more likely to be dependents and housewives in West Germany, earning only supplementary income through part-time work. She explained these differences by referring to the complex interplay of gender culture and institutions.²⁵ Duncan and Edwards expanded the same factors that Korpi attempted to quantify by considering the impact of confessional parties into 'gendered moral rationalities'.²⁶ These are additional constraints placed on a rational decision maker that thereby influence the decision maker's understanding of what is morally right and socially acceptable.²⁷

Budig et al. found that motherhood penalties are lesser when cultural attitudes support maternal employment. Policies and attitudes cannot be separated, however; instead, they reinforce one another. That is why similar policies can have divergent outcomes in different national contexts.²⁸

4. Micro-economic analysis

4.1 Data

To eliminate differences that stem from human capital and from individual factors, a classic micro-economic analysis will first be undertaken. This will show whether characteristics such as experience, children or education differently affect the income for males and females in the respective countries. Using data from the Luxembourg Income Study (LIS),²⁹ the well-established Mincer wage equation will be estimated.³⁰ The data provide individual information for several waves since 1984. This microanalysis will be restricted to Wave VI, which was conducted in 2004 in Germany and 2005 in Sweden, for reasons related to data availability and comparability.³¹ Before considering the differences in the gender wage gap, some descriptive evidence is provided for the year 2004/5.

²⁵ Pfau-Effinger, 'Gender cultures' (1998).

²⁶ Korpi, 'Faces of inequality' (2000), 139.

²⁷ Duncan/Edwards, 'Lone Mothers' (1997), 29.

²⁸ Budig et al., 'Motherhood Penalty' (2010), 4, Tabellini, 'Culture and Institution' (2006), 1.

²⁹ 'Luxembourg Income Study (LIS) Database'.

³⁰ Mincer, '*Schooling and Earnings*' (1974), chap. 5.

³¹ Some variables have different sub-categories (such as occupation), which weakens comparisons but nevertheless yield important insights (see App. 3).

Table 1 Earnings ratio by age and household composition (female/male)

	Age		
	20-24	25-49	50-54
Germany	0.98	0.62	0.61
Sweden	0.75	0.72	0.71
	Parent / Partner Status		
	partner/no child	partner/child	no partner/no child
Germany	0.74	0.38	0.88
Sweden	0.74	0.62	0.91
	Age of Youngest Child		
	no	<6	6-17
Germany	0.82	0.33	0.41
Sweden	0.83	0.54	0.68
	Number of Children < 18		
	1	2	3
Germany	0.47	0.34	0.26
Sweden	0.69	0.64	0.51

Source: LIS Employment Key Figures by Gender

Table 1 shows the earnings ratios according to different specifications. While younger German women (ages 20–24) earn almost as much as their male counterparts, this changes quickly by the time women reach typical child-bearing ages. This gap, once evident, is not seen to be reduced with time. Swedish women already face a gap of approximately 25% at an early age, which is fairly stable over their working lives.³² In Germany, child birth seems to be the important point of fracture: A woman with no partner and no child faces an earnings gap of approximately 12%, whereas a woman with a child will face a 36-percentage-point greater earnings gap. This trend of wider earnings gaps for mothers is also observed in Sweden, although it is far less extreme. The age and number of children can exacerbate these differences.³³

4.2 Regression analysis

The estimates of female/male earnings ratios given in the previous section do not control for individual differences, which will be done in a subsequent step. The regression equation follows

³² For a more in-depth discussion of gender-specific wages over the life course, see Gustafsson/Tasiran, 'Wages in Sweden' (1994).

³³ Budig et al., 'Motherhood Penalty' (2010), 20.

the well-established Mincer wage equation.³⁴ The log labour income Y of person i in country c may be specified as:

$$Y_{i,c} = c + X_{i,c}\beta_c + e_{i,c} \quad (1)$$

where $X_{i,c}$ is the vector of human capital and other individual characteristics, including marital status, number of children, weeks worked, work experience and education, β_c is the vector of parameters to be estimated and $e_{i,c}$ is a random error. Marital status is defined as a dummy variable, one in the case of marriage and zero otherwise.³⁵ The education variable takes a value from one to six and refers to the highest level of education completed in a country-specific format. The regression will be performed under industry- and occupational-fixed effects, separate for men and women in the industrial sector (see App. 1 for summary statistics of the data). Because the Swedish data do not include part-time work, both regressions were made for permanent employees without the possibility to control for working hours.³⁶ The dependent variable is the log labour income and, to display the comparative impact of the variables, the beta coefficients are calculated as well.³⁷

³⁴ Mincer, '*Schooling and Earnings*' (1974).

³⁵ Separated, divorced and widowed statuses are omitted.

³⁶ Permanent employed status is in contrast to people with short-term employment or those who work without a contract. Since working weeks gives no information about half- or full-time employment, the coefficient for children could be downwardly biased and those for experience and weeks worked upwardly biased.

³⁷ Beta coefficients are estimated by using standardised variables, also called z-scores. These variables are calculated by subtracting off its mean and dividing it by its standard deviation. The beta coefficients show the standard deviation change of the dependent variable given a one standard deviation change in an independent variable. By this they allow comparisons between coefficients (Wooldridge, '*Econometrics*' (2003), 185f, 485).

