

# Employment Characteristics and First Birth in Great Britain and Western Germany

Dissertation

zur

Erlangung des akademischen Grades

doctor rerum politicarum (Dr. rer. pol.)

der Wirtschafts- und Sozialwissenschaftlichen Fakultät

der Universität Rostock

vorgelegt von

Cordula Zabel, geb. am 20.6.76 in München

aus Rostock

Rostock, 7.6.06



Gutachter:

Prof. Jan Hoem

Max-Planck-Institut für demografische Forschung

Universität Rostock

Prof. Michaela Kreyenfeld

Max-Planck-Institut für demografische Forschung

Universität Rostock

Verteidigung am 18.10.2006 an der Universität Rostock

## Acknowledgements

This thesis was written during my time at the Max Planck Institute for Demographic Research. I would particularly like to thank Michaela Kreyenfeld for excellent mentoring. I have benefited immensely from her ongoing advice in the field of data preparation and analysis, as well as concerning theoretical questions. I have greatly profited from Jan Hoem's teaching, which enabled a thorough understanding of sophisticated techniques of analysis, and without which the analyses presented in this thesis would not have been possible. I very much enjoyed the friendly atmosphere at the Institute, and I am particularly grateful to everyone in the Laboratory of Contemporary European Fertility and Family Dynamics for so many helpful comments and advice. Most of all, I would like to thank my family for supporting me during all the years of studying. I am especially grateful to my mother for her careful proof-reading and her helpful comments, and to my sister Astrid for valuable comments on the introduction. Thanks especially to Michael for spending so much of his time in Rostock.

# Contents

<b>Chapter 1: Introduction</b>	<b>p. 10</b>
<b>Chapter 2: The Life Course as a Framework for Fertility Decision-Making</b>	<b>p. 12</b>
<b>2.1 Life course theory</b>	<b>p. 12</b>
2.1.1 Institutionalization of the life course	p. 13
2.1.2 Multiple dimensions of the life course	p. 15
2.1.3 Causality within the life-course	p. 16
2.1.4 Social change and cohort analysis	p. 17
<b>2.2 Decision-making in the life course: De Bruijn's model of subjective rationality</b>	<b>p. 18</b>
2.2.1 Models of rational decision-making	p. 19
2.2.2 Intra-individual elements of decision-making	p. 21
2.2.3 Intermediate fertility determinants	p. 24
<b>Chapter 3: Income, Work Conditions and First Birth</b>	<b>p. 26</b>
<b>3.1. Introduction</b>	<b>p. 26</b>
<b>3.2 Income and fertility</b>	<b>p. 27</b>
3.2.1 The classical framework for the relationship between family income and fertility decisions	p. 27
3.2.2 Men's income and decisions to have children	p. 30
3.2.3 Women's income and fertility decisions	p. 39
3.2.3.1 Estimates of opportunity costs of childbearing	p. 40
3.2.3.2 Research on the effect of education and employment on transitions to the first child	p. 42
3.2.3.3 Empirical research on the effect of women's income on fertility	p. 44
<b>3.3 Work characteristics</b>	<b>p. 49</b>
3.3.1 Family-friendly arrangements by work characteristics	p. 49
3.3.2 Negative consequences of family-friendly arrangements	p. 51
3.3.3 Effects of occupation on fertility	p. 55
3.3.4 Selectivity into family-friendly jobs	p. 58

<b>3.4 Education, work and fertility timing</b>	<b>p. 59</b>
3.4.1 Education and fertility timing	p. 59
3.4.2 Life-time earnings and optimal age at first birth	p. 61
3.4.3 Tenure, employment security and first birth	p. 67
3.4.4 Empirical research on the effect of timing of childbearing on wages	p. 68
3.4.5 Empirical research on the effect of labor market experience on the timing of childbearing	p. 70
<b>3.5 Conclusion</b>	<b>p. 71</b>

<b>Chapter 4: Family Policy and Family-Related Institutions in the United Kingdom and Western Germany</b>	<b>p. 77</b>
<b>4.1 Introduction</b>	<b>p. 77</b>
<b>4.2 Child benefit and tax deductions for children</b>	<b>p. 77</b>
<b>4.3 Tax benefits for married couples</b>	<b>p. 83</b>
<b>4.4 Support for low income families</b>	<b>p. 86</b>
4.4.1 Family Credit and Working Family Tax Credit in the United Kingdom	p. 86
4.4.2 Introduction of a family income supplement in Germany	p. 87
4.4.3 Support for families with no or little income	p. 88
<b>4.5 Childcare</b>	<b>p. 88</b>
4.5.1 Financial support for childcare costs	p. 88
4.5.2 The childcare infrastructure	p. 91
4.5.2.1 United Kingdom	p. 91
4.5.2.2 Western Germany	p. 93
<b>4.6 Maternity/ paternity leave and parental leave</b>	<b>p. 94</b>
4.6.1 United Kingdom	p. 94
4.6.2 West Germany	p. 95
<b>4.7 Attitudes towards maternal employment</b>	<b>p. 99</b>
<b>4.8 Conclusion</b>	<b>p. 100</b>

<b>Chapter 5: Differences in the Structure of the Labor Market between Western Germany and Great Britain</b>	<b>p. 102</b>
<b>5.1 Labor market regulations and labor relations in Great Britain and Germany</b>	<b>p. 102</b>

<b>5.2 Industrial restructuring in Great Britain and Germany</b>	<b>p. 104</b>
<b>5.3 Occupational composition of the labor force and gender segregation</b>	<b>p. 105</b>
<b>5.4 Employment characteristics</b>	<b>p. 110</b>
5.4.1 Temporary employment	p. 110
5.4.2 Self-employment	p. 110
5.4.3 Firm size	p. 112
5.4.4 Public vs. private sector employment	p. 113
5.4.5 Long hours	p. 113
<b>5.5 Unemployment</b>	<b>p. 114</b>
<b>5.6 Transitions from education to employment</b>	<b>p. 118</b>
5.6.1 Differences in the education and training systems	p. 118
5.6.2 Importance of education for labor market entry and job outcomes	p. 120
5.6.3 Job duration and occupational mobility	p. 123
5.6.4 Transitions from education to employment: summary	p. 125
<b>5.7 Women's labor force participation and part-time work</b>	<b>p. 126</b>
5.7.1 General development of labor force participation and part-time work	p. 126
5.7.2 Characteristics of part-time work	p. 128
5.7.3 Reentry patterns	p. 129
5.8 Inequality	p. 137
5.8.1 Developments in the income distribution and differences between Great Britain and western Germany	p. 137
5.8.2 Transfers	p. 142
5.8.3 Poverty	p. 143
5.8.4 Child poverty	p. 144
<b>5.9 Conclusions</b>	<b>p. 145</b>
<b>Chapter 6: Data and Method</b>	<b>p. 152</b>
<b>6.1 Introduction</b>	<b>p. 152</b>
<b>6.2 Data preparation</b>	<b>p. 153</b>
6.2.1 Combining retrospective and panel data	p. 153
6.2.2 Panel data on employment characteristics for the 1990s	p. 155
<b>6.3 Sample Selection</b>	<b>p. 156</b>

<b>6.4 Hazard models for risk of first birth</b>	<b>p. 157</b>
--	---------------

### **Chapter 7: Employment and First Birth in the 1990s:**

<b>Great Britain and western Germany compared</b>	<b>p. 161</b>
7.1 Introduction	p. 161
7.2 A general comparison of first birth timing and ultimate childlessness in Great Britain and western Germany	p. 162
7.3 Ultimate childlessness and first birth timing by education	p. 165
7.4 Risk of first birth by age in the 1990s	p. 170
7.5 Education and risk of first birth	p. 170
7.6 The partner's level of education and the business cycle	p. 174
7.7 Employment status and risk of first birth	p. 176
7.8 Firm size, sector and self-employment	p. 178
7.9 Interaction between the partner's self-employment and vocational qualification	p. 179
7.10 Total work hours per week and risk of first birth	p. 182
7.11 Occupation and risk of first birth	p. 186
7.12 Earnings and first birth risks	p. 191
7.13 Work hours, earnings, firm size, and risk of first birth	p. 194
7.14 Differences in the timing of first birth by education	p. 197
7.15 Summary	p. 202

### **Chapter 8: Employment duration, employer tenure and first birth in Great Britain**

<b>and first birth in Great Britain</b>	<b>p. 207</b>
8.1 Introduction	p. 207
8.2 Employment duration and first birth	p. 208
8.3 Tenure requirements for maternity leave and first birth	p. 221
8.4 Summary	p. 226

### **Chapter 9: Unobserved heterogeneity and the effect of non-employment on first birth risks**

### **Chapter 10: Conclusion**

**p. 232**

<b>Appendix</b>	<b>p. 239</b>
A.3 Appendix for chapter 3	p. 239
A.7 Appendix for chapter 7	p. 245
<b>references</b>	<b>p. 247</b>

# Chapter 1

## Introduction

In both Great Britain and western Germany, parenthood and employment are very difficult to combine. The two countries are similar with respect to the lack of a good childcare infrastructure. In situations where the compatibility of work and childcare is difficult, individuals' economic resources and special characteristics of their employment situation can be assumed to become particularly important for the decision to have a first child. In Great Britain and western Germany, women often interrupt or reduce their employment to take care of their children. Thus, the opportunity costs implied by their level of earnings and career resources should influence childbearing decisions. Men's financial resources are likely to be important for the ability to support their family, particularly when women interrupt employment for extended periods of time. For women who plan to return to work quickly, their level of income may be relevant for the affordability of private sector childcare. Whenever women's employment interruptions are short, the family-friendliness of their particular work situation can be expected to influence transitions to the first child if they are still expected to be the primary care-givers. Gaining employment security by gathering employment experience before having a first child can be important for women who plan to return to their previous job. Tenure is especially likely to affect childbearing decisions when it is a precondition for eligibility for maternity leave. Until very recently, this was the case in Great Britain for many elements of maternity leave. Empirical analyses are conducted to track the importance of direct costs of children, opportunity costs, family-friendliness of the employment situation, as well as employment experience. While the childcare infrastructure is not very developed in either country, the labor market, welfare state, and normative contexts diverge quite strongly between western Germany and Great Britain in other respects. Against these different backgrounds, the impact of employment characteristics on the decision to have a first child will conceivably take different shapes in the two countries.

The theoretical background needed to develop these research questions is expounded in the first chapters. An initial chapter uses life course theory as a guideline to identify considerations important for people's fertility decisions. Life course theory

provides a very good framework for understanding decisions that have long term consequences for people's own lives. The next chapter discusses economic fertility theories. Here, theories on the effects of men's and women's earnings and employment are discussed and contrasted with empirical studies. Life-course theory and economic fertility theories can serve as a starting point from which to develop hypotheses on the determinants of transitions to the first child in Great Britain and western Germany. However, to make these hypotheses more precise, information on the welfare state and labor market contexts in the two countries is needed. Thus, chapter 4 depicts the past and present situation of family-relevant welfare state policies and institutions in Great Britain and western Germany. This is followed by a comparison of the labor market structure in the two countries in chapter 5. The 6<sup>th</sup> chapter then describes the data sets and methods of analysis employed in the empirical investigations. The first empirical chapter, chapter 7, compares the impact of employment characteristics on transitions to the first child in Great Britain and western Germany in the 1990s. Chapter 8 analyzes the influence of employment experience and employer tenure on first birth timing in Great Britain. Chapter 9 looks into the question of self-selection into non-employment, to ascertain whether the assumed direction of causality from employment status to first birth transitions holds when the two processes are estimated simultaneously. Finally, a conclusion summarizes the main results.

## **Chapter 2**

### **The Life Course as a Framework for Fertility Decision-Making**

This chapter outlines very basic theoretical background assumptions upon which the subsequent more narrowly focused theoretical and empirical analyses are based. The first part of this chapter reviews life-course theory, and shows how economic and welfare state factors, discussed in later chapters, are relevant when looking at individual fertility decision-making from a life-course perspective. The second part of this chapter discusses assumptions implicitly made in the remaining chapters about the actual decision-making process and the decision-maker.

#### **2.1 Life course theory**

Life course theory seems to characterize decision-making situations for decisions that have long-term consequences for an individual's own life very well, and appears to point out aspects that the individual plausibly will consider (Huinink 1995b). Two aspects put into focus by life-course theory in this respect are the dependency of options at one time point on past decisions and the interrelatedness of different realms of the life course. For example, while having children is primarily part of the family sphere of the life course, it has consequences for future employment careers. The nature of these consequences, on the other hand, also depends on past employment decisions. Life-course theory also sets a framework for predicting the timing of important events. The long-term effects of having children, for example, are likely to depend on the timing of childbearing, and it is probable that individuals will consider this when they make decisions about having children. Two further aspects to which life course theory also draws attention are relevant for the timing of events in the life course as well. One is the normative or institutional age-structuring of the life-course. Another is the possibility that changes in social institutions or historical events have different effects on peoples' lives depending on the life-course phase in which a person is at the time the event takes place.

As mentioned by Huinink (1995b), life course theory is intended to be closely related to empirical research. It does indeed seem that there is a very close link to empirical research, given the vast body of empirical studies based on the general questions outlined above. There are many different empirical methods by which research questions based on life course theory can be tested. Event history models have often been used because they provide a possibility to study effects of variables whose values change over the life course, to examine the effect of events at one time point on later time points, and to study the effects of durations in states.

### **2.1.1 Institutionalization of the life course**

One element of life-course theory consists of conceiving the life-course as an institutionalized order of events. Certain normative expectations exist in society about the appropriate ages for important life-cycle events, such as receiving education, working in the labor market, entering a partnership, and having children. Additionally, there are certain expectations with respect to the appropriate order in which these events should take place. Institutions such as schools and universities structure the life course in a more direct way, by requiring specific numbers of years of attendance in order to attain certain degrees.

The study of age structuring of the life course has its origins partly in anthropological studies of age-sets in several East African societies, among others the Masai (Mayer 1998; Kohli 1985). In these societies, people belong to an age-set all their lives. People belonging to the same age-set collectively move through several age-status levels. Transitions from one level to the next take place at clear-cut points and are usually celebrated by ceremonies. However, members of an age-set are not necessarily all very similar in chronological age; at what time a new age-set is formed and who belongs to it is determined by other factors (Kohli 1985).

It became clear though, that the observed pattern cannot be used to describe contemporary European societies in an unmodified way. Not everyone makes the same kinds of transitions, that is, not everyone necessarily graduates from the same kinds of schools, not everyone starts work at exactly the same time, nor do people collectively enter retirement. People do not continue to make transitions together with the same group of people all their lives. Exact chronological age though, plays a much

more important role in determining when which kinds of transitions are possible. While large age differences exist between people belonging to the same age-set in the East African societies described in the anthropological literature, in contemporary European societies, people making the same kinds of transitions tend to be of more similar age (Kohli 1985).

According to Kohli (1985), life courses have become more predictable and life-course events have become more uniformly age-related across the process of industrialization and modernization in Western countries. To begin with, in pre-industrial times, risks of death were very high at young ages as well; people could hardly predict how old they would get to be, or which family members would survive together with them for which amount of time. Today, a much higher proportion of people actually marries (or enters a partnership) at some point in their lives; in pre-industrial times, for social and financial reasons, large proportions of people were excluded from marriage. The variance around the mean age at marriage has also strongly decreased. Age has become an important element in legal prescriptions of rights and responsibilities. The school system and the retirement system have continuously spread to all members of society and further contributed to the age-structuring of the life course. In the labor market as well, promotions and recruitments are highly dependent on age (Kohli 1985).

