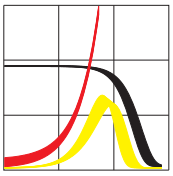

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Welfare State Context, Female Earnings and Childbearing

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Abstract: This paper investigates the role of female earnings in childbearing decisions in two very different European contexts. By applying event history techniques to German and Danish register data during 1981-2001, we demonstrate how female earnings relate to first, second and third birth rates. Our study shows that female earnings are rather positively associated with fertility in Denmark, while the relationship is the opposite in West Germany. We interpret our findings based on our observation that Danish social policies tend to encourage Danish women to become established in the labor market before having children, while German policies during the 1980s and 1990s were not designed to encourage maternal employment.

Keywords: Female Employment, Fertility, Welfare State Context

1 Introduction

In the not-so-distant past, female employment was viewed in the literature as a barrier to family formation. Underlying this view were the assumptions that childrearing and employment are incompatible, and that a gendered division of household activities can be expected to persist. According to this view, increases in female education, income and employment levels would be expected to result in lower fertility. Empirical studies of relationships during the 1960s and 1970s, when fertility in many countries declined in tandem with increasing female labor force participation rates, lent support to this hypothesis. The evidence was overwhelming, and for many scholars the negative correlation between female employment and fertility became a matter of fact (Spitze 1988: 606; Becker 1993: 140).

However, the idea that female employment is always a threat to reproduction has been disputed vigorously in more recent sociological and demographic literature. Proponents of comparative welfare state research have pointed out that policies that help mothers to combine work and family life in modern societies are also conducive to higher fertility (Bernhardt 1993; Rindfuss and Brewster 1996; McDonald 2000; Neyer 2003). Societies that support dual-earner families are most often more flexible and gender equal than male-breadwinner societies. Furthermore, the single-earner model has become a precarious family arrangement in times of growing labor market uncertainties and increasing family dissolution rates. Societies that support maternal employment seem better equipped to face the various

challenges posed by globalized economies than societies that support the role of mothers as housewives and caregivers (Esping-Andersen 1999; 2009).

These and many other considerations suggest that the welfare state shapes the conditions under which couples make their fertility decisions. How female employment affects reproductive choices depends on whether a woman is expected to be a caregiver, an earnings provider or both after childbirth. In male-breadwinner regimes, female employment or female earnings might be negatively related to fertility. In dual-earner societies, a sufficient female income may rather be a prerequisite for having children.

In this paper, we study how female earnings relate to fertility in the two very different welfare state contexts of Denmark and Germany. The two neighboring countries seem to be ideal test cases for studying how social policy contexts shape the association between female employment, earnings and fertility. While Denmark's family policies have gradually shifted towards supporting maternal employment since the 1970s and 1980s, Germany's family policies have continued to favor the housewife model. Given the contrasting welfare state setups, our main hypothesis is that female earnings support fertility transitions in Denmark, while they have the opposite impact in Germany. In order to test this hypothesis, we make use of large- scale Danish and German register data for the period 1981-2001. Since the demographic situation in the two parts of Germany is still very different, we will focus our attention on the western states of Germany, i.e., West Germany. Apart from differences by welfare state context, we also investigate how the earning-fertility nexus varies by birth order, period and age. The paper is structured as

follows. In Section 2 we develop our main hypotheses and provide a brief overview of the institutional framework of Denmark and Germany. In Section 3 we describe the data and methods, while in Section 4 we present the results of our event history analyses of the transitions to first, second and third births. Section 5 provides our conclusions.

2 The Income and Fertility Nexus

2.1 The income and fertility relationship in economic models

Because the relationship between income and fertility touches upon a core economic topic, a discussion of economic theory appears relevant when studying the earnings and fertility nexus. Inherent in economic thinking is the idea that income and fertility would be positively correlated, but that this correlation is overwritten by a "myriad" of confounding factors (Borg 1989: 301). The classical "confounder" in this context is child quality, which is assumed to increase disproportionally with family income (Becker 1960). With his concept of "child quality", Becker has provided an intuitive explanation of why previous studies had been unable to detect a positive relationship between income and fertility. However, for empirical researchers this framework was not useful because it is difficult to find an operational definition of child quality in empirical research.

Another aspect that is highlighted in economic thinking is the role of women's wages in childbearing decisions. Women's wages are usually approached via the opportunity cost argument. Based on the dual assumptions that work and family life

are not compatible, and assuming that women shoulder the lion's share of childrearing tasks, higher female wages may be expected to result in higher opportunity cost of childrearing, and, thus, in lower fertility. If it is further assumed that educational homogamy is high in most societies (Blossfeld und Timm 2003; Domanski and Przybysz 2007), not accounting for this counterbalancing impact of female wages on childbearing would bias any analysis of men's and women's income on fertility.

Classical economic thinking has been powerful in conceptualizing the role of female and male income in childbearing decisions, and it provides straightforward hypotheses on the income and fertility nexus. At the same time, this approach has been attacked for being inherently chauvinistic, given that it assumes a more or less naturally given gendered division of labor. In defense of the economic model, we must concede that economic bargaining theory deals with the division of household labor from a more dynamic gender perspective (Feiner et al. 1995). We should note, however, that economists have never seemed to be particularly interested in the question of how social context and social policy configuration affect gender equality and fertility.