Table 2 Regression results and Oaxaca decomposition

	Sweden				Germany			
	Female		Male		Female		Male	
	Level	Beta	Level	Beta	Level	Beta	Level	Beta
Marital	-0.035 (0.0247)	-0.025	0.066*** (0.0171)	0.067	-0.3*** (0.0364)	-0.178	0.088*** (0.0266)	0.061
No. of children	-0.098*** (0.0114)	-0.162	-0.0093 (0.0075)	-0.021	-0.08*** (0.0157)	-0.108	0.03*** (0.0092)	0.057
Education	0.069*** (0.0137)	0.117	0.084*** (0.0086)	0.198	0.128*** (0.0111)	0.244	0.1149*** (0.007)	0.285
Experience	0.05*** (0.004)	0.837	0.018*** (0.003)	0.434	0.047*** (0.0054)	0.587	0.026*** (0.0037)	0.461
Experience sq	0.0008*** (0.0001)	-0.639	-0.00027*** (0.0001)	-0.317	-0.00084*** (0.0001)	-0.391	-0.00042*** (8.07E-05v)	-0.329
Weeks	0.011*** (0.0029)	0.067	0.014*** (0.0017)	0.128	0.0226*** (0.0019)	0.213	0.031*** (0.0017)	0.275
Constant	10.53*** (0.1733)	.	11.148*** (0.0958)	.	8.41*** (0.0127)	.	8.37*** (0.0944)	.
N	3133		3315		2169		2883	
Oaxaca decomposition								
Log income	12.46		12.65		10.22		10.59	
Gap	0.19				0.367			
Explained	0.009 (4.5%)				0.098 (26.6%)			
Unexplained	0.185 (95.5%)				0.27 (73.4%)			

Note: Standard errors are given in parentheses. Fixed-effect regression controlling for industries and occupations, LIS data wave VI. References for the Oaxaca decomposition method: Oaxaca ‘Wage Differentials’ (1973); Jann ‘Blinder-Oaxaca Decomposition’ (2008).

***Statistically significant at the 1% level; **statistically significant at the 5% level; * statistically significant at the 10% level.

In case of marriage, German women suffer a significant wage loss while men in both countries realize a 6–9% marriage gain. In both countries there exists a comparable motherhood penalty of 8%–9%, while men, in contrast, benefit in their earnings as a result of being fathers and husbands, at least in the German context. Table 1 showed a sharp fall in relative female earnings in case of childbirth in Germany. The regression results in Table 2 indicate a comparative motherhood penalty. In addition, the regression brings forward a child bonus for men that is only existent in Germany and can partially explain the wage drift in case of parenthood. A second explanation is the strong correlation between marriage and motherhood in Germany, where more than 80% of child births occur after marriage (Figure 4). The motherhood penalty increases

dramatically (50%) in the case that one does not control for marriage in Germany but rises only to 12% in the case of Sweden (see App. 2). Differences also can be identified with regard to educational pay-off. Education seems to be more important in Germany than in Sweden. Experience shows an inverted, U-shaped impact course on income, as could be expected from prevailing theory. In both countries, work experience has a greater impact on pay for women. As we will see, this is a clear problem because this is the factor in which mothers are most lacking. The standardised regression coefficients illustrate the comparatively large impact of experience. Swedish women gain a lot more than their male counterparts from experience; but they lose with each child. In Germany, experience has the greatest impact, as well. Furthermore, education and, in a similar range, the number of weeks worked increases women's income. Leaving out marital status, the results are confirmed.³⁸ While the wages of Swedish females are very much dependent on experience, the impact factors are more equally distributed in the German case. While children have almost no impact on male earnings, the negative impact on females' incomes is comparatively high. This applies for both countries.

The next question is to what extent are these factors able to explain the earnings gap. Using the same regression model, the explainable part of the gap is isolated with the Blinder-Oaxaca decomposition method (Table 2).³⁹ The mean of the log incomes is 10.59 for German men and 10.22 for German women, yielding a gap of 0.37. Adjusting women's endowment levels to the levels of men would increase female earnings by 7%. A gap of 30% remains unexplained in the German context. Sweden, where workers enjoy a generally higher average income, has a gap equivalent to 0.19, which is lower than that in Germany; 23% of the gap remains unexplained, however, since the endowments have a negative effect.

Though these results should be regarded with suspicion, they further confirm the broader gender gap in Germany compared to Sweden and, in addition, that much of the gap cannot be explained only by individual characteristics. The data unfortunately suffers from a lack of information on hours worked, different information about part-time work and refers to dissimilarly-aggregated industries. The micro-level analysis nevertheless has revealed that factors

³⁸ Binary variables cannot be compared in beta coefficients. Kohler/Kreuter, *'Data Analysis'* (2005), 197.

³⁹ Since many women work part-time, a variable that cannot be controlled for here, all incomes less than half of the mean have been dropped to reduce the upward bias of the gap. This explains the difference in the log income compared to the constant.

such as marriage, children, education and weeks worked have differential impacts in the two countries and that other factors, that are not controlled for here, play a major role.

5. Politics

When market mechanisms fail to achieve a certain outcome, the state is often required to intervene, as happened in both Sweden and West Germany. However, a closer look reveals that the gender-based laws and regulations not only differ in quantity but more so in quality.

Although some gender-based laws can be identified in the history of West Germany, doubt can be cast on their outcomes. It is notable that the impetus for policy change has often come from external pressure. In 1945, it was the United Nations (UN) that required the nation to convey respect to all peoples regardless of gender. The Equal Rights Act (ERA) was only accepted in 1949 under public pressure (Basic Constitutional Law (GG), article 3).⁴⁰ The *Equal Pay for Equal Work Act* was implemented in 1956. In 1980, women's right to receive pay equal to men was written into German civil law, as was the convention of equal treatment in the place of employment. The law that abolished all forms of gender discrimination was decided in the UN in 1979 but was only enacted in West Germany in 1985.⁴¹ A look at the available data in Figure 1 suggests that none of the regulations led to a breakthrough in terms of gender equality. The changes in the wage gap are too smooth to be linked to any one political intervention. The Federation of German Trade Unions (DGB) supports this finding by their criticism that regulations only existed in written format but were not applied in reality.⁴²

In Sweden, policy changes comparable to those instituted in West Germany were pursued. Sweden is also a member of the UN and therefore was party to the Convention on the Elimination of all Forms of Discrimination against Women (CEDAW). Gustafsson and Löfström have investigated the impacts of four national policy changes.⁴³ First, the abolishment of separate

⁴⁰ Article 3 GG (Grundgesetz):

- (1) Alle Menschen sind vor dem Gesetz gleich.
- (2) Männer und Frauen sind gleichberechtigt.
- (3) Niemand darf wegen seines Geschlechts, seiner Abstammung, seiner Rasse, seiner Anschauungen benachteiligt oder bevorzugt werden.