Welfare state institutions can also affect the timing of events in the life course. Parental leave regulations, for example, can influence possibilities of returning to work after having children. They also set guidelines for the length of absence from the labor market. Differences in parental leave regulations and other family-related welfare state regulations between Germany and Great Britain will be discussed in chapter 4.

Institutions like the school system, the retirement system, or parental leave regulations may not be the only factors contributing to an age-structuring of the life course. There is also evidence that normative expectations with respect to the appropriate age for and ordering of important life course events exist. Elder (1975) summarizes research on age norms and sequencing norms for life events. Studies have shown a high degree of awareness among respondents on age norms for life course transitions. There have been investigations about possibly detrimental outcomes of devia-

tions from the normative time schedule, but results are mixed.<sup>1</sup> A later study by Rindfuss et al. (1987) examines both the degree of prevalence and the consequences of disorder in the life course. Rindfuss et al. (1987) find that the sequencing of education, work, housekeeping, and also military service among 1972 high school graduates in the United States in their first years after graduation is very diverse. They study whether a more norm-conforming sequencing of education, followed by work, and possibly by housekeeping, leads to a higher probability of becoming a parent as compared to other sequencing. It seemed to turn out that it is less the accordance to or deviation from a normative sequence of events that matters for parenthood, but rather the amount of work experience and the tendency to adopt a homemaker role<sup>2</sup>.

Though adherence to norms about the sequencing of education and work trajectories may be relatively weak, it does seem that there is strong adherence to the norm of postponing family formation until the completion of education (Rindfuss et al. 1988; Hoem 1986; Blossfeld and Huinink 1991). This will be discussed in more detail in section 3.4.1 along with implications for the effect of educational attainment on birth timing.

### **2.1.2 Multiple dimensions of the life course**

A second focus of life-course research is the multidimensionality of the life course. Elder (1975) describes this research area as focusing on problems of synchronization and coordination of different role sequences, such as sequences of family roles, sequences of work and earnings stages, as well as phases of social participation and consumption. One problem of synchronization is that of couples who need to coordinate their separate career lines. Elder (1975) points out that an important research focus has been on phases during which transitions in multiple spheres of the life course

---

<sup>1</sup> The studies summarized by Elder (1975) are Roth (1970), Sofer (1970), Neugarten et al. (1965), Bacon (1974), Bartz and Nye (1970).

<sup>2</sup> Rindfuss et al. (1987) study whether disorder in the non-family sphere has an effect on the probability of becoming a parent. No homogenous effect of disorder was found, instead it depended on the type of disorder. Being a homemaker, and working afterwards, for example, led to higher probabilities of parenthood for women as compared to following a more normative sequence of events. People who were looking for work or doing some other non-work activity, and then began to work, on the other hand, had lower probabilities of becoming parents, presumably because they needed more time to establish a secure employment situation. People who continued their education and then began to work also had lower probabilities of becoming parents, although this counted as an orderly sequence. Many further variations in sequences were also compared.

take place in close sequence, typically the transitions that take place in the young adult years. Huinink (1995b) names educational trajectories, health trajectories, and also trajectories of cognitive development as further dimensions of the life course that interact with each other. Both Huinink (1995b) and Elder (1975) point out that there is a close relationship between multidimensional life course research and psychology. In this context, Huinink (1995b) draws attention to the interaction between events in other dimensions of the life course and cognitive development. Elder (1975) cites research on the impact of life course events involving strong change in the family, work, or residential sphere on adverse health changes. Other research has focused on the degree to which respondents retain control over goal outcomes after important life course transitions (Elder 1975).

Chapter 3 will focus on the relationship between work characteristics and decisions to have a first child. Following the guidelines set by life course theory, the assumption is that characteristics in one sphere of the life course, the employment sphere, can have effects on a different dimension of the life course, the family dimension. The synchronization of family and employment careers can be very challenging. The difficulty of coordinating these two different life course spheres may depend on work characteristics. Therefore, people working in jobs that are somehow more compatible with bringing up children may be more likely to decide to have a first child. This will be discussed in more detail in chapter 3, and respective hypotheses will be empirically tested in chapter 7.

The degree of compatibility of work and family careers is also likely to be determined in part by welfare state institutions. The amount of public child care, for instance, is an important factor in determining the compatibility of work in the labor market and of caring for children. Societal norms on the extent to which childcare should be used may also have an effect on the compatibility of working and parenthood. These types of norms have been shown to differ strongly between Germany and Great Britain.

### **2.1.3 Causality within the life-course**

Life-course theory also raises questions about long-term consequences of events in the life-course. To what degree do decisions or external events that took place at a certain

age or a certain stage of a process, such as of gaining experience in the labor market, of moving through educational institutions, or of partnership duration, have an impact on later developments? Mayer (1998) and Huinink (1995b) refer to the presumed causality between earlier decisions and experiences and later options as self-referentiality of the life course.

In chapter 3, the implications of fertility decisions for life-time earnings are discussed. There has been a lot of empirical evidence on the negative effect of motherhood on life-time earnings. In this sense, the decision to have a child appears to have strong long-term consequences. Becoming a mother seems to have strongly altered life-course options for many women. There is also some research on the effect of the timing of childbearing on life-time earnings. The question is whether people anticipate the effect of becoming a parent on their employment careers and whether this influences their fertility decisions. In chapters 7 and 8, hypotheses on the effects of occupation, earnings, and employment duration on first birth risks are tested to see whether there is any support for the idea that opportunity cost considerations influence fertility decisions.

#### **2.1.4 Social change and cohort analysis**

Cohort analysis points to the significance of life-course phase for the impact of social change or of historical events on individuals' lives. People who were the same age, or were in the same career or family phase at the time of a specific historical event, or at the time new legislation becomes effective, may share a common imprint on their life-time outcomes. Contemporary social discussions or new ideas about societal change have been observed to influence younger people in more intense phases of socialization more strongly than older people who are already more established in their family formation, careers, and personality development (Ryder 1965; Mayer and Huinink 1990).

To actually pinpoint the impact of new family legislation, it can often be more useful to make use of period indicators than to compare cohorts. Although only a limited number of cohorts are usually affected, their range is still usually too broad and the possible causes of differences too numerous to be able to make out the impact of one specific change in legislation. Comparing the period before and after the legisla-

tion became effective, for all cohorts together, can sometimes be more useful. This is done to investigate whether the introduction of maternity leave in Great Britain, that was conditional on employment tenure, had any effect on first birth timing.

## **2.2 Decision-making in the life course: De Bruijn's model of subjective rationality**

When we derive hypotheses on interrelations between different parts of the life-course, we are implicitly making assumptions about the nature of the individual's decision-making process. Often, the assumption is that people at least to some extent act rationally and choose among the options available in a given situation the one that best leads to fulfilling their goals. In a few cases though, the assumption is that people act more strongly according to societal norms.

It is easier to derive hypotheses on actions on the basis of rational choice assumptions than if one assumes that people act normatively. If one has information about the decision-making situation, about the available options, it is often not very difficult to deduce which option would be optimal. If, however, one assumes that a person is acting according to norms, one needs additional information about the nature of the normative prescriptions. Norms, though, are not individual-level characteristics, and therefore cannot be incorporated into models in the same manner as for example occupational characteristics or family status variables. One way norms could be taken account of would be to compare fertility patterns between countries or regions that have different average outcomes on value surveys for certain items such as approval of the use of childcare, or of maternal employment.

There are many discussions of models of decision making in the social sciences. De Bruijn (1999) however, has specifically discussed the relevance of models of decision making for demographic research. Therefore, it may be useful to take a closer look at his detailed discussion of factors involved in fertility decision-making. It will not be possible to actually empirically account for most of the factors explicated in de Bruijn's (1999) model. However, it can be helpful to become aware of some assumptions usually implicitly made when modeling fertility decisions in the life-course. As de Bruijn (1999) shows, assumptions about the decision-making proc-

ess involve further-going psychological assumptions about the decision-maker, as well as assumptions about the knowledge available to him or her.

### **2.2.1 Models of rational decision-making**

Models of rational decision-making, used in order to understand and predict individual-level decisions, are very widespread in the social sciences. They offer a way to incorporate a voluntaristic model of man (de Bruijn 1999), i.e. a model of a purposive, self-determined actor who is aware of his or her situation and has the freedom to act in a manner as to best meet his or her own ends. It seems that the aim of developing models of rational behavior in the social sciences is not to better understand what is meant by the concept of rationality. Rather, it seems that social scientists, including de Bruijn (1999) generally aim to develop a model by which to better describe empirical behavior. It is assumed that people to some extent behave rationally. If they do so, by using models of rational behavior, one can better understand and predict behavior.

Often, especially in micro-economics, a so-called instrumental model of rational decision-making is used. This assumes a universal preference structure, and assumes that the actor will choose, from among the options objectively given in his or her decision-making situation, the one that best fits the preference structure. Using this kind of a basic model of rational choice, it is possible to predict decisions solely on the basis of the options objectively open to the actor (de Bruijn 1999).

For de Bruijn (1999), however, such an instrumental model of rational decision-making is not sufficient for really understanding individual-level decisions relating to demographic behavior. According to de Bruijn (1999), it is necessary to go yet one level deeper and to examine intra-individual elements of decision-making. At the intra-individual level, one must gain an understanding of people's subjective representations of decision-making situations, of the origins of people's preferences, of people's beliefs about the efficacy of their own actions, as well as of their specific decision rules, which may differ from strict utility-maximization considerations (de Bruijn 1999). De Bruijn's (1999) consideration of intra-individual determinants of decision-making has its background in psychological research and research in the field of the cognitive sciences.

De Bruijn (1999) is in favor of using a subjective model of rationality in order to better understand fertility decision-making. What is meant by a subjective model of rationality is better understood by contrasting it to other, more classical models of rationality, such as functional and substantive rationality.

If one describes decisions as being rational, one could mean they are rational in the functional sense. Functional models of rationality denote behavior as rational when the means are appropriate for meeting the ends. The actor's internal processes of reflection and decision-making are unimportant from this perspective. A person does not even have to be consciously making a decision in order for a certain instance of behavior to be considered rational. For instance, a person could perform a certain instance of behavior while hypnotized, or could even achieve a result by accident. Still, this behavior would be considered rational in the functional perspective of rationality, as long as the results of the behavior meet a given goal as well as possible (de Bruijn 1999). Using the functional model of rationality to describe behavior may not be very helpful in understanding fertility decisions, since internal processes can lead to variations in the decision outcomes. However, internal processes are not taken into account in the functional model of rational behavior.

In micro-economics, when decision-makers are described as being rational, reference is usually being made to substantive or instrumental rationality. Here, internal reflection and reasoning as a cause of behavior is part of the definition of rational behavior. The rational actor is assumed to have a clear view on the available means and the constraints, and is able to evaluate possible options of behavior against a clear and stable preference ordering without mistakes of reasoning. Preferences are often considered to be easily deducible from more general, universal goals. In essence then, all actors in a given situation are assumed to have identical preferences. Consequently, behavior can be predicted from the external constraints given in a specific situation alone. Although it is explicitly assumed that the actor has an active part in undertaking internal considerations and deciding upon the best possible alternative, this process of decision-making in effect becomes unimportant for the model. It is always the same, thus it can be taken for granted. Apart from the assumption that the actor is taking an active, conscious part in decision-making, there is actually no difference between the substantive and the functional models of rationality (de Bruijn 1999).

According to de Bruijn (1999), the main problem with the substantive model of rationality is probably that it does not fit any actual instances of decision-making. People's preferences usually are not so easily deducible, people's subjective interpretations of their decision-making situations do not always fit the objective options and constraints, processes of goal-optimization are not always fail-proof. Lastly, but this criticism only applies if substantive rationality is taken as a global model of behavior, some behavior is not rational at all, but can rather be described as institutionally determined, or as merely habitual.

In micro-economics itself, many modifications have taken place in order to better fit the substantive model of rationality to reality. Utility has been replaced by subjectively expected utility to incorporate uncertainty and game theory addresses the problems posed by interaction. Theories of learning and information search have also been introduced (de Bruijn 1999).

The model of decision-making advocated by de Bruijn (1999) is a subjective model of rationality. In this model, the classification of behavior as rational crucially depends on the intentions of the actor. If the actor has the intention of acting rationally, even if he or she has an incorrect representation of the situation and makes mistakes in calculating the best possible course of action, the resulting behavior is nonetheless considered to be rational. According to de Bruijn (1999), such a model of rationality is best equipped to aid in understanding the actual causes of behavior. One needs to gain an understanding of the actual internal processes of decision-making in order to understand behavior and to provide a realistic model of behavior (de Bruijn 1999).

### **2.2.2 Intra-individual elements of decision-making**

De Bruijn (1999) specifies various intra-individual elements of decision-making. In contrast to the substantive or instrumental model of rationality described above, he allows these intra-individual factors in decision-making to vary and grants them a substantial role in determining the outcome of the decision-making process.

According to de Bruijn (1999), people store information about the world around them in so-called mental schemes. Mental schemes are structures of knowledge or maps of how different pieces of information are related to each other. Mental

schemes help people abstract from specific situations, and to identify situations as being similar to situations already experienced in the past or heard about from other people. People's subjective representations of reality based upon mental schemes may differ from objective representations of reality. Mental schemes however, and not objective reality, are the basis for personal considerations in decision-making situations in de Bruijn's (1999) model.

In de Bruijn's (1999) framework of fertility decision-making, objective options and limitations, set for example by social institutions, are seen to enter individual decision situations by first entering people's mental representations of their problem situation via learning processes. People's perceptions of the options and limitations set by social institutions may differ from an outside observer's assumptions of what enters into people's considerations. Thus, in this perspective, for a good model of parenthood decision-making, one would actually need variables for people's perceptions about the options available to them.

It would be good to have information on people's knowledge of family policy provisions, as well as on their beliefs about the impact of having children on their labor market outcomes. However, although they are more likely to immediately influence fertility decision-making, we have no direct information on people's perceptions of their options. We can only try to get an idea of their options by accounting for their present work conditions, as well as considering welfare state and other societal provisions for families. Doubtlessly, this provides an incomplete picture of even the objective situation. People's subjective perceptions of the situation are even more difficult to grasp.

Another important factor in de Bruijn's (1999) model of individual-level processes of fertility decision-making is subjectively perceived personal control. Subjectively perceived personal control is the degree to which people believe that they can actually achieve what they decide upon, the degree to which they believe in the efficacy of their decisions (de Bruijn 1999). In the German Socio-Economic Panel (SOEP), there actually are items asking people whether luck or agency is more important for what happens in their lives and whether they can generally achieve the goals they set for themselves. These items could be interpreted as indicators of self-efficacy. However, as described below, including variables on self-efficacy can be quite problematic.

A related problem is whether to account for variation in preferences. An implicit assumption is often that preferences are inter-individually constant. When looking at the effect of work conditions on fertility, for example, given a constant set of preferences, no matter what they are precisely, people will always be more likely to decide to have children the more compatible children are with their work. If everyone's preferences are the same, those who can better combine parenthood with their work will be more likely to have children (excepting the cases of zero or negative utility from either children or work). However, the situation gets more complicated if one allows preferences to vary inter-individually. Differences in preferences may stem from differences in socialization, personality differences, or differences in past experiences. There may be strong cultural influences on preferences for children. Preferences for children may depend on whether people with children are seen to have a high or a low status within a society, or for instance on whether social activities are organized around children or not (Rindfuss et al. 1988). Preferences may vary with the occupational group. Therefore, they may be important in explaining differences in fertility patterns between occupational groups. Occupational subcultures may be a reason for differences in preferences regarding parenthood between members of different occupational groups. There may also be a selection effect of those who have a strong preference for children into occupations that are more compatible with parenthood.