2.2 Social policies and the income and fertility relationship

In related sociological research, employment and fertility behavior are commonly framed in terms of life-course decisions. Having a child is a central life-course event which is influenced by other domains in the life course (Elder 1985, Mayer and Tuma 1990; Giele et al. 1998; Willekens 1999). Attention is also drawn to welfare

state institutions and how they structure the modern life course (Mayer and Schöpflin 1989). Scholars of comparative welfare research, like Esping-Andersen, all focus on the role of welfare state policies in shaping maternal employment, gender equality and fertility (Rindfuss and Brewster 1996; McDonald 2000; Neyer 2003; Esping-Andersen 1999; 2009). By encouraging women and mothers to participate in the labor market, or by hindering them from working, social policies affect gender roles. In doing so, they indirectly influence childbearing decisions and, consequently, a country's fertility levels. A key assumption is that only societies that enable mothers to participate fully in the labor force will have a chance at maintaining sustainable fertility rates (Esping-Andersen 1999: 70).

In our study, we base our argumentation on comparative welfare state research. We argue that the welfare state shapes the conditions under which couples participate in the labor market and build families. In countries that encourage women to work, the female income is a crucial part of the total household income. In these countries, women are likely to postpone childbearing until they have achieved a sufficiently high income to support a family. In countries where social policies do little to facilitate maternal employment, there are fewer incentives for women to postpone childbearing until they have secured an income that is high enough to support having a family. Career-oriented women who belong to the group of high-income earners might avoid parenthood altogether.

We test this hypothesis by studying how the relationship between female earnings and fertility behavior differs between Denmark and Germany. Due to the region's special demographic situation after German unification, we exclude the eastern

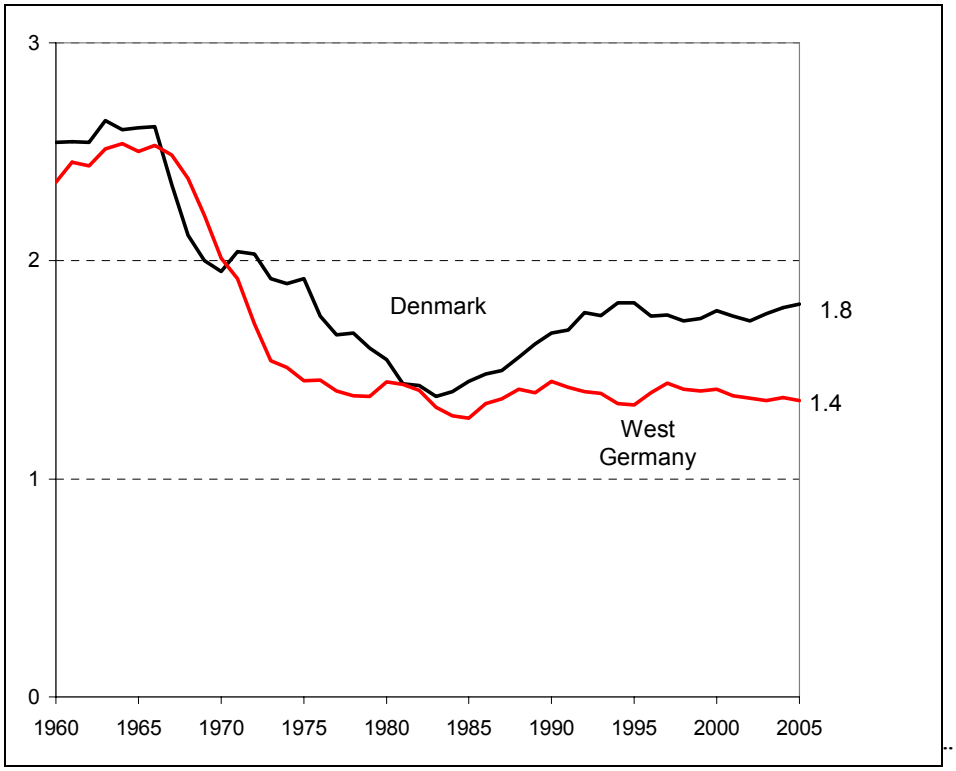
states of Germany from our study. Let us first provide a basic demographic description of the two countries.

West Germany and Denmark had both experienced steep fertility declines during the 1960s and 1970s (see Figure 1). In the early 1980s, the period Total Fertility Rate (TFR) in both countries reached 1.4 children per woman, which at that time were the lowest TFRs among all the sizeable countries in the world. However, since 1983 Danish fertility rates have increased continuously. Today, Denmark together with France and the other Nordic countries, has one of the highest period fertility rates in Europe. Meanwhile, West Germany's TFR developments have taken an entirely different turn. For close to four full decades, its TFR has remained amazingly stable at a level of only 1.3 to 1.4 children per woman.

Even though period fertility measures are distorted by tempo changes in childbearing behavior, the difference in period TFRs between Denmark and West Germany provide a good illustration of how divergent fertility patterns in the two neighboring European countries have become. Cohort fertility data confirm the observation that fertility levels in the two countries are at opposite poles of the "European scale." While, for example, a Western German woman born in 1965 had 1.5 children on average, a Danish woman born in 1961 had 1.8 children (Statistisches Bundesamt 2009; Andersson et al. 2009). Similar differences are discernable in terms of permanent childlessness. In West Germany, about 22 percent of women aged 40-44 in 2006 were childless (Statistisches Bundesamt 2009). In Denmark, the ultimate level of childlessness for women born in 1955-59 was about 14 percent (Andersson et al. 2009).