⁴¹ Handelskammer, 'Chronik der Frauenrechte'.

⁴² Drohsel, 'Lohndiskriminierung' (1986).

⁴³ Gustafsson/Löfström, 'Policy changes' (1991).

tariffs had been agreed upon between the Swedish employers' confederation (SAF) and the Swedish Trade Union Confederation (LO) in 1960, which were comparable to regulations enacted in West Germany in 1956 and 1980.⁴⁴ The negotiating partners recommended equal pay for equal work in different branches, which was part of the solidarity wage policy and was not initially intended to narrow the gender wage gap.⁴⁵ Nevertheless, the heyday of the solidarity wage policy can be traced to the 1960s and 1970s, the same period during which the gender wage gap saw the most marked narrowing.⁴⁶ The timing of the downturn of these trends (beginning in the 1980s) co-varies with the breakup of the system of coordinated, centralised negotiation. However, Svensson has argued that the trend had emerged as early as 1961, even though no such policy had been implemented prior to 1962.⁴⁷

Second, Sweden lifted its ban on night work by women in industrial contexts in 1962; a similar ban was lifted in West Germany 30 years later, in 1992. Third, in 1971, Sweden undertook what was likely the most important change, giving wives a stronger economic incentive to work by instituting the policy of separate taxation for spouses. In comparison, West Germany agreed in the 1970s that women may work without the husband's permission, a clear arrear compared to Sweden. Fourth, an agreement on equal opportunity was decided upon in Sweden in 1977.

Gustafsson and Löfström concluded that half of the change in the gender wage gap could be attributed to policies.⁴⁸ Svensson, on the other hand, claimed that the observed labour market changes can also have their impetus in other events that occurred at the same time.⁴⁹ Whether there was an effect at all is illustrated in Table 3. The Chow test, which tests for structural breaks, indicates significant change occurred in 1962 and 1977 in the case of Sweden.⁵⁰ The German laws enacted in 1980 and 1985, on the other hand, did not lead to a break in the time series.

⁴⁴ SAF: *Svenska Arbetsgivareföreningen*, LO: *Fackorganisationen Landsorganisationen i Sverige*.

⁴⁵ Stanfors, 'A study of women' (2003), 51.

⁴⁶ Edin/Holmlund, 'Wage Structure' (1995).

⁴⁷ Svensson, 'Closing the gender gap' (1995), 128.

⁴⁸ Gustafsson/Löfström, 'Policy changes' (1991), 328.

⁴⁹ Svensson, 'Closing the gender gap' (1995), 130.

⁵⁰ Stock, 'Unit roots' (1994).

Table 3 Tests for structural breaks

Sweden	1959	1962	1971	1977	W. Germany	1980	1985
p-value	0.447	0.007	0.246	0.0178	p-value	0.443	0.277
F	0.59	5.44***	1.45	4.52**	F	0.83	1.32

Note: The gap is regressed on the lagged gap, a dummy for the year in which the regulation was implemented, and an interaction variable of the gap time of the lagged dummy variable. The corresponding equation is given by $gap_i = L.gap_i + Law + L.Law * gap_i + e$

***Statistically significant at the 1% level; **statistically significant at the 5% level; * statistically significant at the 10% level.

Labour unions are an additional political player, whose impact is related to the fight for the reduction of any gender wage gap. Even though no quantitative difference is observable, a qualitative difference can be said to exist between the two countries. The comparatively large wage gap can be seen as a consequence of the introduction of the so-called *Leichtlohngruppen* in West Germany. These wage groups were created to avoid particular female wages in 1955 but instead came to be a substitution for them. Originally, the new laws were designed to prevent females from being paid differently than men. However, the construction of the wage groups had the opposite effect. *Leichtlohngruppen* were applied to jobs that did not require heavy body work and that were mainly done by women. Since wage discrimination by gender was prohibited, the type of work—i.e., its difficulty and the effort required—was used to set the wage level. The rating, done by bargaining partners, valued the sub-requirements of a job—such as the mental and physical requirements, the attendant responsibilities and the work conditions—using a point scale. The scale was criticised for assigning a disproportionate valuation to physical labour. As a result, the wage groups that covered 84% of employed women were at the very bottom of the wage scale, below even unskilled work.⁵¹

In sum, the gap was relatively stable and persistent in West Germany, a pattern that does not speak in favour of the importance of policy changes. Most political change in West Germany was instigated, to some extent, by external pressure and did not correspond to the prevailing attitudes and discussions occurring in society. If norms and traditions do not correspond with a change toward gender equality, the same laws and regulations will lead to different outcomes in terms of equal pay. The same institutions can function differently depending on cultural traits, as culture influences individual behaviour.⁵²

⁵¹ For more information, see Drohsel, 'Lohndiskriminierung' (1986), 141-145,151,208.