A problem with including preferences and self-efficacy variables is that preferences and perceptions of self-efficacy may to a large degree reflect objective opportunities and constraints. For instance, people may respond that having children is not important to them at all. However, people may already be taking the consequences of having children in their specific situation into account. In a different occupation, or with different opportunities for childcare, the same people might answer that having children is important to them. So, people may be indicating the result of a decision-making process when asked for preferences alone. Pure preferences, independent of options and constraints, may be difficult to become aware of. Similarly, perceptions of self-efficacy can easily depend on the amount of objective constraints to action in a given situation.

One option how to take account of preferences in fertility decision-making would be to control for unobserved heterogeneity. Models including unobserved heterogeneity are estimated in chapter 9. To account for selectivity into non-employment,

models controlling for correlation between unobserved heterogeneity in transitions to first birth and unobserved heterogeneity in choice of employment status are also included. The presumption is that especially women in older cohorts may have left the labor market early in marriage if they were especially family-oriented and held strong traditional values. Women with these values may have higher transition rates to first birth. The cause, however, then would not primarily be their employment status (being not employed), but the values that had led to exiting the labor market in the first place. The hypothesis is further that this is not so relevant for younger cohorts, because few women leave the labor market upon marrying before having children.

### **2.2.3 Intermediate fertility determinants**

De Bruijn (1999) also emphasizes the importance of so-called intermediate fertility determinants. Of course, fertility outcomes are not the direct result of fertility decision-making. Rather, in order to achieve the fertility outcomes they have decided upon, people make more immediate decisions on such intermediate determinants as marriage, contraceptive use, abortion, sexual intercourse, or breastfeeding durations. Decisions on these intermediate determinants do not always perfectly translate into the desired fertility outcomes. Thus, to study fertility decision-making, it may in some cases be more useful to study the more direct decisions relating to these intermediate fertility determinants. Sometimes, people will also make decisions relating to these intermediate determinants alone, without actually having fertility outcomes in mind as an object of decision-making. In some contexts not all of the intermediate determinants may be available or considered an acceptable option. Then, availability of intermediate determinants, such as contraceptives, would have to enter into the considerations of fertility decision-making. This would represent a further constraint on fertility decisions.

However, in most industrialized societies, there are comparatively few barriers to the availability of contraceptives. Fertility decisions may not always be perfectly realized. It would be good if we could assume that variations in the realization of fertility decisions are random and not correlated with any other important characteristics. It is not clear if this is the case, or if there are correlations between contraceptive use and age, education, or work status. In the data I will be using, there is no information

on family planning practices, so this cannot be included in any models. It might be important to remember, though, that this is a factor that is simply being taken for granted.

## Chapter 3

### Income, Work Conditions and First Birth

#### 3.1. Introduction

This chapter reviews economic theories of fertility in order to later utilize them to develop hypotheses on the effect of men's and women's employment characteristics on first birth transitions. First, classical economic fertility theories are reviewed. Empirical studies often refer to a theoretical framework suggesting a negative effect of income on transitions to motherhood due to opportunity costs, but a positive effect of men's income on their ability to support a family. This framework is frequently attributed to Gary Becker. However, as it turns out, the focus of Becker's theoretical discussion is not the opportunity costs of motherhood. A small group of authors do draw up a framework explicitly incorporating opportunity costs for women. Yet, the relevance of opportunity costs is discussed controversially. Most early theoretical contributions on economic factors involved in fertility decisions, though, including much of the work by Becker, do not deem women's characteristics to be very important at all. Their focus is rather on the direction of the effect of men's income on fertility. This is very extensively debated. Having a theoretically founded hypothesis on the direction of the effect of men's income on first birth transitions is important for this study as well, so this discussion is of interest to follow. The effect of men's income on fertility is the topic of section 3.2.2. Empirical research on the opportunity costs of motherhood, as well as on the effects of women's education and employment on fertility, will be reviewed in section 3.2.3. More recently, reference has often been made to the role of work characteristics such as flexible employment schedules for reducing opportunity costs of motherhood. This discussion will be reviewed in section 3.3, in order to later derive hypotheses on the impact of family-friendliness of the employment situation on fertility. Finally, in section 3.4, theories of fertility timing will be discussed. Economic theories of fertility timing seek to determine the time point for the birth of a child at which the level of life-time utility is maximal given a fixed degree of incompatibility between work and motherhood, while other approaches view the timing of fertility as an instrument that can be used to decrease the friction between employ-

ment and parenthood. Theories of fertility timing will be used to derive hypotheses on the effect of employment experience on first birth risks, studied in chapter 8.

It appears that theories of men's and women's income effects on fertility, citing quality-quantity trade-offs for men and opportunity costs for women, were first discussed in family economics literature in the 1960s and 1970s. As indicated above, modern economic theories of fertility first focused on completed family size and its relationship to men's lifetime earnings. One goal of modern economic theories of fertility was initially to explain decreases in fertility over time, despite general growth in well-being and levels of income. Family economists and demographers also tried to explain why the number of children was greater in low-income than in high-income families within one society and time-period. These questions are all quite different than the present question referring to the determinants of first birth risks. In the 1960s and early 1970s, childlessness was still quite low in Europe and the United States. It seems that determinants of first birth were not a very interesting research question. Leibenstein (1974) for example, explicitly states that he is not interested in explaining the determinants of transitions to the first or second child, he says it is enough to concentrate on higher order births, for instance on the question why a family would only have 4 rather than 5 children. None-the-less, these approaches are very useful for developing hypotheses on the determinants of first birth risks.

After summarizing some early theories on possibly ambiguous effects of men's income on fertility as well as on women's opportunity costs of childbearing, I will move on to discuss the relationship between work characteristics and fertility decisions.

## **3.2 Income and fertility**

### **3.2.1 The classical framework for the relationship between family income and fertility decisions**

As noted above, there appear to be only few theoretical discussions of the economics of fertility that correspond closely to the widely cited framework of opportunity costs for women and positive income effects for men. This framework though, especially since it is so often applied, seems to have a very high degree of plausibility. There-

fore, it might be interesting to try to identify some of its origins. As pointed out by Robinson (1997), an early framework in this vein to explain secular fertility decline despite rising family income, was proposed by Leibenstein (1957). This framework leads to a prediction of negative effects of women's income, while the direction of the effect of men's income is more ambiguous. Leibenstein (1957, p.161) categorizes sources of utility and disutility of children. He names three types of utility derived from children. The first is 'consumption utility', that is, the personal pleasure parents gain from having children, the second is the contribution children make to family income, and the third is the old age security provided by children. He distinguishes two types of costs arising from children, direct and indirect costs. Direct costs are all types of maintenance expenses, such as for food and clothes. Indirect costs are opportunities forgone by having a child, such as opportunities of mothers to work, or the family's decreased possibilities for mobility. A similar framework is also set up by Schultz (1969).

According to Leibenstein (1957), there are three main factors causing changes in the utilities and disutilities of children across the course of economic development. One is the increase in per capita income, a second is increased chances of survival, and a third is changes in the occupational distribution.

Leibenstein (1957) does not see any clear effect of increases in per capita income on the consumption utility derived from children. However, utility derived from children as sources of old age security are seen to decrease as per capita income increases. Children become less important providers of old age security as their parents' incomes and possibilities to insure themselves rise. The direct costs of children are seen to rise as per capita income rises, because the style in which children are maintained becomes more costly as their parents' income rises, which on average will be the case as per capita income rises. Opportunity costs are also likely to rise as per capita income rises, because of greater forgone earnings during the time spent caring for children.

Better chances of survival for children increase the utility per child, according to Leibenstein (1957), because of the longer life-span during which a child can provide utility. At first, this is seen to increase fertility, until the effect of costs of additional children, and the realization of these costs, overrides the initial positive effect of lower child mortality. However, while declines in child mortality are very large at first, they are assumed to be much less dramatic as economic development proceeds.

Changes in the occupational structure make longer years of schooling necessary, decreasing the amount of time a child can use to contribute to the family's income. Direct costs rise, because training becomes more expensive. Indirect costs of having children rise, because taking advantage of the opportunities provided by new types of occupations requires more time away from the family (Leibenstein 1957).

Thus, in the course of economic development, according to this theory, the direct and indirect costs seem to generally rise, while the utilities related to having children decrease.

To what extent do these considerations relating long-term economic development and rises in per capita income to changes in the fertility decision-making situation also apply to cross-sectional differences in income in one society and time-period, or to differences in income across the life-course? It does not seem likely that there will be differences in the extent to which children provide family income or old-age security between income groups in one society. In most modern industrial societies, like Great Britain or Germany, child labor is forbidden, and school attendance is compulsory up to relatively high ages. Also, almost everyone is a member of some pension scheme, and the chances that children from low-income families will be able to provide for their parents at old age are probably low. However, it could be the case that direct and indirect costs of children are higher for high-income than for low-income families. Differences in direct and indirect costs, as well as differences in values and general patterns of expenditures between income groups are the focus of discussion in much of the subsequent literature (Becker 1960; Espenshade 1972; Leibenstein 1974; Cain and Weininger 1973). High income families are likely to have higher standards for themselves and for their children with respect to housing, clothes, or recreational activities. Duration of education tends to be correlated with parents' economic status. This increases the cost of education, especially if education is partially privately paid for. But even if it is publicly financed, maintenance costs for children during education are usually paid for by their parents. Opportunity costs will also be higher for families, especially mothers, with higher income. Thus, it seems that while the utility gained from having children is unlikely to vary much with cross-sectional differences in income, there may indeed be large differences in costs of children between low-income and high-income families.

The indirect costs, or opportunity cost, apply largely to women, as long as child care is not well provided for and women are the ones primarily expected to be

responsible for raising children. By the same pattern, if men are expected to be the primary breadwinners, direct costs of children would be paid primarily from men's income. In this case, one should generally expect that women with higher income will be less likely to decide to have a child. The relationship between men's income and decisions to have children is less clear. Because of higher standards of living and greater expenditures per child, direct costs per child may be higher in the same society and the same point in time for fathers, or potential fathers, with higher levels of income. On the other hand, they can also better afford higher expenses for children than men with lower income. As pointed out by Leibenstein (1974), theories concentrating on costs of children are only capable of explaining a negative relationship between income and number of children if the rise in costs is greater than the rise in income.

The following section will discuss, first, the relationship between men's income and decisions to have children, focusing primarily on direct costs of children. The subsequent section will discuss the relationship between women's income and decisions to have children, focusing primarily on opportunity costs<sup>3</sup>.

### **3.2.2 Men's income and decisions to have children**

There has been much discussion with respect to the direction of the effect of men's level of income on fertility decisions. Intuitively, one might assume a positive effect. If men are expected to be the primary breadwinners, it should always be easier to afford costs related to having an additional child when the level of the potential father's

---

<sup>3</sup> The general structure of this chapter is based mainly on Leibenstein's (1957) theory, as it appears to classify utilities and disutilities of having children in a very clear and straightforward way. Leibenstein (1974), however, was later dissatisfied with his own theory, as well as with large portions of economic theorizing on fertility by other authors. Leibenstein (1974) is of the opinion that the role attributed to rising direct and indirect costs in causing a negative relationship between income and fertility has been overestimated. First of all, he argues that differences in education costs between low and high income families are likely to be irrelevant, since education is largely publicly financed. Secondly, he holds that marginal babysitting costs for an additional child are often negligible (again, Leibenstein (1974) only wants to explain transitions to higher order children, taking it for granted that people have at least a few children). Given low marginal babysitting costs, he does not believe that opportunity costs for mothers would be large enough to have a negative effect on fertility.

Neglecting babysitting costs may however be misleading. Costs can be very high, especially if there is no public childcare infrastructure. Therefore, determinants and implications of opportunity costs will be discussed in this chapter, in section 2.3. The controversy over the relationship between direct costs of children and parents' income will be reviewed in section 2.2, including Leibenstein (1974) theory. Leibenstein (1974) especially emphasizes the effect of income on values and consumption patterns.

income is higher. However, it has often been argued that preferences or obligations concerning standards of maintaining and educating children rise with income as well, so the effect of income on fertility decisions need not necessarily be positive.

Becker (1960) has advocated effects in both directions. In his 1960 publication, Becker argues that parents with higher income have a demand for higher “quality” children. By “quality” he means the sum of all investments and expenditures on children. He argues that with higher income, both the quality and quantity of children demanded by parents should increase, though increases in demands for quality may be greater. That no straightforward positive relationship between income and number of children is observed he attributes to lack of knowledge about contraception among lower income groups. If contraceptive knowledge were evenly spread, he would predict a positive effect of family income on number of children. By contrast, in the more recent version of his theory on the demand for children, published in ‘A Treatise on the Family’ (Becker 1993a), he expects a negative effect of income on family size. He postulates an interaction between the prices for quality and quantity of children. He sees this interaction to be primarily responsible for a negative effect of income on family size. While Becker (1993a) reviews previous literature and acknowledges that opportunity costs for women are likely to be an important cause of fertility decline, in his opinion, as expressed in the chapter ‘The Demand for Children’ (chapter 5 in ‘A Treatise on the Family’), the presumed interaction between the quality and quantity of children demanded is the most important factor in explaining the negative relationship between family income and number of children:

“The economic approach suggests that a negative relation between income and fertility is an indication that the effective price of children increases with income, perhaps because the wives of men with higher incomes tend to have greater potential earnings from market activity (Mincer, 1963) or higher values of their time (Willis, 1973). I believe, however, that the interaction between the quantity and quality of children is the most important reason why the effective price of children rises with income.” (Becker 1993a, p.144)

In the last chapter of ‘A Treatise on the Family’, called ‘The Evolution of the Family’, Becker (1993b) draws together conclusions from previous chapters to broadly outline their implications for understanding the development of the family across the distant

and near past. The main factor Becker (1993b) sees to cause a negative relationship between income and fertility has shifted between chapter 5 and the concluding chapter 11:

“I believe that the major cause of these changes is the growth in the earning power of women as the American economy developed. [...] A growth in the earning power of women raises the labor force participation of married women by raising the forgone value of time spent at nonmarket activities. It also raises the relative cost of children and thereby reduces the demand for children because children require much time of their mothers (see the extended discussion in Chapter 5). Statistical studies (Butz and Ward, 1979b; Ward and Butz, 1980) suggest that the growth in the earnings and labor force participation of women have been important causes of the significant decline in fertility since 1957.” (Becker 1993b, p.350-352)

Especially, the reference to chapter 5 is surprising, because opportunity costs are not the subject of chapter 5. In reviewing previous literature, they are briefly discussed, but the argumentation in chapter 5 focuses on the interaction between the prices of quality and quantity of children, which in that chapter is seen to be the main cause of a negative relationship between income and fertility.