Beyond these crude demographic differences, there are substantial differences in the social policy context of the two countries. Even though parental leave regulations have been less comprehensive than in Sweden, Denmark's family policies are usually praised for their family friendliness (Abrahamson and Wehner 2008; OECD 2002). Like other Nordic countries, Denmark has radically reformed its social policies, and has, for example, gradually expanded public day care and improved parental leave conditions. These policies have enabled women to return to the labor market soon after childbirth (Rostgaard et al. 1999; Pylkkänen and Smith 2003). In West Germany, on the other hand, family policies have been slow to catch up with the demands of working mothers. In particular, little effort has been made to support maternal full-time employment. Child care for children under age three has been scarce, while for older children only part-time care has been made available (Hank and Kreyenfeld 2003). Parental leave regulations have been criticized for providing long periods of leave: after 1992, parents became entitled to job-protected leave of a maximum duration of three years per child. Additionally, the tax system, public pension regulations and the health care system all provide benefits to married couples who pursue a traditional division of labor. This began to change in 2007, when the government launched a major family policy reform which brought Germany's social policies more in line with those of the Nordic countries (Henninger et al. 2008). Yet during the time period under investigation in our study, Germany was a clear prototype of a conservative welfare regime that discourages maternal employment.

Figure 1: Total Fertility Rate, Denmark and Western Germany, 1960-2007



Source: Council of Europe 2005; Statistisches Bundesamt (data provided upon personal correspondence to the Statistisches Bundesamt)
Note: West Berlin is excluded from the time series after 2000

2.3 Prior empirical findings

Existing evidence on relationships between labor force participation, income and fertility in different countries is far from conclusive. Several macro-level studies have regressed TFR-values on GDP and/or aggregate measures of male and female wages (Butz and Ward 1979; Gauthier and Hatzius 1997). These studies provide no or contradictory evidence of an impact of wages or earnings on fertility. A recent study by Myrskylä et al. (2009) suggests a positive relationship between a country's Human Development Index and total fertility. Furthermore, macro-level data on total

fertility and female labor force participation in countries in Europe reveals a change from a negative to a positive association between these two national indicators from the 1960s to the 1990s (Andersen 1999: 68; Ahn and Mira 2002; Billari and Kohler 2004).

At the micro level, there are several studies, particularly for Scandinavian countries, that have addressed the income and fertility relationship. Heckman and Walker (1990) used the Swedish Fertility Survey to show that rising female incomes during the 1960s and 1970s were negatively associated with first, second and third birth risks. Tasiran (1995) incorporated better individual-level data on female earnings to the same data set and instead found a positive impact of female income on first birth risks. Andersson (2000) used data on Swedish women's annual earnings during the 1980s and 1990s and found a strong positive association between earnings and first-birth risks, but only weak associations with second- and third-birth behavior. Vikat (2004) reports very similar results for Finland. Using data for Norway and Finland, Rønsen (2004) found, however, a negative impact of female wages on fertility. Rondinelli, Aasve and Billari (2006) used Italian data and reported some negative effects of female wages on first birth rates, but hardly any effects on higher order births.

It seems that the evidence on the relationship between female earnings and fertility is mixed. However, differences in the empirical findings partially relate to different operational definitions of female income. Empirical studies which are more geared towards the economic model usually use predicted wages rather than observed earnings. Sociologists who are more interested in the interplay of different life-

course domains have used actual earnings in their models. Such studies may provide a more coherent picture of life-course dynamics. For the Nordic countries, they mostly show that female earnings and first birth risks are positively associated (Tasiran 1995; Andersson 2000; Vikat 2004).

With our study, we seek to contribute to existing sociological literature on the linkage between different life-domains. Our goal is to examine the impact of women's employment status and earnings on their fertility. Our investigation goes beyond previous research in several respects. First, we provide a cross-country comparison. This comparison is motivated by the hypothesis that the income-fertility nexus varies by welfare state setting. Second, our study draws upon highly reliable register data which span more than two decades. While a considerable amount of register-based research has been conducted for Nordic countries, the opportunities for conducting register-based research for Germany have been very limited in the past. Therefore, this paper is the first study to draw upon register data that compares fertility behavior in Germany with that of a Nordic country.

3 Data and Method

3.1 Method

In terms of methods, we apply event history modeling. In the first birth model, process time is represented by a woman's age. For second and third births, it is the duration since last birth. Time is measured in months. The major independent variable of interest in our modeling is the woman's income, measured as earnings

quintiles, and other information on the woman's labor market status; the calendar year is a control variable. For higher order births, we also control for the woman's age as a time-varying covariate (below is a more detailed account of how these variables are defined).

The objective of this study is not to provide a fully specified model that accounts for all confounding factors that might bias the female income and fertility relationship. Instead, we have a more modest ambition: we want to provide highly reliable first, second and third birth risks by female earnings, standardized for bare demographic variables. Obviously, such an approach can produce different results than a model that tries to single out the net effect of female income on fertility by including a whole battery of control variables, or by applying some more complex causal modeling. Still, this method could be better suited to disentangling the factual relationship between female earnings and childbearing behavior. Our approach provides us with straightforward "descriptive results" which are not distorted by possible collinearities with additional control variables. Certainly, our interpretation of results might sometimes be wrong because of the omission of some crucial controls. We are nonetheless confident that an accurate description based on high quality data on the associations between two crucial socio-demographic processes represents a valuable contribution to demographic research.

3.2 Data

For Germany, we use data from the German Statutory Pension Insurance (*Deutsche Rentenversicherung Bund*).[1] Data for Denmark come from the country's population register system, in which population data have been merged with data from various other administrative registers. We focus our analysis on women aged 20-44. The calendar period we cover is 1981-2001. In both data sets foreign nationals and foreign-born women have been excluded.[2] For Germany, we also exclude all eastern German women.[3] While we have tried to make the data sets as comparable as possible, each of the data sets has certain peculiarities that should be noted.