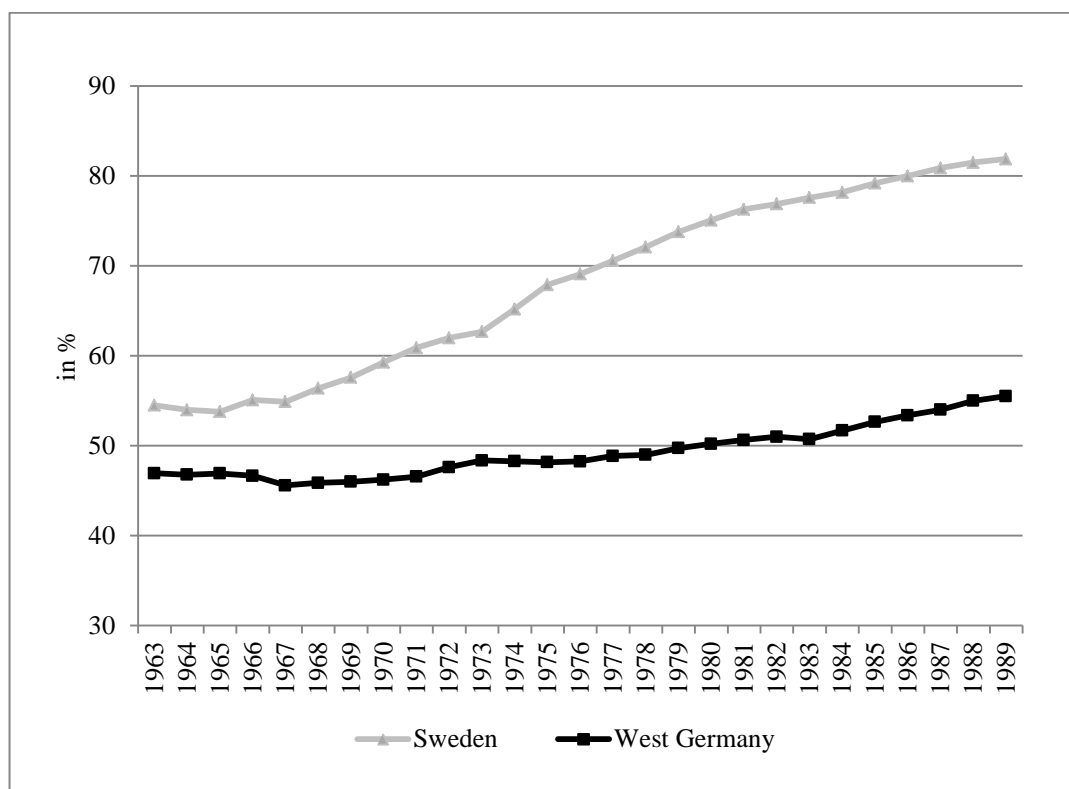
⁵² Tabellini, 'Culture and Institution' (2006), 1, Akerlof/Kranton, 'Identity' (2000).

6. Macroeconomic factors

6.1 Labour force participation

Drohse ascribed to female work a 'buffer function', with women entering the work force if no other labour is available and with their consequent employment being more dependent on the business cycle than male participation.⁵³ This holds true for both West Germany and Sweden early in the period considered here. In Sweden, the norms have changed, while in West Germany there has been continued difficulty in adjusting to the ordinariness of female labour force participation. Despite the very low unemployment in West Germany in the 1960s, there was no significant increase in the rate of female labour force participation.

Figure 2 Female labour force participation (in %)

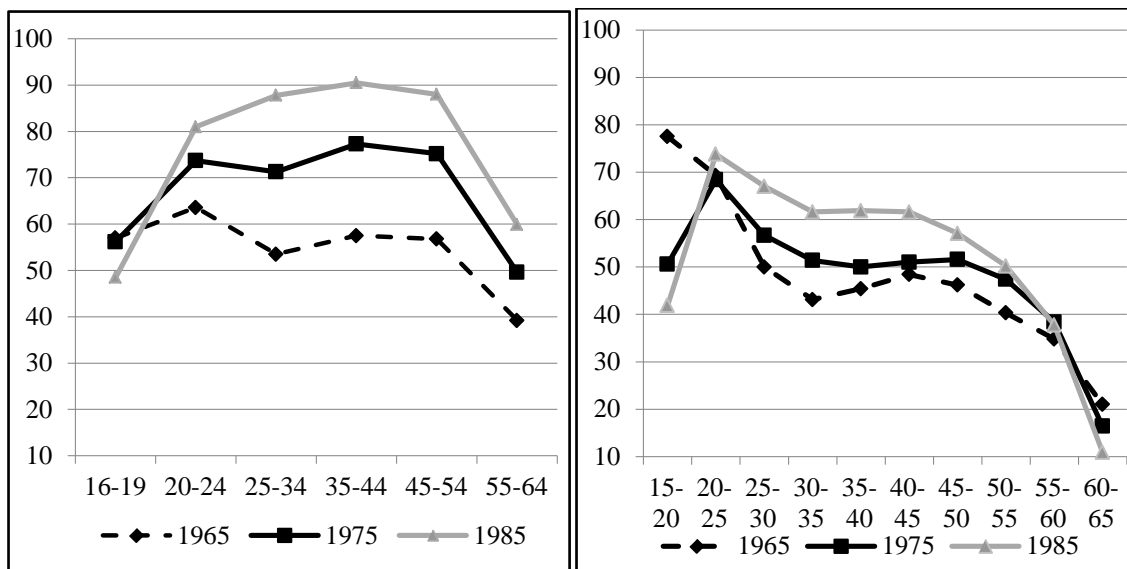


Note: The graph ends in 1990 since after reunification female labour force participation is given for the whole Federal Republic including the Eastern part, which historically has higher female labour force participation.
Source: Gustfasson (1992), World Bank

⁵³ Drohse, 'Lohndiskriminierung' (1986), 159.