Becker (1993a), in chapter 5 of ‘A Treatise on the Family’, expects a sort of chain reaction to take place as soon as there is a slight increase in the fixed cost per child, or as soon as the marginal relative to average cost of quality decreases slightly<sup>4</sup>. The theory is that parents will want the same amount of quality for all their children, thus the cost of quality rises with the number of children. As soon as the marginal cost of quality decreases slightly and parents therefore decide to have one child less and purchase more quality instead, the price of quality drops further, since it is proportional to the number of children. This again raises the demand for quality, since it is now available at a lower price, and so on. In this manner, a small initial decrease in

---

<sup>4</sup> Because of the special nature of the interaction between quality and quantity, in order for parents’ demand for child quantity vs. quality to change, changes have to take place in the fixed cost per child or the marginal relative to average cost of quality. Without these special components of the prices for quality and quantity, general prices for quality and quantity could not be stated independently of one another. An increase in the price of quality for a constant number of children would always imply the same proportional increase in the price of child quantity, and vice versa. In that case, parents’ demands for quality as opposed to quantity could only change if there were initial external changes in the quantity or quality of children.

the marginal cost of quality is seen to have the potential to cause large declines in the number of children demanded.

Becker's (1993a) theory of the interaction of the prices for quality and quantity of children rests on the assumption that people have preferences for the number of children on the one hand, and the quality per child on the other hand (independent of the number). This assumption is perhaps not necessarily intuitive. One could, in contradiction to this assumption, for instance imagine that if someone has two children for whom a greater amount of education suddenly becomes available, this person would have more of a utility gain than if he or she only had one child for whom that same amount of education suddenly became available. For the theory of the interaction of the prices for quality and quantity of children, Becker (1993a) however needs to assume that the utility gain in either case is the same.

To explain the negative relationship between income and fertility, Becker (1993a) focuses on differences in returns to education. He argues that higher returns to investments in education (in other words, lower marginal costs of child quality) can via the interaction between quality and quantity strongly decrease fertility. Increasing returns to investments in education typically accompany economic development. Therefore, fertility will be lower at higher levels of economic development. Higher income groups within one society at one point in time would then only have lower fertility if income is systematically linked to rates of return to investment in education. If certain groups in society who have low levels of income are at the same time excluded from possibilities to make worthwhile investments into education for their children, this then can lead to large fertility differences via the quality-quantity interaction Becker (1993a). These mechanisms could give an explanation for a general negative effect of income on fertility. However, they cannot explain why usually only women's income is found to have a negative effect on fertility, while men's income most frequently is found to have a positive effect. Simple opportunity cost explanations may fare better at explaining these patterns. It appears that Becker (1993a) never actually had the intention of developing a general theory of the relationship between income and fertility, but rather to relate differences in opportunities for worthwhile investments in children to fertility outcomes.

If the quality-quantity interaction leads to lower fertility for high income groups who have access to better returns to educational investments, then income should generally be negatively related to fertility. However, as pointed out early in the

chapter 'The Demand for Children' by Becker (1993a) himself, most empirical studies have found a positive effect of men's income on fertility, once women's income or educational attainment has been controlled for<sup>5</sup>. An early study by Mincer (1963) has shown this for the United States. Using cross-sectional household-level data for 1950, as well as three different samples of area average data for 1950 and 1940, he demonstrated that a positive effect of men's income on family size results if women's income is controlled for. Earlier studies had found no effect or negative effects of additive family or husband's income on fertility. Mincer (1963) argues that this was due to misspecified models which had omitted controls for women's income, which are likely to be related to opportunity costs of childbearing.

Espenshade (1972) summarizes some early studies on the relationship between income and fertility. He names a study by Cain and Weininger (1973), published as a discussion paper in 1970, as one of the earliest studies involving discussions of opportunity costs and the possibility of negative effects of men's income on fertility. Cain and Weininger (1973) use small-scale macro-data for the United States to investigate the relationship between male and female income and fertility. Their units of analysis are standard metropolitan statistical areas in 1960, and cities in 1940, though the focus is mainly on 1960 because of the better quality of the data available for that year. For men, they use the median male income of a standard metropolitan statistical area (SMSA). They also derive an estimate of the median income available to women in an SMSA if they were to work 52 weeks a year. The dependent variable is the average total number of children per ever married woman in an SMSA. Cain and Weininger (1973) find a positive effect of men's median income, and a negative effect of the estimated level of income available to women, on fertility in an SMSA. This is in line with the hypothesis that opportunity costs are important determinants of fertility for women. The positive effect of men's income supports the idea that fertility is generally positively related to men's income, because of the better affordability of expenditures on children for men with higher levels of income. It contradicts the idea that expenses for children rise along with income, lowering the demand for children.

It seems that there have not been many recent studies of the effect of men's income on fertility. The majority of more recent research is on the relationship between women's characteristics and fertility. Studies including men have focused on men's

---

<sup>5</sup> But, as mentioned above, it seems that Becker (1993a) aims to explain why negative relationships between income and fertility can occur; it is not his standpoint that they will always occur.

educational attainment and labor force participation. An exception is a study by Huinink (1995a). Huinink (1995a) has found a positive effect of men's income on first birth risks for Germany. Comparing cohorts 1939-41 and 1949-51, he finds a stronger income effect for the younger cohort. There are no major changes to these income effects when the spouse's level of education and employment are controlled for. Kreyenfeld (2005) also finds a positive, though non-significant, effect of men's income on first birth risks for Germany.

A controversial point has been whether parents with higher income actually prefer spending more per child, or whether it is somehow a matter of obligation (Cain and Weininger 1973). If the reason for greater expenditures per child is that parents attain higher utility by increasing their children's education and standard of living, for example, it would not be quite accurate to speak of rising costs. Parents would still be getting good returns for their money, and the demand for children would not decrease with income, despite rising expenditures (Becker 1960). On the other hand, it could be the case that higher expenses per child are in some way forced upon parents who earn more. Some have argued that there is normative pressure on parents with higher levels of income to spend more on their children. Others have pointed out that parents' own standard of living is inseparably linked to their children's standard of living. In either of these cases, parents would not be obtaining additional utility out of spending more per child. Instead, costs would be higher for the same amount of utility, and the demand for children would decrease (Duesenberry 1960; Okun 1960).

Connected to this discussion, there have been some efforts to develop more precise hypotheses on how higher income could be related to preferences or expectations to spend more on one's children. One idea is that child expenditure standards form within occupational groups. Then, the effect of income on fertility should be positive within occupational groups, but not across occupational groups. Bernhardt (1972) has tested the hypothesis of a positive income effect within occupational groups for Sweden. For first births, however, she did not find a positive effect for every occupational group. Men's income proved to have a positive effect for manual workers, and for all occupational groups taken together. For non-manual workers with and without advanced education, as well as for farmers and farm laborers, there was no straightforward effect of men's income on the probability of having a first child. This appears to contradict the idea that men's relative income within occupational

groups is important for decisions to have a first child. Rather, there seems to be a general positive effect of men's income on first births.

Leibenstein (1974) argues that social pressure to spend more, not on children, but on consumer goods, rises with income. He holds that people tend to be influenced in their spending ambitions by values held among others in their general income class. There are certain consumption goals that are generally accepted in these groups. The closer one is to reaching these consumption goals, the more utility one tends to get out of additional units of consumption. In other words, across some intervals, people actually have increasing, instead of declining, marginal utility of consumer goods. In addition, consumption goals in relation to income are higher for higher income groups than for lower income groups. At a point where lower income groups are already past their consumption goals and are experiencing declining marginal utility for additional units of consumption, higher income groups are still experiencing increasing marginal utility of consumption, and at some point decide against an additional child, whereas lower income groups at this point attain more utility from an additional child than from additional consumption.

Another approach relating income relative to one's level of aspiration, instead of absolute level of income, to fertility decisions, is Easterlin's theory of the effect of generation size on the ability to attain the standard of living one has become accustomed to as a child (Easterlin (1987)). Easterlin (1987) holds that generation size is a crucial factor determining a person's opportunities in life. Members of generations that are small relative to preceding generations encounter favorable conditions when entering the labor market. Because of the small size of their generation, the demand for young workers is high. By contrast, if one is a member of a large generation, job opportunities are bleak. People evaluate their material well-being in relation to what they are accustomed to from their parents. Even if entry-level incomes increase from generation to generation in absolute terms due to general economic growth, parents' incomes will also have grown. Entry-level incomes will almost always be smaller than one's parents' level of income a few years before one leaves home. How much smaller they are however can vary from one generation to another. The relation of own income to parents' income will be smaller for generations whose size is relatively large and for whom labor market opportunities are small. Therefore, members of large generations will evaluate their material situation in early working life more negatively and be more hesitant to have a large family. For this reason, their children then will be

members of a small generation, view their economic situation more positively when entering the labor market, and feel prepared to support a larger family. In this way, Easterlin (1987) expects generation size to vary in a wave-shaped manner. Especially, in this manner, he aims to explain the development from the baby boom to the baby bust between the 1950s and 1970s in the United States. To support his theory, Easterlin (1987) provides data on the development of young people's income relative to their parents' income as well as data on relative generation size, which he shows to both parallel general fertility development. Easterlin (1987) especially attributes explanatory power to men's relative income. He does not see women's income as having a genuine role in determining fertility. He argues that women's incomes were actually higher during the baby boom years when fertility was high and female employment low. Instead of assuming that female employment has a negative effect on fertility, he assumes that higher female employment itself is caused by women having to work when their husband's incomes are low.

Easterlin's (1987) theory is a theory on the cause of fertility variation between generations, not on fertility difference among members of the same generation. However, population size is not the only factor that determines one's level of income relative to one's parents'. Easterlin's (1987) theory could therefore be adapted to predict effects of relative income on fertility within one generation. Effects of income relative to the couple's families of origin's level of income could modify effects of simple measures of income.

The discussion in this chapter so far is based on the male breadwinner model of the family. If men, too, faced opportunity costs of parenthood because of childcare obligations, the causal relationship between men's earnings and fertility decision-making would be different. This might even lead to a negative effect of men's income on decisions to have a child. There are some accounts of more egalitarian attitudes among men in younger generations. For example, Carr (2002), analyzing results from a survey conducted in 1995-1996 in the United States finds that younger men have lower perceptions of work opportunities, but higher levels of self-acceptance when they make work-family compromises. However, there has only been little evidence so far of an actual increased tendency of men to make compromises to reduce their amount of time spent at work to care for children. Kaufman and Uhlenberg (2000) find using a cross-sectional sample for 1992-1993 for the United States that fathers are more likely to be employed and to work more hours than childless men. They do

find a negative effect of egalitarian attitudes on work hours for fathers under age 35 in their sample, but not for fathers above 35 years of age. But, even egalitarian younger men work substantially more hours when they are fathers than when they are not.

In an analysis of data from the PSID for the years 1980 to 1992 for the United States, Lundberg and Rose (2000) find that when women interrupt their work after the birth of a child, their husbands' earnings as well as hours at work increase. If the wife works continuously, the husband's work hours tend to decrease, but at the same time, his income increases. This might indicate that even if men make work-family compromises, these are not necessarily connected to opportunity costs.

Rost (2002) describes results from a qualitative study in Germany. Twenty-five couples with children, where the mother earned more or the same amount as the father, were interviewed. The idea behind the study was to investigate whether relative income is a key predictor of parental role division. Indeed it was found that these couples' childcare patterns strongly diverged from the standard pattern, by which the mother is primarily responsible for childcare and interrupts employment. Instead, these couples tended to divide parental leave evenly, so that neither partner had to interrupt employment for a longer time-period. So, it seems that, at least according to the results from this qualitative study, relative income is an important predictor of the allocation of childcare in the household. However, couples with equal levels of earnings, or even where the women's earnings are higher, are likely to still be very rare.

This section has summarized the debate on the direction of the effect of men's income on fertility. Men's income and career resources will be important variables to include in models of transitions to the first child in Great Britain and western Germany. In both countries, mothers tend to reduce or interrupt employment for extended periods of time, as will be discussed in chapter 5. Therefore, men usually not only have to support their child, but their partner as well when becoming fathers. Together with expenses for more spacious housing, this sums up to high basic costs of children. While it seems plausible that expenses for children have increased over time parallel to rises in per capita income, there is not so much reason to believe that costs of children are vastly different for different income groups in contemporary European societies. There is also little evidence of emerging opportunity costs for men, as discussed above. Therefore, I would expect men's income to have a positive effect on first birth risks in both countries. As will be argued in chapter 4, public financial support for male breadwinner families is however greater in western Germany. Also, income in-

quality is higher in Britain, as pointed out in chapter 5. For these reasons, one can expect the effect of men's career resources and position in the income distribution to be greater in Britain than in western Germany.

### **3.2.3 Women's income and fertility decisions**

The opportunity cost argument holds that, given the traditional division of labor where women focus mainly on childcare, motherhood involves income opportunity costs for women. These are greater the higher the woman's income. Therefore, there should be a negative effect of women's income on fertility decisions (Leibenstein 1957; Mincer 1963; Cain and Weininger 1973). However, as pointed out by Leibenstein (1974), women with higher levels of income can also better afford childcare, which would conversely lead to a positive effect of income on fertility. For similar reasons, Macunovich (1996) has advocated using models that let the net effect of female wages vary over time in order to account for changes in the availability and acceptability of childcare. A different idea might be that there could be a U-shaped effect in countries where costs of childcare are high. Among women who cannot afford childcare, across the first segment of the income scale, there would then be a negative effect of income on fertility, because opportunity costs would be lower for those with low than for those with medium incomes. Then, for the second part of the income scale, among women who can afford childcare, there would be a positive effect, because those with higher income have more income left over after paying for childcare. The additional utility they could have gotten out of the income they used to pay for childcare is lower than in the case of those with medium income; therefore those with very high income would be more likely to decide to have a child than those with medium income. For related but much more sophisticated reasons, Ermisch (1989) also concludes that the effect of women's wages could become less negative or more positive as wages increase. In both Great Britain and western Germany, availability of moderately priced public childcare is low. This could lead to a U-shaped effect of income on fertility, since privately organized childcare is expensive. Use of childcare is also likely to depend on its social acceptance. In western Germany, social acceptance is lower than in Britain. It has grown somewhat in recent years but remains at a low level (Scott 1999; Geisler and Kreyenfeld 2005). This is discussed in more detail in chapter 4. For west-

ern Germany one could therefore have reason to expect a negative relationship between women's income and fertility throughout, if few people are willing to use childcare for young children.

In any case, it will be important to gain a picture of actual determinants of opportunity costs of childbearing. It will be interesting to see whether these actually increase with income, as assumed in the traditional theoretical considerations outlined above. Therefore, this section will first review empirical research on opportunity costs of childbearing, in order to be able to base assumptions about anticipated opportunity costs and their effects on decisions to have a first child on actual patterns of opportunity costs. Next, empirical research on the effects of educational attainment and labor force participation on transitions to the first child will be discussed, since these variables are often used as proxies for income. It seems that income itself has not been used as often as a predictor of women's fertility decisions, at least not on the individual level. In the last part of this section though, a few studies that have used women's income as an independent variable will be reviewed.

### **3.2.3.1 Estimates of opportunity costs of childbearing**

Several different components are usually seen to make up the opportunity costs of motherhood. As shown in Joshi (2002), children affect women's present earnings by increasing rates of part-time employment and non-employment, and future earnings because of reduced work experience. Some empirical studies reviewed in this section have concentrated more on wage differences between mothers and childless women, while other have attempted to estimate life-time opportunity costs of childbearing.

Waldfogel (1997) finds in a study of women in the United States, using data for the years 1968-1988, that part of the wage penalty for motherhood is due to higher degrees of current part-time employment, as well as longer times of previous part-time rather than full-time work experience. Even after controlling for work experience, unobserved heterogeneity, and human capital variables, a wage penalty for motherhood remains.