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[1] The data extract that is used here is the *Versichertenkontenstichprobe* 2007 (Sample of the insured population records drawn in 2007). This sample is a one percent sample of the original pension records, and it includes women from the cohorts born in 1940-1992. Data have been made available to us by the Research Data Center of the German Statutory Pension Insurance (Stegmann, Michael 2007; Rehfeld and Mika 2006).

[2] In Germany, non-natives are normally classified by their citizenship, while in Denmark and other Nordic countries, they are more often defined by their country of birth. The reason that we exclude non-natives is that we do not want to consider the various confounding associations of international migration with childbearing behavior.

[3] An Eastern German woman is defined here in a very narrow sense as a woman who has ever been employed in the territories of what used to be the Democratic Republic of Germany. This is a rather narrow definition, because it also classifies all East to West migrants as East Germans. However, we had to follow this definition, because earnings information in the registers for the East German population has been subject to special regulations which require additional considerations.

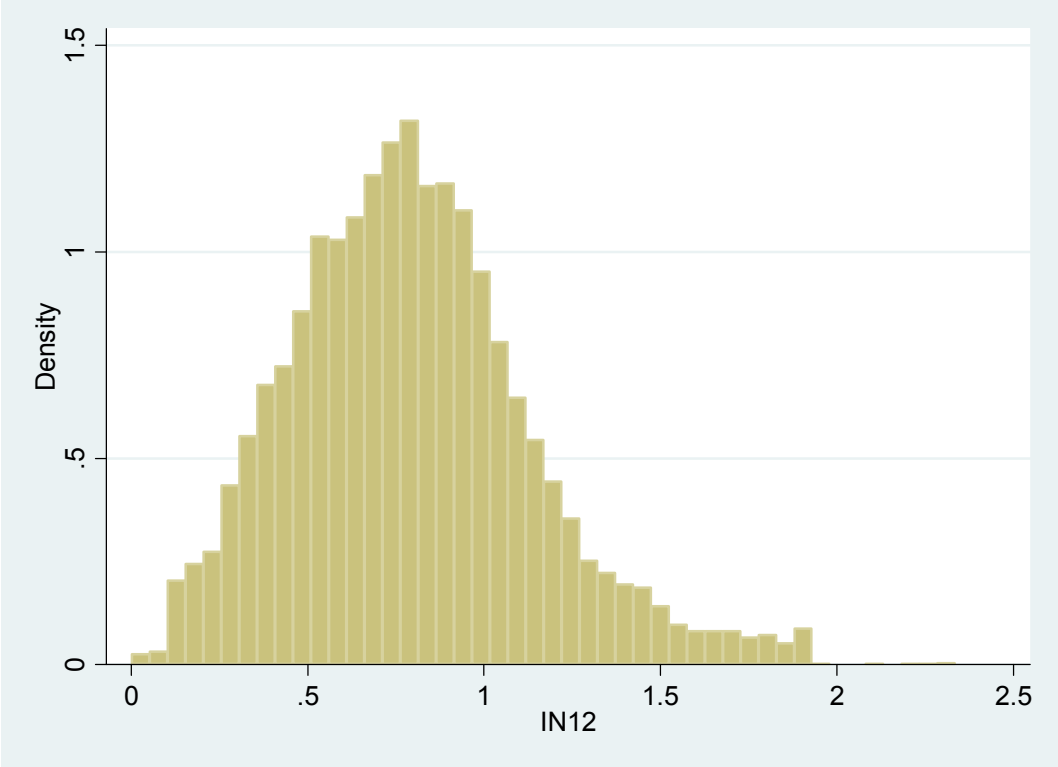
Characteristics of the German and Danish data sets

A significant advantage of the German data set is that it contains accurate monthly information on the employment and income situations of all individuals since age 15. For female respondents, the data also include information on the dates of each childbirth (for details on how these data have been compiled for fertility analysis, see Kreyenfeld and Mika 2008). This is worth pointing out because German law forbids the merging of data from different sources, and there is no other register data set for Germany that contains both complete fertility and employment histories. Fertility data are contained in the pension register because childrearing is taken into account in calculating an individual's pension rights. However, there are disadvantages to this data set that should be mentioned. First, the data only include persons who are covered in the statuary pension insurance of Germany. This applies to more than 90 percent of the German population, but certain professions (such as farmers, self-employed people or civil servants) are not included in the data set. Another disadvantage is that employment and income histories from the German pension registers only include episodes that are relevant for calculating pensions. These are periods of employment, unemployment, parental leave, some education and vocational training. Most periods spent in education, as well as periods when people had been inactive (for example, because they were housewives) are not included. Because we cannot always differentiate between educational participation and other types of non-employment, our analyses have limitations.

In the German data, income information is recorded in terms of "earning points." Contributions that stem from an average-level income lead in general to a one-credit

point in the pension record. The backbone of the calculation in the German pension insurance is the individual contribution made to the pension record. The monthly contributions are measured at the end of each year against the average annual national earnings.[4] Figure 2 plots the annual earning points of employed women for 1995. The graph illustrates that only a minority of women reach the average national income.

Figure 2: Distribution of (Annual) Earning Points, Western German Women, Ages 20-44 in 1995



[4] There is an upper limit to the income considered for the statutory pension insurance, the so-called "contribution assessment ceiling." For female earnings, this ceiling is, however, of minor importance since relatively few women achieve such a high level of earnings.