The female labour force participation rate for the two countries began at a more or less equal level in 1963, from which point it increased steadily in Sweden, whereas it showed only halting increases in West Germany. By the close of the 1980s, there was a difference of almost 30 percentage points in the rate of female labour force participation in Sweden as compared to West Germany. The market sets important incentives but sometimes market incentives are not sufficient if the predominant attitudes in a society are opposed to female participation in the labour force as values themselves can motivate action.⁵⁴

Figure 3 Age-specific female labor force participation in Sweden and West Germany (in %)



Sources: West Germany: Engstler and Menning (2004); Sweden: Stanfors (2003)

The lines plotted in Figure 3 show the participation rates of women grouped by age in 1965, 1975 and 1985, respectively. While the differences in female labour force participation at a young age (until 20–25) were less pronounced, German women tended to drop out of the labour force with age. A similar trend can be observed in Sweden in 1965 and 1975, when public child care and working mothers were both less common. Nevertheless, even early on, the age-related decline of female participation was much smoother than that measured for contemporary West Germany. There, as late as 1985, one could assume that child-bearing forced women out of the labour market while in Sweden the rate of female labour force participation increased

⁵⁴ Schwartz, 'Mapping' (1999), Licht et al., 'Culture rules' (2007), 663.

continuously up to the age of 55. Furthermore, decade by decade, progress can be seen in Sweden; progress in West Germany, on the other hand, has been comparatively little. Over the three decades, the highest rate of female labour force participation in West Germany occurred among women aged 20–25. When women reach typical child-bearing age they cease to participate in the labour market, or at least more than in Sweden. These results support the results of the microeconomic analysis in which one could suppose that women dropped out of the labour market in the cases of marriage and motherhood. The microeconomic analysis has also revealed that work experience has a higher payoff for women than it does for men. Consequently, the incompatibility or undesired combination of career and family hits even harder. This is a functional chain that reinforces itself and, can explain a part of the large difference between West Germany and Sweden.

6.2 Tax code

The tax code has special import for female labour force participation and reveals an incisive difference between West Germany and Sweden.⁵⁵ The tax code is not just a system imposed by an exogenous entity; it is something that develops over time and displays, communicates or regulates society's prevailing attitudes and values. This claim is supported by Greif who argues that the organisation of a society reflects common cultural beliefs.⁵⁶

The tax codes in Sweden and West Germany are both progressive but the crucial point is the introduction of separate taxation in Sweden in 1971, whereas German women are confronted with high marginal tax rates as a result of split taxation. In West Germany, the taxable earnings of both partners are added together and, on the basis of half of the total earnings, the income tax is computed by applying the tax function. This amount is then doubled to determine the total tax amount (see App 4).⁵⁷ Spouses can choose whether both are taxed at the same rate or if they will split their incomes across two different rates. This is advantageous when one spouse earns more than the other, which is usually the case (the so-called splitting advantage). The primary breadwinner is then taxed according to a lower tax bracket, while the secondary wage earner is placed in a higher tax bracket. The German wife has to earn a lot to offset the splitting advantage

⁵⁵ Gustafsson, 'Separate taxation' (1992).

⁵⁶ Greif, 'Cultural Beliefs' (1994), 915, see also Nee/Ingram, 'Embeddedness' (1998), 22.

⁵⁷ Steiner/Wrohlich, 'Income Splitting' (2004), Gottfried/Witczak, 'Das Ehegattensplitting' (2006).

before she contributes to the family's overall income.⁵⁸ In the Swedish system, tax rates depend only on the individual's income. Such a system encourages part-time work over a life as a housewife.⁵⁹ That the rate of women's labour force participation had already begun to increase slightly earlier than the instituting of the reform can be explained by politics that had adapted to a change that was already on-going in society.

7. The impact of norms and traditions

7.1 Measuring cultural differences⁶⁰

After investigating the economic, political and institutional forces, it is suggested that cultural norms make the decisive difference in explaining the divergent development of the gender wage gap between Sweden and West Germany. As this paper has attempted to show, the German view on the compatibility of family and work differs markedly from the Swedish view. This is on the one hand caused by the welfare state system while, on the other hand, it is reinforced by the predominant ideologies that legitimise policies.⁶¹ Institutions reflect norms and traditions. At the same time, norms and traditions affect individual behaviour by defining what is desirable and accepted.⁶² This section will attempt to approximate cultural differences through the use of three indicators: Hofstede's masculinity index (MAS),⁶³ the European Values Survey (EVS) and the number of births that occurred outside of marriage.

The cultural difference is confirmed by Hofstede's MAS, which produces a score that ranges between 0 and 100. The higher the score, the more the values are attached to masculine standards and the less associated they are with a good work-life balance.⁶⁴ In a study performed over the years 1967–1973, West Germany ranked ninth, with 66 points out of 100; Sweden, on the other hand, ranked 53rd, with a MAS score of five. Masculine countries are typified by

⁵⁸ Gustafsson, 'Separate taxation' (1992), 69ff.

⁵⁹ Svensson, 'Closing the gender gap' (1995), 115.

⁶⁰ Culture is here defined as norms, traditions and ideologies, as well as prevailing attitudes within a society.

⁶¹ Pfau-Effinger, 'Cultural change' (2008), 188.

⁶² Schwartz, 'Mapping' (1999), Licht et al., 'Culture rules' (2007).

⁶³ Hofstede, '*Masculinity and femininity*' (1998).

⁶⁴ van der Lippe et al., 'Persistent inequalities' (2011), 171.

women who are expected to be tender and to foster relationships, whereas such expectations apply to both men and women in feminine societies.⁶⁵