Budig and England (2001) present results showing that the wage penalty for motherhood is partly explained by differences in experience, human capital variables, and part-time working status. Other job characteristics are found to have hardly any

effect at all. Their study is also on women in the United States, between the years 1982 and 1993.

Harkness and Waldfogel (1999) find higher wage penalties for mothers in the UK, followed by Canada, Australia, the United States and Germany, than in Sweden or Finland. For the first child though, wage penalties appear to be lowest for Germany. These results are only for wages, not for life-time earnings. The study only includes women who are actually working. German and Australian women were the least likely to work. That German mothers who were working had such a low wage penalty most likely has to do with the more regulated labor market and lower level of overall wage dispersion in Germany than for instance in the UK.

In a study comparing a cohort of British women born in 1946 to a cohort born in 1958, Joshi, Paci, and Waldfogel (1999) find that the gap in wages between mothers and women without children in their early 30s was not very different in the two cohorts. However, the relative importance of factors responsible for the wage gap had changed. In the older cohort, the pay gap was due more to differences in level of education between mothers and childless women. In the younger cohort, the proportion of the pay gap that could be explained by part-time work had increased. The gap in pay between part-time and full-time working women, controlling for human capital, had also increased between the two cohorts. The importance of labor market experience for the level of wages had increased as well, and differences in experience explained more of the wage gap between mothers and childless women in the younger than in the older cohort. An interesting result reported by the authors is that in the younger cohort, there is no wage penalty for motherhood if mothers work full-time with an employment interruption of no more than 12 months around birth.

Joshi (1990) uses a cross-sectional survey of British women in 1980 to estimate earnings functions of mothers and women without children by age. She finds a considerable wage penalty for motherhood. As for life-time earnings, the result of a simulation is that a woman with two children has only 43% of the life-time earnings of a woman without children. Further simulations based on 1980 data, described in Joshi (2002), gave evidence that life-time opportunity costs in Germany and the Netherlands were very similar to those in Britain, while life-time opportunity costs were much lower in France and Sweden.

In a more recent study, Joshi (2002) reports simulations of life-time earnings for women with no children and mothers with different numbers of children, based on

1994 data for Britain. Women with low education are found to have the highest, and women with high levels of education are found to have the lowest levels of opportunity costs for childbearing. This appears to be largely due to quick returns to paid employment by highly educated women after having children. None-the-less, highly educated women are the least likely to have children. In contrast to this finding, Waldfogel (1997) finds a higher wage penalty for women with higher levels of education in the United States.

Thus it seems that evidence of higher opportunity costs for women with higher levels of education and higher earnings is not undivided. Opportunity costs of childbearing depend on leave times and the amount of time spent in part-time employment, and these may be shorter for women with higher education and earnings. Bender, Kohlmann, and Lang (2003), (described in more detail in chapter 5) for example, show that in Germany, mothers with a university degree have higher return hazards to work than mothers with vocational training, and that those with high or relatively low wages have higher return propensities than those with medium wages. This should put into question assumptions about a simple link between women's earnings and fertility via a straightforward translation of earnings into opportunity costs.

Research on return patterns of mothers to employment, as well as on part-time employment rates and wages for part-time employees, is reviewed in the chapter on the British and the West German labor market (chapter 5). Generally, the duration of time that mothers spend outside the labor market has been found to be greater in western Germany than in Great Britain. In both countries, among employed mothers, part-time rates are very high in international comparison. Slower returns to the labor market by West German mothers may lead to higher life-time opportunity costs of childbearing. On the other hand, lower wages for part-time employees in Britain than in Germany can have the opposite effect.

### **3.2.3.2 Research on the effect of education and employment on transitions to the first child**

Education and labor market status are strongly correlated to income, and their effects on decisions to have a first child can perhaps give some insight into the empirical relation between earnings and fertility. Francesconi and Golsch (2005) find a negative

effect of educational attainment on transitions to the first child for women in Great Britain for the time period of the 1990s. Women who had O-level (ordinary level) degrees or less had about twice the odds of making a transition to first birth the next year compared to those with A-level school degrees (advanced level, qualifying for higher education) or post-secondary degrees. However, the odds for women with vocational degrees were only about 30% higher than for those with A-levels or post-secondary degrees. Being unemployed or out of the labor force, in turn, are both found to have strong significant positive effects on first birth transitions. Working part-time also has a positive effect on transitions to first birth for women. Rendall and Smallwood (2003) also find higher levels of childlessness in 1998 among women with post-secondary education (22.5%) than among those without (15.2%), for women born in 1954-58 in England and Wales.

Kreyenfeld (2005) finds a negative effect of level of education on first birth risks for Germany as well. However, in contrast to Britain, there is no general effect of unemployment or part-time employment on first birth risks. An interaction between employment status and education, though, shows that unemployment has a very strong negative effect for women with a high level of school education (Abitur), no effect for those with medium education (Realschulabschluss), and a positive effect for those with low education (Hauptschulabschluss). Kurz, Steinhage and Golsch (2005) also find a negative relationship between level of educational attainment and first birth risks for Germany. However, for the highest educational group in this model, for those with a technical college or university degree, first birth risks rise again somewhat compared to the next lower groups, those with more than compulsory education and an occupational qualification. They argue that this may be due to a time-squeeze effect, elevating first birth risks for those who finish education the latest. They do not include an interaction effect between employment and education and do not find any general effect of unemployment either. However, they do find a positive effect of part-time employment.

At least to some extent, in both Germany and Great Britain, the level of educational attainment seems to have a negative effect on transitions to first birth. This could point to an effect of anticipated opportunity costs on decisions to have a first child. But, in the interaction model between educational attainment and employment, Kreyenfeld (2005) finds a negative effect of education for the unemployed only. There is no effect of level of school education for the full-time employed, while

among the unemployed, those with low education have a 3.4 times higher risk of first birth than those with a high level of education. This seems to make a straightforward interpretation in terms of opportunity costs more difficult. One would especially expect those who are employed to make considerations with respect to the opportunity costs of childbearing by taking their level of education into account. It could of course be the case that those with very low education who are additionally unemployed have extremely low opportunity costs of childbearing. This could explain why they have the highest first birth risks of all. A different interpretation, as argued by Kreyenfeld (2005), would be that people in such an insecure situation with few perspectives in the labor market decide to have children in order to introduce structure to their lives, as proposed by Friedman, Hechter, and Kanazawa (1994). In sum, for Great Britain and Germany, the negative effect of education on first birth risks was usually found to be quite small, and in the case of Germany, non-existent for those who were employed full-time. This could however be related to a time-squeeze effect for those with university degrees. This will be discussed in more detail below, in section 3.4 on fertility timing.

In Germany, unemployment does not seem to represent an incentive to have children for those with high education (Kreyenfeld 2005). For them, instead, being employed seems to be a very important precondition for becoming a parent. This could indicate that highly educated women in Germany do not intend to completely leave the labor market after becoming mothers, but plan at least at some point to continue supporting the family through their employment. For Great Britain, on the other hand, none of the studies included an interaction effect between education and employment, so we do not know if the general positive effect of unemployment holds for all educational groups, or only for those with low education as was found to be the case in Germany.

### **3.2.3.3 Empirical research on the effect of women's income on fertility**

Two early studies named above, Mincer (1963) as well as Cain and Weininger (1973), find empirical evidence of a negative relationship between women's earnings and fertility for the United States. Mincer (1963) uses household-level data as well as small-scale area data, and Cain and Weininger (1973) also use area-level data. Subsequently

though, it seems that the focus moved away from household or at least small-scale aggregate studies towards analyses of macro-level time series data. Much discussion was centered around a study by Butz and Ward (1979).

Butz and Ward (1979) note that since the 1960s, the total fertility rate in the United States has been developing in a counter-cyclical fashion, in divergence to the pattern of pro-cyclical fertility that had thus far consistently been observed, for example by Thomas (1925) for Great Britain and Silver (1965) for the United States. Butz and Ward (1979) aim to show that this new pattern of counter-cyclical fertility can be accounted for by a negative effect of female wages on fertility and rising female employment. They develop a model for the effects of aggregate age-specific measures of female wages, female employment, and male annual earnings on age-specific fertility rates. In this model, the effects of the aggregate measures of female wages depend on the female employment rate. Their estimates show a negative effect of female wages on fertility rates for age groups 20-24 and 25-34, and a positive but non-significant effect for age group 35-39. Male annual earnings have positive effects on fertility rates in each age-group. The authors are able to get a good fit for 1948-1975 fertility time series for age-group 20-24, and also achieve good predictions of the level of fertility for this age group for part of the time series based on model estimates for the other part of the time series. Predictions for the other age groups are not shown. To summarize, then, Butz and Ward (1979) are able to show that female wages have a negative effect and male annual earnings have a positive effect on fertility, at least at the aggregate level. The result for female wages no longer holds for the oldest age group, but, as they argue, the reason could be that economic factors become less important near the end of a family's childbearing phase. Either they have already reached their desired family size, or if they have not, they no longer have much choice with respect to timing. At least for the youngest age group, the pattern of counter-cyclical fertility can be accounted for by their model. However, it remains unclear whether the correlations between female wages, male earnings and fertility would also hold at the individual level, and whether individual-level correlations, too, could account for the pattern of counter-cyclical fertility.

Macunovich (1995) reexamines the estimates presented by Butz and Ward (1979). Macunovich (1995) finds that the model by Butz and Ward (1979) does not produce estimates that fit the time series if the years 1947-54 are excluded. In other words, the general results depend on the inclusion of data for 1947-54. Macunovich

(1995) points out that between 1947-54, there was practically no trend in female wages or labor force participation, so this could not have had any effect on fertility development. For the time after the year 1954, the model only produces insignificant results, or coefficients with signs opposite to the ones originally hypothesized and achieved by Butz and Ward (1979). Furthermore, Macunovich (1995) points out that Butz and Ward (1979) had greatly overestimated increases in female hourly wages. No direct measures of female hourly wages were available at the time, so Butz and Ward (1979) developed a very crude estimate. In particular, they made use of a non-sex-specific measure of hours worked per week for employees in the retail trade which reflected a general trend of declining working hours, as a proxy for the general development of female working hours. Macunovich (1995), using CPS data however shows that for women, hours worked per week were rising. Therefore, according to Macunovich (1995), Butz and Ward (1979) achieved a false estimate of rising hourly wages for women. When using more precise measures of female hourly wages based on CPS data for 1964-1987, Macunovich (1995) attains a very poor fit for the time series data from the Butz and Ward model, and the coefficients generally do not have the hypothesized signs or are insignificant. Thus, it seems to be questionable whether rising female wages really can account for fertility declines. At least at the aggregate level, it appears to be difficult to attain stable results.

Andersson (2000), by contrast, estimates a micro-level model of the effect of female earnings on fertility, and examines to what extent compositional changes can explain macro-level trends in fertility. Andersson (2000) provides evidence for a pattern of pro-cyclical fertility in Sweden between 1986 and 1996 for women born between 1945 and 1979. The Swedish economy was characterized by a period of growth in the second half of the 1980s, and by an economic downturn during the first part of the 1990s. Using individual-level register data, Andersson (2000) shows that first, second, and third birth risks increased in the period of economic growth between 1986 and 1990. Second and third birth risks as well as first birth risks for women in their twenties then decreased during the economic downturn from 1990 to 1996. However, there was not much change in first birth risks for women in their thirties in the first part of the 1990s.

Looking at the influence of individual-level economic factors, Andersson (2000) finds a positive effect of women's earned income on first birth risks, both for women in their twenties and in their thirties. For the younger group of women,

though, those in the highest income group again have slightly lower first birth risks than those in the second-to-highest income group. A part of the change in first birth risks across time can be explained by compositional changes, by changes in the proportion of women belonging to each income group. After 1990, during the economic downturn, more women belonged to groups with low annual earned income. This was due mainly to an increase in the proportion of students and of the unemployed. Not all of the change in first birth risks over time, that followed the economic development in a pro-cyclical manner, could however be explained by these compositional changes. A possible additional cause of the pro-cyclical fertility pattern may be a general atmosphere of economic insecurity during times of economic crisis, independent of individual economic factors (Andersson 2000).

For Finland, Vikat (2004), studying cohorts 1944-1980 during the time period 1988-2000, also finds higher first birth risks for women with higher levels of earnings, both for women between 20 and 30 and for those between 31 and 44. Including an interaction between education and earnings shows that for women between 20 and 30, there is a pronounced positive earnings effect for those with more than compulsory education, but no effect for those with only compulsory education.

For Norway, Kravdal (1994) finds no clear effect of wages on first birth risks for cohabiting or married women born in any of several cohorts between 1945 and 1968, for the time period up to 1988/89 or their 30<sup>th</sup> birthday. The author uses two alternative measures for wages. For cohabiting or married women, the first measure produces only small effects and no clear pattern, while the second measure shows a slight non-significant bell shaped effect. For single women, wages by both measures have negative effects on first birth risks, though this is only significant for one of the measures.

Because of the generally good provision of childcare in Scandinavian countries, one would expect the compatibility of work and parenthood to be quite good and opportunity costs of having children to be quite low. Therefore, there is little reason to expect a negative effect of women's income on fertility. Instead, one might even expect a positive effect, because higher levels of earnings make it easier to support a child. Especially though, the specific type of regulation for maternity pay should lead one to expect a positive effect of women's earnings on fertility. In Sweden, Finland, and Norway, the height of maternity pay is dependent on previous earnings, so a plausible effect would be that women wait until their earnings are high enough before they

decide to have a child. For Sweden and Finland, the studies named above did indeed find a positive effect of women's income on first birth risks. For Norway though, Kravdal (1994) found no positive effect of women's earnings on first birth risks. A reason could be that part of the time period covered by this study lies before the reform of maternity pay to income replacement in 1978. Also, until the early 1990s, maternity leave was much shorter in Norway than in Finland or Sweden (Rønsen and Sundström 2002).

In contrast to Sweden or Finland, there is not much evidence of positive income effects for Great Britain or western Germany. Kreyenfeld (2005) found no general significant effect of women's income on transitions to first birth for Germany. In a model including an interaction effect with education, there was a positive effect for the highly educated that was stronger in magnitude, but still non-significant. Ermisch (1989), using British data for 1980, finds a negative effect of women's wages on fertility, but the negative effect becomes less strong as wages increase. He also predicts that the effect of women's wages on fertility could even become positive if childcare costs are low. These findings are attained by estimating a model developed by Ermisch (1989) to predict family size at 10 and 15 years of marriage for women in Britain. He employs estimates of women's potential wages at marriage, of husband's earnings 25 years after leaving education, as well as their predicted use of childcare, based on women's and men's income data and childcare use in 1980, their levels of education, their marriage cohort, and women's work history information. The model by Ermisch (1989) is a model for total family size, so it is difficult to infer implications for effects of women's wages on first births. Also, the data on wages and use of childcare are basically cross-sectional, although model estimates are used to predict their values at other points in the life-course. Nevertheless, it is an interesting finding that the effect of wages becomes less negative as wages increase and childcare becomes easier to afford.

I have not heard of any recent findings of effects of women's income on first birth risks for Great Britain. However, as described above, Joshi (2002) reports low opportunity costs of childbearing for highly educated women, referring to a simulation based on 1994 data. Compared to the very high opportunity costs of childbearing estimated based on 1980 data (Joshi 1990), this may indicate a changing relationship between women's income and fertility.