The Danish data cover the entire resident population in any given calendar year. A crucial difference between the Danish and German data sets is that the income information for Denmark is only available on an annual basis, when it is collected in the Danish taxation registers. For a given year, we have information on the amount of taxable earnings each Danish woman has received. Another difference between the two data sets is that earnings in Denmark, unlike in Germany, can also include transfer payments, such as unemployment benefits, parental leave payments and other taxable allowances. In addition to the earnings status in a given calendar year, we have separate information on educational enrollment from the educational registers and on unemployment experience from Danish unemployment insurance registers.

Variables

The dependent variable in our models is the first, second or third birth event. Because the German data include monthly earnings information, we have backdated the date of each childbirth by nine months to guarantee that income is measured before any pregnancy. In the Danish data, we have information on annual earnings and use the earnings information of one calendar year to predict the birth risks during the subsequent year.

The major independent variable in our models is female earnings, which we have grouped into income quintiles. As a reference to define the quintiles, we used the income distribution of women (with any earnings) aged 20-44 in 1995.[5] An alternative approach could have been to use the combined earnings distribution of women and men with earnings. However, we think our approach has greater merit, as the gender gap in earnings is quite large in both of the countries studied.

For Germany, we generated a combination factor of the activity status and the income variable. Women who are not employed are differentiated by whether they are in education (which contributes to pension rights), unemployed or involved in other unspecified activities. For the employed population, we distinguish the earnings quintile the woman belongs to. Figure 3 displays the descriptive statistics of this variable by birth order. We can see in Figure 3a that a about 25 percent of childless women are students or engaged in other activities. "Other activities" can be educational periods that do not count in the pension system. However, periods when women withdraw from the labor market to become housewives are subsumed under this label, too. Since Figure 3a only covers childless women, we may assume that the large majority of women classified as "others" are students, as the "housewife status" is rather uncommon for childless women. This is different when we turn to women with one or two children. A very large fraction of mothers are also engaged in "other activities." Since educational participation after first childbirth is rare in

[5] Earnings information in the Danish data has been deflated. For Germany, no deflation was necessary because we used earning points, which are not subject to inflation, instead of female income.

Western Germany, we can conclude from this graph that a large proportion of Western German women are inactive in the labor force after becoming mothers. During the 1990s, this percentage was only marginally lower than during the 1980s.

For Denmark, we did not construct a combination variable of activity status and earnings. Instead, we grouped the entire female study population according to their earnings into the five quintiles we defined and used control dummies for whether a woman had been a student or unemployed during the same year. In practically all cases of unemployment and/or study activity during a year, women had some taxable earnings as well. Thus all Danish women contributed to the quintiles we have defined.