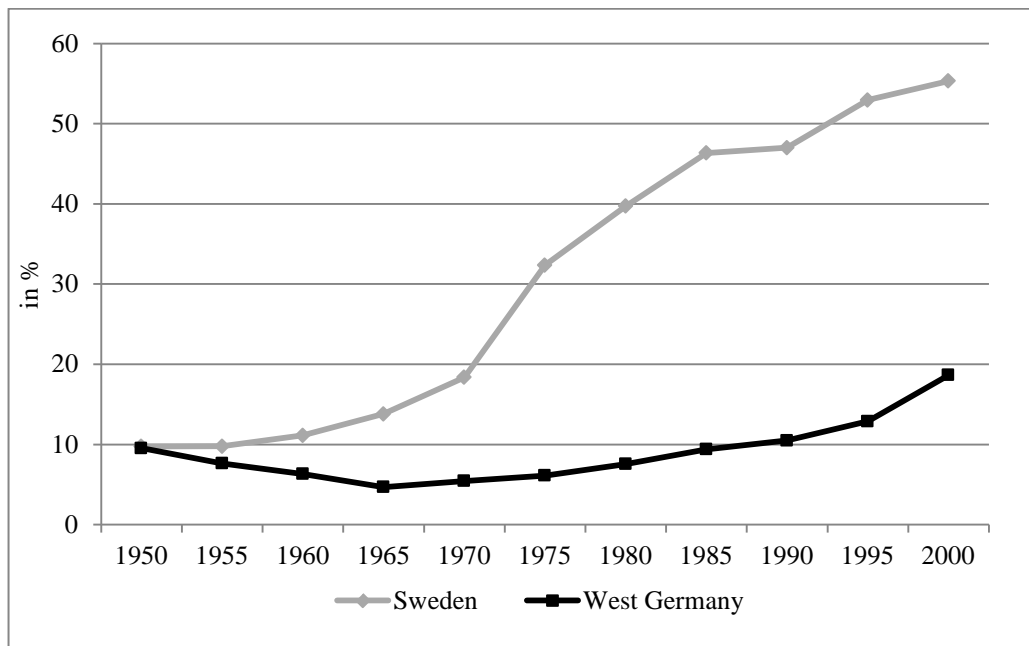
This difference in attitudes also has been confirmed by the EVS of 1990, in which people were asked whether they agree with the statement that ‘a working mother can establish just as warm and secure a relationship with her children as a mother who does not work’. Nearly 45% of the Swedish sample replied that they ‘strongly agree’, whereas fewer than 10% of respondents in the West German sample responded in a similar manner. If ‘strongly agree’ and ‘agree’ were to be added together, as well as ‘strongly disagree’ and ‘disagree’, the picture becomes even clearer—71% of respondents in Sweden agreed with the above statement while the majority of respondents in West Germany—54%—disagreed.

Unfortunately, it is not possible to compare responses to an EVS from the 1950s with responses to more recent iterations of the survey in order to investigate whether Sweden and West Germany held different attitudes from the start or if Sweden has developed into a country with more “modern” values in recent decades, as has been suggested by Lewis and Ostner as well as Leira.⁶⁶ Other indicators, such as the number of reported births outside of marriage, provide hints and are available over a longer period of time.

⁶⁵ Hofstede, *Masculinity and femininity* (1998), 9–17.

⁶⁶ Lewis/Ostner, *European social policies* (1994), 27, Leira, *The woman-friendly welfare state?* (1993), 57.

Figure 4 Births outside of marriage (in % of all births)



Note: In Sweden from 1975 the data not only distinguish married versus unmarried birth, but also count births by widows and the divorced.

Source: Statistical Yearbooks for West Germany and Sweden.

Figure 4 shows how the number of births outside of marriage has increased in Sweden since the 1960s. The German data is very stable, only edging over 10 per cent in 1990. Interestingly, the rates of such births for the two countries were virtually identical in 1950. A development—a release from conservative values—occurred in Sweden at some point in the 1960s. By 1990, almost half of all children were born outside of marriage. This is a broad indicator that shows that West Germany retained its conservative values, which encompassed many beliefs, including those pertaining to births outside of marriage and toward working mothers. Perhaps the increased number of births outside of marriage in West Germany, in combination with the increase in female labour force participation since the end of the 1990s, is indicative of a slight change driven by Germany's reunification.

7.2 Why norms (did not) change(ed)

Some authors have claimed that norms and traditions are not path dependent and have changed in Sweden.⁶⁷ When and why did these changes occur and, particularly, why has the cultural transformation been slow to occur in West Germany? The quantitative evidence about attitudes and female labor force participation supports the hypothesis that a change has taken place.

The divergent development can be explained by four factors. The first dates back to an earlier period in the countries' respective histories and refers to a different self-image of the two societies.⁶⁸ The cultural change, it is argued, was easier in Sweden because the country has, in general, a more open opinion toward gender equality and is known as a society of consensus.⁶⁹ A tradition of female work and female autonomy existed already around 1900, which was further supported by a comparatively weak male breadwinner model.⁷⁰ The years 1930–1950 can be seen as a break, wherein Sweden orientated itself more toward conservatism. During these years, the share of working women in the economy as a whole decreased.⁷¹ After the Second World War, however, the norms swiftly shifted.⁷²

A second reason why the family model with a housewife was challenged toward the end of the 1950s was active research into gender roles and the claim that all women should work outside of the home. A key difference appears here between West Germany and Sweden: In Sweden, each individual is responsible of their own economy, expected to be self-sustaining in order to be seen as a complete member of the society, independent of gender.⁷³ Berggren and Trägårdh argued that Swedes have a noticeably high degree of individualism. The large role played by the state in the welfare system serves to make each individual independent of the family, the employer or other organizations. The German system, in contrast, has been since its beginning interconnected with the family.⁷⁴

Third, changing attitudes in Sweden were further supported by a debate around feminism that differed from contemporary German debate on the same topic.⁷⁵ In West Germany, feminism was seen as a women's debate, whereas in Sweden it was understood to concern the entire

⁶⁷ Leira, 'The woman-friendly welfare state?' (1993), 57, Lewis/Ostner, 'European social policies' (1994), 27.

⁶⁸ Leira, 'The woman-friendly welfare state?' (1993), 57f.

⁶⁹ Florin/Nilsson, '*Jämställdhetens politisering*' (2000), 25.

⁷⁰ Klinth, 'Pappapolitiken' (2013), 236f.

⁷¹ Holmberg et al., '*Kynne eller kön*' (1966), 17.

⁷² Myrdal/Klein, '*Women's Two Roles*' (1968), 67.