### **3.3 Work characteristics**

While income is likely to be one attribute that influences fertility decision-making, other work characteristics can be very important as well. The number of hours one works, normative expectations, occupational prestige, and work autonomy particular to one's occupation, the size of the organization where one works, whether it is a public or a private sector organization, whether one is self-employed, how much work experience and employer tenure one has, are all characteristics that may on the one hand be related to opportunity costs of giving up work, and on the other hand to the compatibility of working with bringing up children. In addition, they may also be indicators of job stability and job prospects that can be important for considering how well one is able to support a family.

This section will first discuss the availability of family-friendly arrangements by job characteristic such as public sector employment, firm size, and type of occupation. Then, research on potentially negative consequences of using family-friendly arrangements will be reviewed. If making use of family-friendly arrangements has negative consequences for one's future employment career, their availability may not have as much of a positive effect on decisions to have a child as one might initially expect. Next, empirical research on actual effects of occupation and work characteristics on fertility is discussed, followed by a short discussion of the possible influence of self-selection into jobs with particular family-friendly characteristics.

#### **3.3.1 Family-friendly arrangements by work characteristics**

It appears that there has been more research on factors associated with family-friendly work arrangements, such as possibilities to work part-time, to take additional maternity leave, or to make use of flexible working hours, for Great Britain than for Germany. Occupation seems to be one important factor for predicting the availability of family-friendly arrangements. Women working in occupations requiring higher levels of qualification have been found to have better access to family-friendly work arrangements. Evans (2001) summarizes research by Forth et al. (1997) stating that entitlement to family-friendly arrangements in Britain was most common for women

working in professional, managerial, and associate professional occupations. Evans (2001) also quotes Cully et al. (1999), who likewise report that family-friendly employment schemes are more often available to higher-skilled employees, as well as Hakim (2000), who argues that higher-skilled staff are less likely to take advantage of career breaks, despite greater eligibility. On the other hand, flexibility for lower-skilled employees does not often seem to be beneficial for work-family compatibility. Evidence for this has at least been found from studies for the United States. For example, in a study of lower-skilled jobs with large Chicago employers, Lambert and Haley-Lock (2004) find that when employees work reduced hours, this often introduces instability rather than flexibility into their lives. Low-skilled employees are often only given short notice of schedule changes, and therefore need to set up full-time childcare, even if they are only paid for reduced hour weeks.

Firm size and sector may also determine the extent to which employers can offer family-friendly employment schemes, such as part-time employment, parental leave, or flexible working time. Especially for Great Britain, supplementary parental leave agreements between employers and employees may be important, since legal regulations only cover a very short period of paid leave, and it is customary for firms to supplement statutory maternity leave. It has been reported that larger organizations as well as public sector employers are more likely to offer family-friendly work arrangements. Evans (2001) reports findings by Forth et al. (1997) that public sector employers as well as larger employers provide more family friendly work arrangements and benefits than smaller or private sector employers in Great Britain. For Britain, den Dulk (2005) also finds significant differences in the number of family-friendly arrangement provided by employers in the profit vs. the nonprofit sector and also between employing organizations of different size. The most important explanatory factor was sector, with a strong positive effect of belonging to the non-profit sector. Firm size also had a positive, though smaller effect.

Several studies, mainly on the United States, have reported a positive relationship between motherhood and self-employment. Connelly (1992), using data referring to 1984, finds a positive effect of motherhood on being self-employed, and especially on being a self-employed child-care provider. Hundley (2001) analyzes data for the United States for 1997. He finds that women who are self-employed work less hours for their job, and put in more hours for housework, while the relation is opposite for men. The difference between men and women in this respect increases with the num-

ber of children. It is found that women who are self-employed report less interference of work in the home, have higher job satisfaction, and less job burnout. The author shows that the lower degree of 'job-to-home spillover' among self-employed women can be accounted for by less working hours, greater work autonomy, and a greater propensity to have home-based work. Self-employed men, by contrast, have greater degrees of 'job-to-home spillover', higher job satisfaction, but no differences in earnings or job burnout compared to men who are employees. Taniguchi (2002) studies transitions into self-employment among women born between 1957 and 1964 in the United States, during the time period from 1979 to 1993. She finds that young children have no effect on transitions into self-employment, while older children have a positive effect on transitions into regular employment as well as self-employment, but there is no significant difference between these two effects.

None of these studies give any direct evidence of an effect of self-employment on fertility. However, as suggested by Taniguchi (2002), the positive effect of children on the probability of being self-employed found in cross-sectional studies may have resulted from a positive effect of self-employment on transitions to motherhood. This could especially be the case since, in the longitudinal study by Taniguchi (2002), there is no evidence of a positive effect of children on transitions into self-employment. Also, the study by Hundley (2001) seems to indicate that self-employment is more compatible with childcare activities, although it does also seem to foster a traditional division of labor.

All of these studies, though, are on the United States. The nature of self-employment may be very different in Europe, especially in Germany, because of its very differently structured labor market. This may be reflected in the finding by McManus (2004) that mothers of young children take up self-employment for short periods of time in the United States, but not in Germany.

### **3.3.2 Negative consequences of family-friendly arrangements**

Many women who return to work after having children do so on a part-time basis both in Great Britain and Germany. Working part-time can be a strategy to combine work with bringing up children, but chances for promotion and job prospects are generally lower for part-time employees. Stone and Lovejoy (2004) provide some indication of

this from a qualitative study. Lundgren and Barnett (2000) provide accounts of physicians encountering difficulties staying in their field of specialization if they work on a part-time basis. As mentioned above, Waldfogel (1997), Budig and England (2001), Joshi (1990), and Joshi, Paci, and Waldfogel (1999) show that large parts of the wage penalty for motherhood is accounted for by phases of part-time employment.

While it seems that women in higher-qualified occupations have better access to family-friendly employment schemes, there is some evidence that they are more likely to suffer from feeling that they are unable to demonstrate a necessary degree of commitment to their occupations if they reduce hours, or use flexible work schedules. Besides actual losses of career opportunities, cutting back on work time can have psychological consequences as well, because of perceived failure to meet role expectations connected to ones occupation. Barnett et al. (2004) compare female nurses and physicians, working full-time and reduced-hours schedules. They develop a measure of what they call ‘psychological contract violation’, which indicates the degree to which respondents feel their employers are not fulfilling implicit contracts by duly rewarding them for effort and dedication in terms of income, benefits, respect, authority, and job security. The authors argue that physicians working reduced hours will be more likely to feel marginalized or stigmatized than nurses working part-time. Reduced hours schemes are much more common among nurses than among physicians. Physicians working reduced hours may fear that their employers do not perceive them as being serious about their careers. They are expected to see medicine as a calling, rather than a job, while this is not the case for nurses. The authors cite studies that have found that reduced hours professionals often feel exploited and marginalized, that they face greater difficulties getting promoted, that they are perceived not to be as serious about their careers, and that income is not proportional to work load<sup>6</sup>. Unfortunately, the authors do not directly test the effect of work schedules on their measure of psychological contract violation. Instead, they test the effect of psychological contract violations on the intention to leave one’s job. They find that, under conditions of psychological contract violation, physicians are more likely to express intent to leave their jobs than nurses. They find that respondents working reduced hours who experi-

---

<sup>6</sup> The studies they cite are: Barnett and Lundgren (1998); Women’s Bar Association of Massachusetts Employment Issues Committee (2000); Levinson, Kaufman, and Bickel (1993); Fein and Garfield (1991); Fritz and Lantos (1991)

ence psychological contract violations are more likely to intend to give up their jobs than those working full-time.

Carr (2002) compares psychological consequences of work-family tradeoffs for men and women in three different cohorts (1931-1944; 1944-1959; and 1960-1970) in the United States (the results for men were already briefly mentioned earlier). Because socialization with respect to role expectations was different for respondents belonging to these different cohorts, the author expects the psychological consequence of work-family tradeoffs to diverge as well. The precise psychological consequences measured for this study are perceptions of work opportunities, as well as self-acceptance. The influence of work-family tradeoffs, operationalized as stopping work, cutting back on hours, or switching to a different job, on these two measures of psychological consequences are tested, while accounting for further control variables. The author finds a negative effect of work-family tradeoffs on the perception of work opportunities for the middle cohort of women and the youngest cohort of men, independent of actual measures of occupational standing. When self-acceptance is used as the dependent variable, the author finds a positive effect of stopping work for the oldest cohort of women, while stopping work has a negative effect on self-acceptance for the two younger cohorts of women. Making any type of work-family trade-off has a negative effect on levels of self-acceptance for the oldest cohort of men, no effect for the middle cohort, and a positive effect on self-acceptance for the youngest cohort of men. The author attributes these changes in the relationship between self-acceptance and work-family trade-offs across cohorts to changing role expectations. While education, employment status, income, and work experience (and in other models, further work characteristics) were controlled for, there is no test for interaction effects between these characteristics and work-family trade-offs on levels of self-acceptance. None-the-less, the author provides evidence that the effect of work-family trade-offs on levels of self-acceptance varies with role expectations. I would assume that it is likely that role expectations not only differ across cohorts, but also between occupations.

Carr (2002) also runs a model for determinants of the main independent variable, work-family trade-offs, to gain insight into the question of whether endogeneity may be a problem for the model with perception of occupational opportunities as the dependent variable. The suspicion is that those with low occupational prospects to begin with could be most likely to make work-family trade-offs. However, she finds that

those with the highest levels of education are most likely to make work-family trade-offs, presumably because they have more resources, or can rely on a spouse with higher earnings. This is in contrast to the findings reported by Joshi (2002) for Britain that women with higher levels of education take shorter times of leave from the labor market.

The greatest amount of flexibility from the employees' perspective is probably found in higher qualified occupations where there is more discretion over work hours and a high degree of work autonomy. However, in occupations in which very high levels of commitment are expected, and long work hours are common, women may be reluctant to notably reduce their work-time upon having children. Jacobs and Winslow (2004) report findings based on a large national sample of post-secondary faculty in the United States. Full-time female assistant professors on average work 56 hours a week when they are single and without children at home, 54 hours if they are married, 53 hours if they are married with children, and 51 hours if they are single with children. Hours for men are in the same range, but the effects are in the opposite direction (from 53 hours for childless singles to 56 hours for those who are married with children, but single men with children also work less, 52 hours a week). Thus both men and women work long hours, even if they have children. Referring to previous research (Mason and Goulden 2004) indicating that mothers have lower chances of attaining tenure, the authors conclude that this may not primarily be due to productivity differences. Even single mothers with children work very long hours.<sup>7</sup>

To summarize, women working in occupations requiring high levels of qualification may have greater work autonomy and better access to arrangements allowing them to combine work and parenthood. These arrangements can serve to protect them from exiting the labor market completely. On the other hand, working part-time or taking long times of leave can entail opportunity costs as well. Therefore, despite the better availability of family-friendly arrangements, women in professional occupations may still be more reluctant to have a first child.

The next section will discuss actual findings of effects of occupation and work characteristics on fertility.

---

<sup>7</sup> A slight draw-back of this study is that it does not differentiate by the age of the children. It is possible that parents cut back on work hours for a short time-period after the birth of children. The analysis also is only for full-time staff. It appears that over 90% of staff are working full-time, but it is not clear to what extent part-time work is linked to having children.

### 3.3.3 Effects of occupation on fertility

Ekert-Jaffé et al. (2002), studying cohorts born in the 1950s up until their early forties, find differences in parity progression ratios to first birth by occupation for Britain, but not for France. Women working in traditionally female professions, such as nursing or teaching, have higher parity progression ratios than managers. Blue-collar as well as sales workers have the highest parity progression ratios, followed by office workers. To track changes over time, they compare their findings for these cohorts with findings for cohorts born in the 1960s. For the younger cohorts, data is available only until they have reached their early thirties, so the comparison is limited to this age-span. The difference in the percentage of childless women in their early thirties in Britain increases between managers on the one hand, and blue-collar and economically inactive women on the other. Managers are more likely to be childless in the younger than in the older cohort at this age, while the proportion of childless blue-collar workers and economically inactive women decreases. The rate of childlessness among teachers also increases between cohorts. The authors also find that the importance of the partner's occupation has increased across time. While the partner's occupation had no significant effect on transitions to the first child in the older cohort, in the younger cohort, women whose partners are self-employed or who are blue-collar workers have the highest annual probabilities of having a first child. The authors attribute both developments, the increase in the level of childlessness among female managers and teachers, as well as the growth in the importance of the partner's characteristics, to growing economic insecurity in Britain.

Blossfeld and Huinink (1991) find a negative effect of career resources on first birth risks for Germany, while educational attainment, most likely due to a time-squeeze resulting from longer times in education, has a net positive effect on first birth risks. In a simulation, the authors show that if women with higher levels of education were continuously not employed, they would reach lower levels of childlessness than their less educated counterparts. Blossfeld and Huinink (1991) measure career resources by an indicator variable that incorporates both occupational prestige as well as work experience. Thus it cannot directly compare first birth risks between occupations.

As described earlier, a key variable in studying fertility transitions has often been educational attainment. The level of education is taken to be an indicator of human capital investments and labor market opportunities. Edwards (2002) argues that fertility outcomes vary by occupation even within the same educational group in the United States. Edwards (2002) finds no direct effect of educational attainment on duration to first birth after completing education. However, he does find an effect of occupation on this measure of first birth timing. In 1987, those employed in professional, technical, and managerial occupations became mothers later than nurses, teachers, sales workers, clerical workers, service workers, and operatives. This changed by 1996, when fertility delays for clerical workers and operatives were almost as large as for those working in professional, technical, and managerial occupations.<sup>8</sup>

Hoem, Neyer, and Andersson (2005) study ultimate levels of childlessness by specific educational qualification for women in Sweden born in 1955-59. Because they use register data, they are able to analyze differences in childlessness between women in almost 60 educational categories. They argue that not only the level, but also the educational field can be expected to be important for fertility decisions. The authors reason that women in female-dominated fields of education may perceive more support for combining a career and motherhood. As indicated by the authors, it is also sometimes held that women in these fields are socialized more strongly towards the role of motherhood, that gender stereotypes are more preeminent in fields of education where women are in the majority. Different educational qualifications also lead to labor market experiences and occupations that diverge in the implications they are likely to have for decisions to have children. Most female-dominated educational fields also lead to female-dominated occupations. Some qualifications are more

---

<sup>8</sup> One problem with the analysis by Edwards (2002) is that it includes only those who eventually became mothers. This would usually be seen as a form of anticipatory analysis. The author justifies this mode of analysis by arguing that women who do not eventually become mothers are outliers. The very long birth interval applying to childless women from the end of education to age 45, for example, would lead to an inflated average first birth interval, according to the author. But of course, as the author also admits, excluding childless women can lead to an underestimation of negative effects on the decision to have a first child. A different solution might have been to use a duration dependent event history model. That way, low risks of first birth at higher ages would not have distorted measures of first birth risks at younger ages.

A main finding by Edwards (2002) is also that delays in first birth have increased for all occupational groups across time. This explains a greater proportion of the general increase in average age at first birth than do changes in the occupational structure. Also, the author finds that the effect of educational attainment on age at first birth operates mainly through an increase in the amount of years spent childless in education.

likely to lead to work in the public sector, others to work in the private sector. Some match specific occupations in a clear-cut manner, others do not prepare students for any one type of occupation in particular. Further, some types of educational qualifications lead to occupations where rates of skill depreciation during absence are higher than in others. The authors find that women with degrees in health or teaching generally have relatively low levels of childlessness. These are fields in which female students are strongly overrepresented. Fields in which women are only slightly overrepresented or comprise about half of the students, like the humanities or law, are much more diverse with respect to childlessness. Health and teaching, where the level of childlessness is low, are also generally public sector occupations. However, the authors find that women with other degrees typically associated with public sector employment, for instance women qualified to be librarians, have much higher levels of childlessness. Degrees leading to female-dominated occupations in the private sector have no uniform association with level of childlessness. Especially degrees leading to occupations with long or non-standard working hours, like in the hotel business, are associated with high levels of childlessness. Women with degrees that do not precisely match any specific type of occupation also have higher levels of childlessness, as do those where the rewards in terms of occupational outcomes are very diverse. Women in male-dominated fields have relatively low levels of childlessness, in contrast to what one might expect.