Figure 3a: Income Distribution, Western Germany, Childless Women

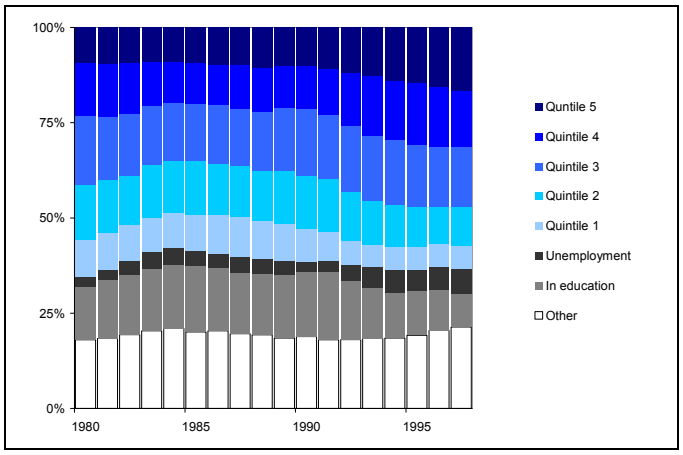


Figure 3b: Income Distribution, Western Germany, One-Child Mothers

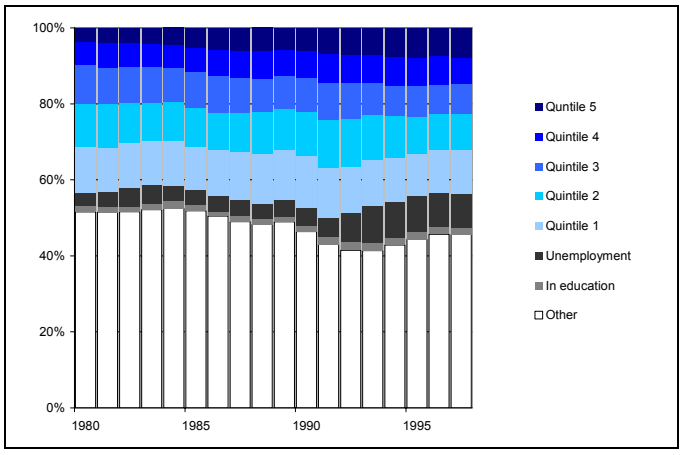


Figure 3c: Income Distribution, Western Germany, Two-Child Mothers

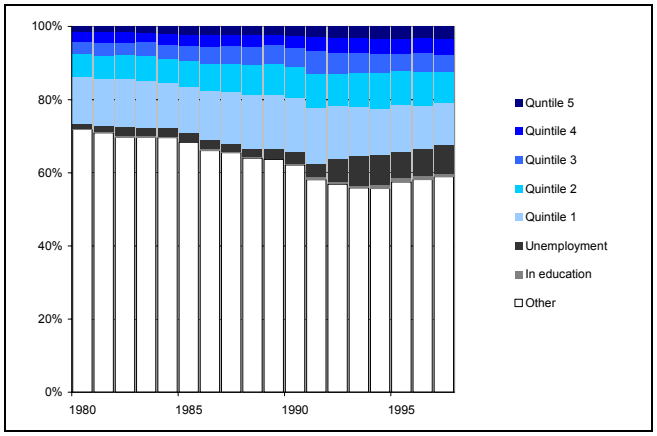


Table 1 provides an overview of the occurrences and exposure table for the main covariates. As can be seen from this table, there are many fewer events available in the German data set than in the Danish one. This is because we have (so far) only been able to access the scientific-use file of the German register data, which provides only a limited number of cases. This is particularly unfortunate for our study of third births, in which our data extract covers fewer than 1,000 events of this kind. In future work, we will extend our analyses to the much larger available German register data set.

Table 1: Occurrence and Exposure Table: Woman Months under Risk and Childbirths

	first birth		**second birth**		**third birth**	
	exp	**occ**	**exp**	**occ**	**exp**	**occ**
Germany						
In Education	17%	285	2%	58	1%	8
Other	17%	514	43%	1,742	60%	697
Unemployment	4%	161	5%	150	3%	37
Quintile 1	8%	340	13%	368	15%	117
Quintile 2	11%	533	11%	203	8%	55
Quintile 3	14%	609	8%	143	4%	33
Quintile 4	14%	625	8%	128	4%	21
Quintile 5	14%	536	8%	115	3%	10
Missing	3%	119	3%	49	2%	7
Total	100%	3,722	100%	2,956	100%	985
Denmark						
Quintile 1	39%	87,320	18%	57,034	17%	25,629
Quintile 2	16%	70,749	19%	77,414	20%	27,586
Quintile 3	16%	108,636	24%	99,653	24%	31,068
Quintile 4	16%	117,210	22%	90,783	21%	23,799
Quintile 5	14%	84,508	17%	63,902	18%	18,063
Total	100%	468,423	100%	388,786	100%	126,145

Note: exp =exposure time under risk, in percent of all person-months; occ =occurrences of births

4 Results

4.1 Results for Germany

Table 2 gives the relative risks of first birth for German women. Model 1 covers all women who can have a first birth, Model 2a and 2b provide separate results by calendar-year periods, divided so that years before and after 1990 are treated separately, and Model 3a and 3b give separate results for women below and above age 30. We first turn to Model 1. Our control variables provide the expected results: There is a bell-shaped impact of age on first birth risks. Furthermore, first birth risks decline over calendar time. The model also demonstrates a strong negative impact of educational participation on first birth risks. Women who are in education have a 66 percent lower first birth rate than employed women with a low income. "Other activities" reduce first birth rates as well, which tends to support the assumption that for childless women these periods are mainly educational episodes. Unemployed and low-income earners do not seem to differ in their first birth behavior. Furthermore, female income has a pronounced negative impact on first birth risks.

Model 2 addresses the question of whether the impact of female earnings on first birth risks has changed over calendar time. The idea behind this assumption is that, in Germany as well as in Denmark, the incompatibility of work and family life may have eased over time, which would suggest that the correlation between female earnings and fertility could have changed direction from the 1980s to the 1990s. However, there is only mild support for this idea. The gradient in the female employment and first birth nexus is weakly negative for the 1980s, while the gradient is more irregular for the later period. Nor is there much evidence of an

interaction between age, female income and first birth risks. As can be seen in Model 3, female earnings have a rather weak negative association with first birth risks at younger ages, and no impact at higher ages.

Table 2: Relative Risks of First Birth in Western Germany, Results from Piecewise Constant Event History Model

	Model 1 All		Model 2a 1981-1989		Model 2b 1990-2001		Model 3a 20-29		Model 3b 30-44	
Age										
20-22	1		1		1		1			
23-25	1.45	***	1.54	***	1.43	***	1.48	***		
26-29	1.67	***	1.51	***	1.87	***	1.74	***		
30-33	1.33	***	1.00		1.61	***			1	
34-37	0.56	***	0.34	***	0.77	***			0.43	***
38-44	0.09	***	0.07	***	0.11	***			0.07	***
Income & activity										
In education	0.34	***	0.34	***	0.36	***	0.34	***	0.90	
Other	0.71	***	0.76	***	0.68	***	0.74	***	0.62	**
Unemployment	0.89		0.91		0.89		0.97		0.59	*
Quintile 1	1		1		1		1		1	
Quintile 2	0.99		0.88		1.10		1.00		0.95	
Quintile 3	0.88	*	0.82	*	0.93		0.90		0.73	
Quintile 4	0.89	*	0.87		0.92		0.89		0.88	
Quintile 5	0.93		0.82	*	1.01		0.82	**	1.04	
Period										
1981-1984	1		1				1		1	
1985-1989	0.91	*	0.92				0.93		0.79	*
1990-1995	0.84	***			1		0.80	***	1.08	
1996-2001	0.78	***			0.89		0.68	***	1.21	*

Notes: *** p<0.01; ** p<0.05; * p<0.10

Table 3 displays the results for the transition to second and third births. For second births, we find a strong negative gradient in how female earnings are related to second birth rates. Note too, that women classified as “others” have highly elevated second birth risks. In most cases, they are likely to be women who are non- active in the labor force. The third birth model did not provide any statistically meaningful results, which we attribute to the small number of events in our data for Germany.