⁷³ Florin/Nilsson, '*Jämställdhetens politisering*' (2000), 25f., 36.

⁷⁴ Berggren/Trägårdh, '*Människa*' (2006), 10f, 27, 40f, 52f, 66.

⁷⁵ Myrdal/Klein, '*Women's Two Roles*' (1968), 67.

society.⁷⁶ West German feminism was very reluctant to identify independence with employment.⁷⁷ While in Germany the opinion that small children suffer from not being cared for by their mother remains common, Sweden began to take men into responsibility. The reasons for the German reluctance can cautiously be dated back to the experiences of the Second World War, when many enforced separations of mothers and children occurred.⁷⁸ In Sweden, a new family model was demanded in which both spouses took equal responsibility for the care of their children.⁷⁹

A fourth reason why it took longer for gender roles to change in West Germany lies in the experiences of the Nazi era. During the immediate post-war years, family life played an important stabilizing role. Politicians of all parties agreed that a stable, well-integrated family was the best instrument in the effort to regain a sense of normalcy and to rebuild a democratic society. The family served as a bulwark against all forms of totalitarianism.⁸⁰ If women would have started a revolution as they had in Sweden, the private area of the family, which gave people security and kept them grounded, would be seen to be destroyed.

7.3 The German dilemma: Caught in a cultural trap

Family policies in West Germany have been designed to sustain the traditional family with a stay-at-home mother. This has been further underpinned by the German tax code, which tends to discourage dual-earner couples. This supports the overall impression that West German social policy has tended to treat women as wives and mothers, and men as breadwinners. Gender wages present this phenomenon as a 'child penalty' for women and a 'child bonus' for men.⁸¹ The high degrees of family support decrease the career opportunities available to women by reducing their work experience and on-the-job training.⁸² As the micro-level analysis has shown, work experience is especially important for women. A social safety net that offers only limited public child care worsens the situation for working mothers.

⁷⁶ Olsson, 'Jämställdheten' (2013), 198.

⁷⁷ Ostner, 'Slow motion' (1993), 94.

⁷⁸ Myrdal/Klein, 'Women's Two Roles' (1968), 124.

⁷⁹ Olsson, 'Jämställdheten' (2013), 196, 200.

⁸⁰ Ostner, 'Slow motion' (1993), 96-98.

⁸¹ Rosenfeld et al., 'Before and after reunification' (2004), Trappe/Rosenfeld, 'How do children matter' (2000).

⁸² Waldfogel, 'Understanding the "family gap"' (1998), 150.

The German welfare system relies upon traditional family roles that remain predominant among the population. Keeping this in mind, it is less surprising that the gender wage gap has been slow to narrow. In a society such as Sweden, in which working women have been the norm and there exists a social safety net that attempts to support female participation in the labour force, female labour is valued more highly—in part but not only because women have more work experience. The fight for equal wages has received increased public attention and has not been treated as a minor issue, as it long was in German politics. At the same time, Sweden should not be taken as a role model. Instead of judging one system as being superior to the other, the aim should be to show that different norms and traditions have a clear impact on the gender wage gap.

An example of how culture can impact the market can be seen in the German tax code, which rewards a single breadwinner, who is typically male. Even though maternity leave has been extended several times, access to pre-school and child care remain poor.⁸³ Here, the cultural norm that states that children younger than three should be cared for at home by their mother comes into play. This includes that working women often drop out of the labour market while pregnant, as the age-specific data on female labour force participation has shown. Even as recently as 1990, 38% of all 25–54 year-olds had a negative attitude concerning female employment; that figure was even higher—56%—for people 55–76 years of age. In Sweden, the comparable figure is only 18%.⁸⁴ This undermines the stereotype that, in combination with institutional factors such as the tax code and access to public child care, creates the type of cultural trap in which Germany has been caught for many years.

8. Conclusions

Compared to 1960, the gender wage gap was considerably higher in West Germany than it was in Sweden as of 2006. This investigation has tried to explain why West Germany missed out on the considerable progress toward gender equality that allowed Sweden to narrow this gap. The point of focus has been the question of whether the market dictates different wages or whether public policies have a significant impact on the size of the gap. This paper has shown that it is necessary

⁸³ In Germany, only 4.2% of children younger than three years have access to public child care (Hara, 'Fertility trends and family policies' (2003), 183).

⁸⁴ Korpi, 'Faces of inequality' (2000), 158-159.

but not sufficient to account for market and political forces. To explain the differential development that occurs between countries, the social safety net and traditional attitudes must not be omitted from consideration. Only the comparison of two seemingly similar countries—at least in economic terms—can illustrate how norms and traditions are able to influence the gender wage gap. Unfortunately, the way of data construction does not allow running a combined model that tests the micro versus the macro variables to quantify the comparative explanatory power of culture. What future research endeavour needs to composite is a reliable cultural measure that varies over time to address this issue.

From a political perspective, West Germany had ample opportunity to exert additional pressure in pursuit of gender equality, as was done in other European countries and as was demanded by European and international organisations. The resultant changes were written cautiously and thus performed weakly. Even though Sweden had a much more intense set of gender-related policies, the extent to which these regulations affected the gender wage gap has remained unclear. Reductions of the gap that have been achieved simultaneously with the passage of new laws can also be explained, in part, by contemporaneous market forces. It is further plausible that politics reacted to changes in the market and in the ideology of the population. The impact of new regulations depends on the extent to which those regulations reflect the society's attitudes.