Kurz, Steinhage, and Golsch (2005) test the effect of occupational class, as measured by the Erikson-Goldthorpe scale, on first birth risks in Germany. They find that female un- and semi-skilled manual workers as well as women employed in the higher service class (the highest class in this scale) have the highest first birth risks, while those in the routine non-manual class, and those in the lower service class have significantly lower first birth risks. Thus, there does not seem to be a linear relationship between class position and first birth risks; those in the highest and lowest class seem to have relatively high first birth risks. Since the authors do not control for education in their model including occupational class, the high first birth risks for the higher service class could reflect a time squeeze for those who have spent a large amount of time in university education. Another explanation could be that, since the higher service class includes professionals, this group is likely to contain a high proportion of teachers. At least for Britain, the United States, and Sweden, the studies

described above have shown that working as a teacher appears to have a positive effect on transitions to first birth.

For Great Britain, Francesconi and Golsch (2005) also find that women working as professionals as well as those working in manual occupations have the highest odds of transition to first birth. However, in contrast to Germany, the odds are lower for un- and semi-skilled workers (although here it is not clear whether this group also includes non-manual workers). The high odds of first birth for professionals in this model are unlikely to be due to a time-squeeze, since level of education is accounted for. In this model, there is a differentiation between professionals and managers, and managers are found to have lower odds of transition to first birth than professionals. Again, I would assume that professionals may be working in more female-dominated occupations than managers.

### **3.3.4 Selectivity into family-friendly jobs**

Becker (1985), Polachek (1981), and Mincer and Ofek (1982) have argued that gender segregation of the labor market can be explained by women's tendency to select jobs with lower rates of wage depreciation during intermittency, thereby maximizing lifetime earnings, as well as women's tendency to select less strenuous, more flexible jobs that are more compatible with childcare. England (1984) tests and finds evidence against the hypotheses that life-time earnings are higher for those who are intermittently employed in female-dominated occupations than for those who are intermittently employed in male-dominated occupations. Glass and Camarigg (1992) find evidence against the second hypothesis, that women with children predominantly choose flexible and easy jobs. On the contrary, they find that women with children tend to have less flexible and easy jobs than others in the labor market. Glass and Camarigg (1992) suggest that there may be little tolerance for mothers of small children in 'good' jobs that offer higher degrees of flexibility and better working conditions. Budig and England (2001) find that the wage penalty for motherhood is unrelated to many job characteristics, such as degree of cognitive skills or on-the-job or vocational training required. They even find that the wage penalty is lower for women in predominantly male occupations. As mentioned earlier, Waldfogel (1997), though, finds a higher wage penalty for women with higher levels of education.

To summarize, these studies suggest that choosing female dominated occupations does not necessarily reduce the opportunity costs of having children. Given this finding, there would then at first glance not be much reason to believe that women with strong preferences in favor of having children are overrepresented in predominantly female occupations. One would have more reason to expect the contrary. However, social approval of having children may still be higher in female dominated occupations, even if opportunity costs are also higher. This could be a relatively strong incentive to choose these types of occupations. In addition, people may not be fully aware of actual differences in opportunity costs in different types of occupations at the time they decide which type of vocational training they will pursue.

### **3.4 Education, work and fertility timing**

The previous sections dealt with the influence of income, education, and work characteristics on the general tendency to have children, without accounting for the timing of the decision to have a child. The point in time in terms of age, work experience, or duration since leaving education may however also impact decisions to have a child. The effect of time by these measures may again depend on the level of educational attainment and occupation.

#### **3.4.1 Education and fertility timing**

One factor that strongly influences the timing of cohabitation, marriage, and child-bearing is the number of years spent in education. Hoem (1986) distinguishes between the effects of educational participation and educational attainment in a study of transitions to marriage and cohabitation in Sweden. He finds no significant effect of educational level on union formation, but does find significant negative effects of being a student on both marital and cohabitational union formation for birth cohorts 1936-1960 for Sweden. Effects were estimated separately by age group and five-year cohort group. The only exception to the pattern was a positive effect of being a student on transitions to cohabitation for the oldest age group, age 24. At this age, students were generally finishing their studies.

It seems that being a student has a similar negative effect on first birth as it has on cohabitational or marital union formation and is likewise a more important factor than educational attainment. Studies for many different countries have shown that women generally postpone childbearing until after they have completed their education. Rindfuss, Morgan, and Swicegood (1988) show for the United States in a study based on data for a cohort of students who were in their last year of high school in 1972, that in the subsequent years, those who attended college or vocational training had the lowest probability of becoming a parent. Women who were homemakers had the highest probability of having a child, followed by those working part-time and those working full-time. The type of post-secondary education that was being attended also had an effect on the probability of becoming a parent. Those attending four-year colleges had the lowest probability of having a child, followed by those in junior colleges and finally by students of vocational schools.

Blossfeld and Huinink (1991) show for West Germany that participation in education has a very strong negative effect on risk of first birth. Independent of the level of education attained, first birth risks rise after the completion of education. Models including variables for student status as well as educational attainment in more recent studies have also provided evidence of a negative effect of student status, for example in Kreyenfeld (2001), Vikat (2004), and Edwards (2002).

The reason women postpone childbearing until after completing education may be that they perceive a need to achieve economic independence from their parents before having a family of their own, that they are avoiding a potential time conflict between child care and educational participation, or that they are adhering to normative expectations according to which students should not become mothers (Blossfeld and Huinink 1991).

Because of large differences in age when completing education, the tendency to postpone childbearing until having left school is likely to result in distinctly different age patterns for first birth risks by level of education. First of all, women with lower levels of education are on average younger at first birth than their higher educated counterparts, since they start childbearing while the latter are still attending education. For example, Kreyenfeld (2001) finds large differences in median age at first birth by ultimate level of educational attainment for West Germany, and somewhat smaller differences for East Germany.

One would also expect first birth risks to be steadier across longer age spans for those with lower levels of educational attainment. Because women with low levels of education are younger when they finish education, they have a long time span ahead of them during which they can choose to have a first child. For those with higher levels of educational attainment, the pattern of first birth risks across age is likely to be more compressed. Women with high levels of education are quite a number of years older when they receive their degrees. Because they are aware of the shorter amount of time they have left until they reach the biological, or socially sanctioned, limits of fertility, they speed up their childbearing during a short age span. As described earlier in the section on the effects of educational attainment on fertility, there are no uniform findings of negative effects of level of education on first birth risks, in contrast to what one would expect following hypotheses based on opportunity cost considerations. An explanation could be a time-squeeze effect, as outlined here.

### **3.4.2 Life-time earnings and optimal age at first birth**

Economic theories of fertility timing generally attempt to determine the age or union duration at birth at which either life-time earnings or utility are maximal. Hotz, Klerman, and Willis (1997) incorporated the different elements of various economic approaches to fertility timing in a general set of formulas. These general formulas can be used to compare and classify different versions of the problem of determining the optimal timing of fertility.<sup>9</sup>

Specifications of the utility to be optimized by means of birth timing usually involve one or more of three different sources of utility: utility gained by having children, utility provided by leisure time, and utility derived from consumption. Parents' utility from these sources at each time point in their lives is summed up to obtain life-time utility. The optimization problem then is to maximize life-time utility as a function of birth timing. Some models also include costs of contraception, which lower

---

<sup>9</sup> The formulas developed by Hotz, Klerman, and Willis synthesize models proposed by Heckman and Willis (1976); Razin (1980); Hotz (1980); Cigno (1983); Happel et al. (1984); Moffit (1984); Vijverberg (1984); Hotz and Miller (1986); David and Mroz (1986); Newman (1988), Cigno and Ermisch (1989); Montgomery (1989); Cigno (1991); Hotz and Miller (1993); Rosenzweig and Wolpin (1993); Walker (1995).

utility and thereby also affect birth timing. There are also models that allow for the stochastic nature of fertility (Hotz, Klerman, and Willis 1997).

Utility gained from having children, in turn, depends on the timing of births, the mother's time input, as well as market inputs invested in children. The mother's time, however, is limited within any period and has to be divided between caring for children, leisure time, and time spent in the labor market. Most models assume that mothers, but not fathers, spend a sufficient amount of time caring for children for this to compete with time in the labor market and leisure time (Hotz, Klerman, and Willis 1997).

The parents' budget constraint is given by the father's income, the mother's income, expenditures for consumption, expenditures on children, expenditures for contraception, and basic costs of children. The budget constraint also depends on whether saving and borrowing is allowed or not. According to the authors, all models in the existing literature either assume that *perfect capital markets* or *perfectly imperfect capital markets* exist. That is, either both unlimited saving and borrowing, at given interest rates, is allowed, or there is absolutely no possibility to borrow or save. The authors hold that it would be more realistic to assume *less than perfect capital markets*, which would incorporate possibilities for saving, but not borrowing. This, however, would complicate models even further. A few life-cycle models also account for uncertainty with respect to future labor market outcomes by modeling future incomes as stochastic variables (Hotz, Klerman, and Willis 1997).

The mother's wages, finally, depend on her past wages, current work effort, age-related skill depreciation, and skill depreciation due to time outside the labor market (Hotz, Klerman, and Willis, 1997).

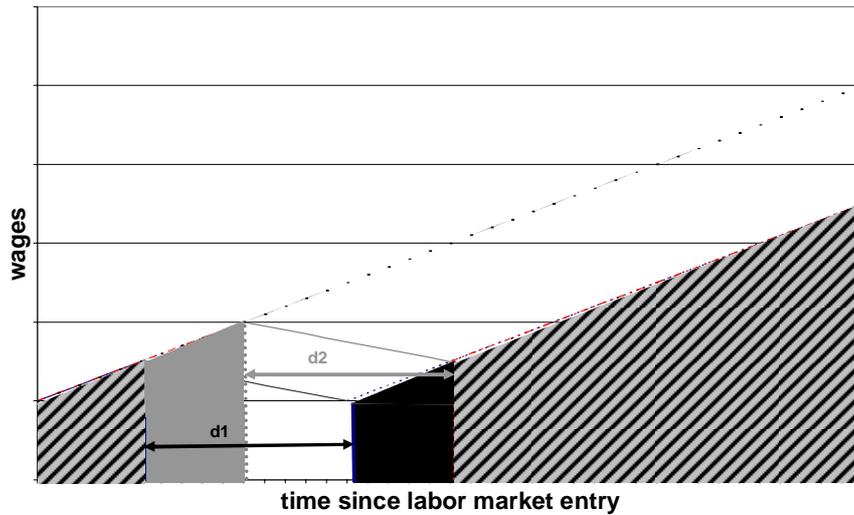
According to the authors, solutions to the problem of optimizing the parents' life-time utility by means of birth timing, given the constraints named above, take the form of very complex functions of future prices and incomes. Unambiguous predictions are usually difficult to obtain. However, some predictions about the effects of some of the elements of the models on certain aspects of life-cycle fertility are usually possible. One such element of life-cycle fertility is the timing of first births (Hotz, Klerman, and Willis, 1997).

Solutions for the optimal age at first birth, according to Hotz, Klerman, and Willis (1997), primarily depend on what assumptions one makes about the utility par-

ents gain from having children, assumptions about possibilities to save and borrow money, and how the value of the mother's time is taken to vary over her life course.

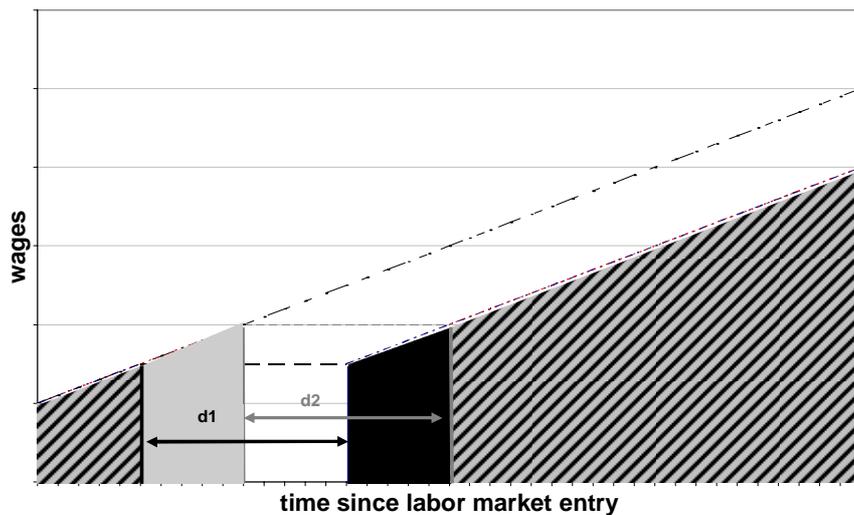
It appears that the value of the mother's time only varies across the life course in those economic models of fertility timing in which human capital is taken to depreciate during times of absence from the labor market. Allowing for human capital depreciation, life-time earnings are highest for women who postpone first birth the longest, among those who have some initial human capital at the beginning of the fertility planning period, e.g. the beginning of a union. Among those who have no initial human capital, life-time earnings are highest when the first child is born at the beginning of the planning period (Hotz, Klerman, and Willis, 1997). Figure 3.1 illustrates the benefit of postponing first birth given skill depreciation. For figure 3.1, I assumed a very simple model of linear skill appreciation and depreciation. Human capital, translated into wages, was set to be high enough at the beginning of the planning period to not depreciate completely during times of absence. Figure 3.1 shows two different possibilities for the timing of absence from the labor market. The first person is absent from the labor market for duration  $d_1$ . The second person is absent from the labor market for duration  $d_2$ , which is the same length as  $d_1$ , but later in that person's career. The area shaded black represents earnings by person 1, and the area shaded gray represents earnings by person 2. The striped area represents earnings by both person 1 and 2. As one can see, the extra earnings (gray) by person 2 who leaves the labor market later are greater than the extra earnings (black) by person 1 who leaves the labor market earlier. Formulas for this relatively simple example are given in the appendix.

Figure 3.1: Effect of timing of first birth on life-time earnings given skill depreciation



If it is assumed that human capital does not depreciate with time outside the labor market, timing of first birth is generally predicted to have no effect on a woman's life-time earnings (Hotz, Klerman, and Willis, 1997). Figure 3.2 illustrates the case where there is no skill depreciation during times of absence. As one can see, here, in contrast to figure 3.1, there is no earnings advantage for a later timing of absence from the labor market.