Table 3: Relative Risks of Second and Third Birth in Western Germany, Results from Piecewise Constant Event History Model

	Second birth		Third birth	
Age of last previous child				
0-1 years	1		1	
2-3 years	1.12	***	0.95	
4 years	0.75	***	1.07	
5-6 years	0.51	***	0.91	
7 years and older	0.22	***	0.56	***
Age of woman				
20-22	1		1	
23-25	1.19	***	0.62	***
26-29	1.32	***	0.59	***
30-33	0.98		0.38	***
34-37	0.57	***	0.20	***
38-44	0.13	***	0.04	***
Income & activity				
In education	0.64	***	1.39	
Other	1.15	***	1.14	
Unemployment	0.90		1.05	
Quintile 1	1		1	
Quintile 2	0.81	***	1.16	
Quintile 3	0.71	***	1.26	
Quintile 4	0.69	***	1.10	
Quintile 5	0.67	***	0.65	
Period				
1981-1984	1		1	
1985-1989	1.13	**	1.38	***
1990-1995	1.07		1.14	
1996-2001	1.10	*	1.35	***

Notes: *** p<0.01; ** p<0.05; * p<0.10

4.2 Results for Denmark

Table 4 presents the results for first births in Denmark. As expected, educational participation lowers first birth risks (Model 1). However, this only applies to educational participation at younger ages (Model 3a). Unemployment is related to elevated first birth hazards at these ages (Model 3a), but has no effect on transitions to first-time motherhood at the higher ages (Model 3b). This is in line with our findings for Germany, where we also found that the impact of study enrollment and female unemployment on first birth rates differs by the age of woman (see Table 2). However, when we look at the impact of female earnings on first birth rates, we can see that the results for Denmark are very different from the results for Germany. Table 4 reveals a clearly positive association between a woman's annual earnings and her propensity to become a first-time mother. This result lends support to the idea that Danish women tend to postpone first-time motherhood until they have attained a sufficient level of earnings. A comparison of patterns during the 1980s and 1990s reveals that patterns are very similar in the two decades (Model 2).

For second births, female earnings and birth rates are slightly positively associated with each other (see Table 5). However, when we turn to third births, we find that the association becomes somewhat negative. Two-child mothers in Denmark who belong to the fourth earnings quintile have, for example, third-birth risks that are 20 percent lower than those of two-child mothers in the first quintile.

Table 4: Relative Risks of First Birth in Denmark, Results from Piecewise Constant Event History Model

	Model 1 All	Model 2a 1981-1990	Model 2b 1991-2000	Model 3a 20-28	Model 3b 29-43
Age					
20-22	1	1	1	1	
23-25	1.60	1.55	1.75	1.61	
26-28	2.25	2.00	2.76	2.34	
29-31	2.13	1.68	2.83		1
32-34	1.44	1.05	2.00		0.68
35-37	0.80	0.55	1.14		0.38
38-40	0.37	0.25	0.51		0.17
41-43	0.11	0.07	0.14		0.05
Study activity	0.72	0.72	0.73	0.66	1.03
Unemployment	1.32	1.38	1.25	1.41	1.01
Earnings status					
Quintile 1	1	1	1	1	1
Quintile 2	1.62	1.72	1.48	1.62	1.39
Quintile 3	2.09	2.10	2.00	2.05	1.88
Quintile 4	2.19	2.17	2.14	2.07	2.18
Quintile 5	2.21	2.10	2.17	1.80	2.31
Period					
1981-1985	1	1		1	1
1986-1990	0.95	0.96		0.92	1.13
1991-1995	0.99		1	0.89	1.40
1996-2001	0.96		0.95	0.80	1.50

Note: No significance levels are reported. As the analyses are based on the entire Danish population, practically any difference in relative risks is significant at a very low probability level.