From a market perspective, West Germany has had chances to increase female wages as an incentive to increase the rate of female labour force participation and as a way to overcome the labour shortages of the 1950s and 1960s. Prohibited by family policies and conservative ideologies, these chances were not taken. The problem can be described as an interaction of the different factors that has since led to the *German dilemma*: If mothers want to work, the underdeveloped state of public day care forces them to limit themselves to part-time work. Here, the disadvantage of the German tax code comes into effect. They earn only a small amount of marginal income after taxes, so that many decline to pursue work at all. If they stay at home, as they are encouraged to do by the way in which the social safety net is structured and by the prevailing attitudes in German society, they lose out on work experience, which further reduces their wages. Swedish public day care, on the other hand, makes it possible for women to re-enter the labour market quickly and thus not to lose out on as much work experience.

Swedish society has had added dynamics affecting its gender wage gap largely due to a competing ideology concerning female labour force participation, which has since been institutionalised in the social safety net and the Swedish tax code. West Germany, on the other hand, has continued to enact conservative family policies despite the social modernism. The lower rate of female labour force participation, mother-bound childcare and the cautious regulations all contribute to the fact that a full-time working mother is an exception. With this in mind, it is less surprising that females' wages differ dramatically in comparison to males' wages. Institutional changes alone, like separate taxation, would not help West Germany achieve gender equality in pay as long as family policies are rooted in conservative ideologies. The Swedish case shows that norms and traditions in a society can change. As gender equality has reappeared on the political agenda in recent times and the female labour force participation rate has slightly increased, Germany may yet free themselves of conservative ideologies so that they can finally follow the Swedish path.

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Appendix 1. Summary Statistics

	GERMANY				SWEDEN			
	Female		Male		Female		Male	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Employment	0.705	0.45	0.85	0.35	0.85	0.35	0.88	0.31
Marital	0.64	0.47	0.61	0.48	0.587	0.49	0.52	0.49
Log income	9.55	1.11	10.22	1.03	11.9	1.08	12.34	1.01
Age	39.22	13.08	39.74	12.82	41.65	11.75	42.09	11.89
Education	3.54	1.57	3.73	1.64	3.71	1.12	3.45	1.15
Experience	11.35	9.85	16.75	12.26	20.079	12.14	21.94	12.84
Permanent	0.47	0.49	0.61	0.48	0.72	0.44	0.71	0.45
Weeks	33.29	23.204	42.81	18.17	47.11	13.25	47.16	13.1
no. of children	0.93	1.035	1.00	1.05	1.09	1.11	1.03	1.12

Appendix 2. Regression Results

	Sweden				Germany			
	female		male		female		male	
	level	beta	level	beta	level	beta	level	beta
n. children	-0.1019*** (-0.011)	0.167	-0.000627 (-0.0072)	-0.001	-0.1401*** (-0.0144)	-0.181	0.0432*** (-0.0085)	0.079
education	0.0692*** (-0.0137)	0.117	0.08688*** (-0.0086)	0.204	0.1352*** (-0.0112)	0.258	0.1164*** (-0.007)	0.289
experience	0.05132*** (-0.0044)	0.825	0.01924*** (-0.003)	0.449	0.0356*** (-0.0053)	0.437	0.0297*** (-0.0036)	0.519
experience sq	-0.0008*** (-0.0001)	-0.638	-0.0003*** (-0.0001)	-0.299	-0.0007*** (-0.0001)	-0.311	-0.0005*** (-0.0001)	-0.359
weeks	0.01196*** (-0.0029)	0.068	0.01459*** (-0.0017)	0.129	0.0225*** (-0.0019)	0.212	0.03157*** (-0.0017)	0.277
cons	10.526*** (-0.1732)		11.1279*** (-0.096)		8.358*** (-0.1287)		8.372*** (-0.0946)	
N	3133		3315		2169		2883	

Note: Standard errors are given in parentheses. Fixed-effect regression controlling for industries and occupations, LIS data wave VI

***Statistically significant at the 1% level; **statistically significant at the 5% level; * statistically significant at the 10% level.

Appendix 3. Dummy variables for fixed effects

	Germany	Sweden
Industry	Agriculture, hunting, forestry	Agriculture, forestry and fishing
	Fishing	Mining and quarrying; manufacturing; utilities
	Mining and quarrying	Construction
	Manufacturing	Wholesale and retail trade; repairs; hotels and restaurants
	Electricity, gas, water supply	Transport, storage and communication
	Construction	Financial intermediation
	Wholesale and retail trade; repairs	Real estate, renting and business activities
	Hotels and restaurants	Public administration; education; health and social work
	Transport, storage and communication	Other community, social and personal services; household activities; extra-territorial
	Financial intermediation	
	Real estate, renting and business activities	
	Public administration and defence; compulsory social security	
	Education	
	Health and social work	
	Other community, social and personal service activities	
	Activities of private households as employers	
	Extra-territorial organizations and bodies	
Occupation	Managers	Leading position
	Professionals	High-level employee
	Technicians and associate professionals	Medium-level employed
	Clerical support workers	Lower-level 2 employee
	Service and sales workers	Lower-level 1 employee
	Skilled agricultural, forestry and fishery workers	Skilled worker in service production
	Craft and related trades workers	Skilled worker in goods production
	Plant and machine operators	Unskilled worker in services production
	Elementary occupations	Unskilled worker in goods production
	Armed forces occupations	

Appendix 4. Splitting versus separate taxation

Let Y_H be the husband's income and Y_W the wife's income. $t(\cdot)$ denotes the tax function and $T(\cdot)$ the income tax charged. In case of *separate taxation* the simplified calculation of the charged taxes would be

$$T(Y_H, Y_W) = t(Y_H) + t(Y_W).$$

Joint taxation leads to

$$T(Y_H, Y_W) = 2 * t[(Y_H + Y_W)/2].^{85}$$

Within *joint taxation*, the spouses can choose to split their monthly income tax in two different columns (III and V), with the spouse with higher earnings subsequently incorporated in column III and getting his/her own tax exempt amounts as well as the one of his/her spouse. The spouse integrated in class V has no tax exemptions and pays a higher monthly income tax.

⁸⁵ Steiner and Wrohlich, 'Income Splitting' (2004)