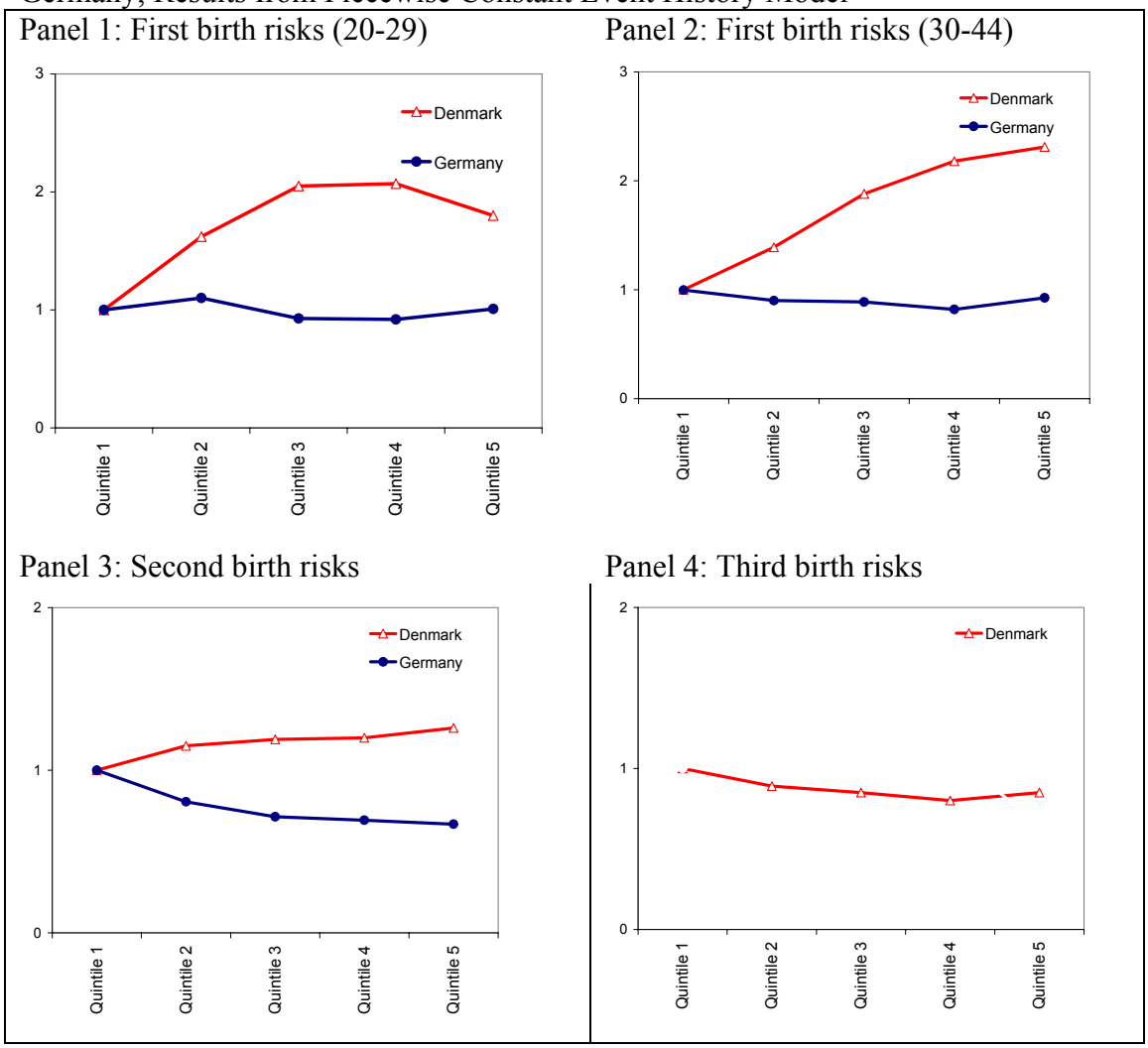
Finally, Figure 4 provides a graphical illustration of the German and Danish main results. The graph shows that the association between female income and first-time motherhood differs radically between the two countries. While Danish women seem to postpone first birth until they have secured a sufficiently high level of earnings, the association between female income and first birth risks is negative in West Germany. However, we do not find strong support for the claim that in Denmark a high female income is a prerequisite for having a second or third child.

Table 5: Relative Risks of Second and Third Births in Denmark, Results from Piecewise Constant Event History Model

	Second birth	Third birth
Age of last previous child		
0 years	0.03	0.05
1 year	1	1
2 years	2.33	1.54
3-4 years	2.35	1.69
5-6 years	1.32	1.46
7-9 years	0.71	1.01
Age		
20-22	1	1
23-25	0.97	0.77
26-29	1.05	0.57
30-33	0.98	0.45
34-37	0.66	0.29
38-44	0.27	0.11
Study activity	0.82	0.90
Unemployment	0.97	1.07
Earnings status		
Quintile 1	1	1
Quintile 2	1.15	0.89
Quintile 3	1.19	0.85
Quintile 4	1.20	0.80
Quintile 5	1.26	0.85
Period		
1981-1985	1	1
1986-1990	1.18	1.38
1991-1995	1.38	1.80
1996-2001	1.44	1.80

Note: No significance levels are reported. As the analyses are based on the entire Danish population, practically any difference in relative risks is significant at a very low probability level.

Figure 4: Relative Risks of First, Second and Third Births in Denmark and West Germany, Results from Piecewise Constant Event History Model



Notes: For full models, see Tables 2, 3 and 4. Since the results for the third birth model for Germany were statistically non-significant, we did not plot the rates in Panel 4 for Germany

5 Conclusion

In this paper, we have used German and Danish register data to investigate the relationship between labor market attachment, female earnings and fertility. We based our empirical research on the hypothesis that the welfare state shapes the earnings and fertility nexus. In countries like Denmark that support maternal employment, women will be more inclined to have children after they have become established in the labor market. In most cases, having their own earnings that are sufficient to support a family would be a prerequisite for becoming a mother. In countries like (West) Germany, where women usually have to reduce their employment activities after childbirth, a sufficient female income is not a prerequisite for having children. Instead, we may assume that high-income women would tend to avoid parenthood, which would result in a negative relationship between female income and fertility.

Our empirical estimation provides strong support for our hypothesis. While we find a negative association between female income and first-birth risks in Germany, we find the opposite pattern for Denmark. In this Nordic country, first-birth risks increase rapidly when women have reached the third income quintile. This provides strong support for the idea that a sufficient female earning situation is a precondition for forming a family in Denmark. However, for higher order birth no systematic pattern is discernable. In Denmark, women who belong to the lowest income quintile display reduced second birth rates. Apart from this, there does not seem to be a strong impact of female earnings on second birth risks. For third births, the association between female earnings and fertility actually becomes slightly negative,

even in Denmark. Evidently, two-child mothers who reduce their levels of labor market activity are more inclined than others to aim at a relatively large family size.

In short, our cross-country comparison provides compelling support for the notion that differences between countries in welfare state setup can translate into differences in fertility levels. In particular, our study demonstrates that contextual factors appear to be important in shaping how women's earnings and labor market behavior are related to childbearing and family dynamics.

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