Figure 3.2: Effect of timing of first birth on life-time earnings without skill depreciation

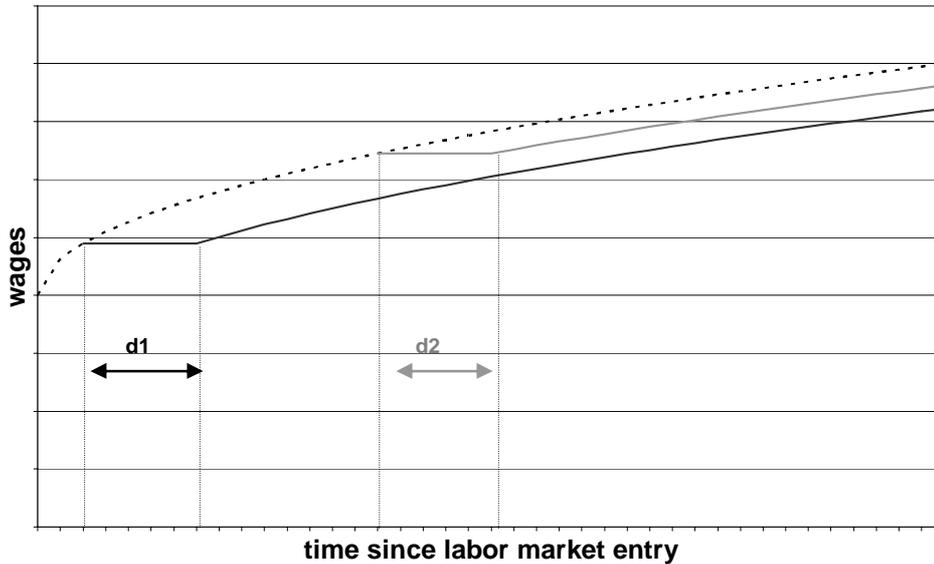


Under the assumption of *perfect capital markets*, the graduation of the father's earnings has no effect on the optimal timing of first births. However, under the assumption of *perfectly imperfect capital markets*, it would be better to have children when the father's earnings are highest, because then, the marginal utility of the father's income for consumption is lowest. Parents would lose less utility through a given amount of expenditures on children. Though there are no models in the literature that assume *less than perfect capital markets*, where parents can save but not borrow, the authors speculate that in this case as well, parents would postpone first birth until they have saved a certain amount (Hotz, Klerman, and Willis, 1997).

If utility derived from children is modeled in a simple fashion, that is if utility is taken to be proportional to the total number of children one has in one's lifetime, timing of childbearing will have no effect on utility derived from children. If however total utility provided by children is modeled as the sum of period-by-period utility, and children are seen to provide utility only after they are born, parents would derive more life-time utility from children if children are born earlier. This would be a factor leading to earlier births (Hotz, Klerman, and Willis, 1997).

As Hotz, Klerman, and Willis (1997) have shown, and judging from the reconstruction of a simple model of the effect of the timing of employment interruptions on lifetime earnings, the general conclusion seems to be that the rate of depreciation is the most important factor determining the importance of fertility timing for life-time earnings. If there is no depreciation, fertility timing is irrelevant. Of course, if there is no employment interruption, fertility timing is irrelevant as well. As shown in the appendix, the effect of fertility timing also depends on the length of employment interruptions; the longer the employment interruption, the more important the timing of this interruption. However, in these models, the assumption has been that the rate of skill appreciation is constant. Gustafsson (2001) proposes a different model of skill appreciation across the life-course, where at first wages increase strongly with age, but then continue to rise ever more slowly as people grow older. Given this type of an assumption about the nature of skill appreciation by age, timing becomes relevant even if there is no skill depreciation during times of absence from the labor market. Income losses are then smaller for late than early births, and the more so the greater the change in skill appreciation by age. This is illustrated in figure 3.3. While the immediate wage loss is greater for later births, the long-term effect for future earnings decreases disproportionately for later births.

**Figure 3.3: Effect of timing of first birth on life-time earnings with declining wage growth**



The age dependency of rate of wage growth proposed by Gustafsson (2001) does seem plausible, if one assumes that most promotions take place nearer to the beginning of peoples' careers. Also, as Gustafsson (2001) points out, employers tend to recruit younger employees for positions that require large amounts of training. One problem with this model might be, though, that wage growth may not be quite as strictly age-dependent as proposed by Gustafsson (2001). In Gustafsson's (2001) model, wage growth at labor market reentry is given by one's age (or time since initial labor market entry). However, one might assume that a person reentering the labor market has a different rate of wage growth at this time point than someone who had been employed all the time. At least partly, wage growth may also depend on employment experience and tenure as well.

To summarize, if one either assumes that skills depreciate with time outside the labor market or that earnings profiles are steeper at younger ages, or both, then the conclusion for the effect of birth timing is that losses to life-time earnings are smaller the older the mother is at first birth. The effect of timing increases with rate of depreciation, with length of time outside the labor market, as well as with the rate of change of human capital appreciation in models where it is taken to vary. Therefore, one would expect women in occupations where skills depreciate more strongly to post-

pone births the furthest. Also, whenever times of absence from the labor market are expected to be longer, the incentive for postponement of births would be stronger. Since leave times are on average longer in western Germany than in Great Britain, this might lead to later births in western Germany as compared to Great Britain.

If the mother has practically no human capital at the beginning of the birth planning period, postponing births would only make sense in the scenario proposed by Gustafsson (2001). If one allows for human capital depreciation, very low levels of human capital let early births maximize life-time earnings, as pointed out by Hotz, Klerman, and Willis (1997).

### **3.4.3 Tenure, employment security and first birth**

Rates of skill appreciation and depreciation may not be the only reasons for a link between birth timing and employment outcomes. Qualitative studies have shown that women often postpone births until they have achieved some form of employment security, such as a long-term contract or an entitlement to maternity leave. Ranson (1998) analyses data from a longitudinal study of 185 Canadian women who graduated from the University of Alberta in 1985. They were last interviewed in 1992, when their average age was 30. At that time, only 31% had children. The achievement of job security was regularly named by interviewees who had already become mothers by the time of the interview as an important consideration that had influenced their decision when to start having children. One respondent had decided to work for at least two years before having a first child, because that was the amount of time it took to achieve professional status in her occupation. Another mentioned that she and her husband both had jobs, and having a child seemed like the next step. A further respondent said that she had wanted to become a manager before having a child, because she was entitled to reinstatement in the same kind of job. She felt that her chances of becoming a manager would have been lower if she had had a child first. The teachers in the sample tended to wait to have children until after having received a permanent contract. With a permanent contract, they were entitled to a two year maternity leave.

Some of the respondents who had not yet had children by the age of 30 reported that they had postponed becoming mothers in part because of difficulties estab-

lishing their careers. Some had changed occupations, and were therefore several years behind in gaining work experience. Teachers who had not been able to achieve tenure were also postponing having a first child (Ranson 1998).

However, work experience did not make the decision to have children easier for women in all types of occupations. Some women had gained a large amount of work experience, but had the feeling that in their type of occupation or workplace, having children would be extremely difficult to manage at any stage of their career. This was either because of regular overtime, or because of an unsupportive work environment with few female colleagues who already had children to serve as role models (Ranson 1998).

The study by Ranson (1998) seems to show that work experience was an important prerequisite for decisions to have children especially in occupations that were female dominated or relatively supportive of working mothers. In other occupations, combining work and motherhood appeared almost unfeasible at any time.

The results from this qualitative study indicate that it may not only be rates of skill appreciation or depreciation that determine the optimal timing of births. The assumption that skill levels translate directly into job options seems to have its roots in neoclassical economic theory. Under the assumption, however, that there are institutionalized structures to the labor market that modify the translation of skills into job options, the development of skills might not be the most important determinant of the relationship between birth timing and life-time earnings. The ability to retain one's job after having a child may have little to do with ones level of skills, and more with legislation, firm policies, or customary practices.

#### **3.4.4 Empirical research on the effect of timing of childbearing on wages**

The economic models described above give reason to expect an effect of the timing of childbearing on life-time earnings. The qualitative study by Ranson (1998) gives some indications that not only life-time earnings, but also present job status and earnings are affected by fertility timing. If postponing childbearing increases chances of promotion, this can affect earnings at a given age. The empirical studies summarized below analyze the effect of fertility timing on wages.

Blackburn, Bloom, and Neumark (1993) look at the effect of fertility timing on wages in the United States and find that women who have their first child later earn higher wages. They find that this is largely due to differences in education, experience and tenure. The authors had hypothesized that – and developed a model according to which - women who invest more into their human capital development and therefore expect higher returns to education, job experience, and tenure, delay their childbearing. However they did not find empirical evidence that late childbearers actually received higher returns to their education, experience, and tenure. Late childbearers did not profit more per unit of human capital, but they possessed more human capital which led to higher wages. The direction of causality between accumulation of human capital and timing of childbearing remains unclear here, especially because the authors do not distinguish between human capital accumulated before and after birth.

In a study of women born between 1944 and 1954 in the United States, Taniguchi (1999) finds that women aged 20-27 at first birth experience a wage penalty compared to childless women even when controlling for work experience, education, and demographic variables. With these control variables, women older than 28 at first birth however experience no significant wage penalty. Before controlling for unobserved heterogeneity, work experience after birth had a stronger effect on wages than work experience before birth; this was reversed when controlling for unobserved heterogeneity.

In the simulation by Joshi (1990), described earlier, of women's forgone earnings due to motherhood based on an analysis of a 1980 cross-section of British women, the effect of timing of childbearing on the wage penalty for motherhood is also tested, and found to be very small.

Thus the empirical evidence for an effect of fertility timing on wages is mixed. Especially, it does not seem that there are many studies focusing specifically on this question. The finding by Taniguchi (1999) that work experience before birth is important for the level of wages may support the idea that establishing employment security by greater work experience is important for mother's employment outcomes.

### **3.4.5 Empirical research on the effect of labor market experience on the timing of childbearing**

If women have reason to believe that the timing of childbearing affects their future wages or employment prospects, this may influence their decisions about when to have a first child. Various studies have found an effect of work experience or time since leaving education on the transitions to first birth. For example, Kravdal (1994) finds that first birth risks increase during the first 4 years of work experience in Norway. Vikat (2004) finds for Finland that first birth risks rise with the amount of time spent in employment or unemployment (as opposed to non-employment) during the last year.

Some studies have also examined whether the effect of time since leaving education varies with educational attainment. Kreyenfeld (2004) compares women with different levels of education in East and West Germany before unification. She finds that in East Germany, first birth risks are highest just after exiting the education system for all levels of educational attainment and decrease thereafter. By contrast, in West Germany, first birth risks are lowest just after leaving the education system and increase during 2-6 years after leaving education. The dependence of first birth risks on time since leaving education differs more by educational level in West than in East Germany, with lower risks at the beginning and stronger increases later on for higher levels of educational attainment. Kantorová (2004) finds for the Czech Republic that in the period between 1979 and 1989, first birth risks increased very strongly immediately after the end of education, especially for those with the highest level of educational attainment. By contrast, in the period between 1990 and 1997, first birth risks increased much more slowly after the end of education, particularly among those with the highest level of education.

Some analyses have also looked into differences in fertility timing between occupations. Happel, Hill, and Low (1984), for example, found for American women born between 1944 and 1954 that those in high-skilled occupations postponed first births longer than those in low-skilled occupations. Cigno and Ermisch (1989), using a survey of British women aged 16-59 in 1980, compare fertility rates of women with different amounts of work experience before marriage, different levels of education, and different occupations, while not differentiating by birth order. They find that women with more work experience before marriage have lower overall fertility rates.

They also find that women in clerical occupations have children later in marriage than women in semi-skilled manual occupations, and take this to support the hypothesis that women in clerical occupations can expect higher returns to experience and thus delay childbearing. Interestingly, they also find that women with higher levels of education have higher birth rates. However, the authors argue that this may be due to misspecification of their model, which may not include enough of the husband's characteristics.

In many of the countries named above, then, first birth risks increase with time in the labor market. This was found to be the case in Norway, Finland, West Germany, and in the Czech Republic after 1989. Only in East Germany and the Czech Republic before 1990 are first birth risks highest right after ending education. Perhaps this was because job security was so high and childcare was so well provided for that women did not have to fear negative impacts of early childbearing on their labor market prospects (Kantorová 2004; Kreyenfeld 2004). For Great Britain, Cigno and Ermisch (1989) also found a negative effect of work experience on birth rates. However, they only measured work experience before marriage and did not differentiate by birth order. The effect of time in the labor market on first birth risks was found to differ by level of educational attainment in the Czech Republic after 1989 and in West Germany. Occupation was found to have an effect on fertility timing in Great Britain and the United States.

### **3.5 Conclusion**

In this chapter, the extensive discussion on the impact of men's earnings on fertility was reviewed. Very early theories purported a straightforward positive effect of men's earnings on fertility, as in Becker (1960). As already indicated in Leibenstein (1957) though, there is the possibility that costs of children rise with income as well. This is also underlined by Duesenberry (1960) and Okun (1960). As pointed out in Leibenstein (1974) however, this is only relevant for fertility outcomes if rises in costs of children are stronger than rises in income. A further point that has been made is that consumption patterns can vary with income as well. If high income families also have a high demand for consumer goods, they will have less income left to spend on children (Leibenstein 1974). If socialization with respect to consumption depends on ones

parents level of income, there may not be a straightforward relationship between own income and the feeling that one is able to support a family (Easterlin 1987).

Early empirical studies that have found support for a positive effect of men's income on fertility are those by Mincer (1963) and Cain and Weininger (1973). More recently, Huinink (1995a) has found a positive effect of men's income on first birth risks for Germany. Kreyenfeld (2005) also found a positive, but insignificant effect of men's income on fertility in Germany. Bernhardt (1972) tests the effect of men's income separately by occupational group to account for differences in child expenditure standards. However, while she found a general positive effect of men's income on first births, not much evidence was found for positive income effects within occupational groups, with the exception of manual workers. Easterlin (1987), on the other hand, does find support for his theory of the importance of relative income for fertility, using macro-level time series data.

The hypothesis I would like to test is that there is a general positive effect of men's income on first birth risks in western Germany and Great Britain. I think that a positive effect is probable, because rises in costs of children would have to be very large to override positive income effects. Basic costs of children are quite high in industrialized societies. These include the cost for larger apartments, as well as the costs for food and clothes. Especially though, in Great Britain and western Germany, one parent, usually the mother, tends to interrupt or reduce employment for an extended period of time. Therefore, the father's income has to be high enough to support an additional adult as well. While these basic costs are substantial, it does not seem very likely that additional costs for higher income groups, such as for more expensive clothes or toys, can have a very large impact. Children of parents with higher levels of income may be more likely to attend education up to higher ages. However, it is not usually possible to borrow large amounts of money against future income to pay for basic costs of supporting children. Therefore, it is not very likely that the time span across which one plans to support ones children is of that much importance for the affordability of children. If one can afford the costs for a short time span, it is likely that one can also afford the costs across a long time span. A special case may be the costs of university education. These may imply a strong rise in costs at a later time point. However, most people cannot foresee the development of their income so many years in advance. The affordability of university education and possibilities for financing it may be considered at a later time point. Altogether, even if there are higher

costs for higher income groups, the difference in costs would have to be larger than the difference in income to produce a negative effect on fertility. It is not clear why this should be the case.

The research summarized in this chapter on men's work-family compromises seems to show that while some attitudinal changes may be taking place, actual reductions of working hours by fathers are rare. Even where they occur, perhaps because fathers are less likely to suffer from stigmatization than mothers, small reductions in working hours have not been found to result in poorer career outcomes. Therefore, opportunity costs are unlikely to play a part in men's decisions to have a first child.

Though it is often referred to and has been very influential for empirical studies, there are not many explicit statements of the opportunity cost argument for the influence of women's income on fertility in the theoretical literature. One explicit statement is in Leibenstein (1957). Some early empirical studies test for negative effects of women's income (Mincer 1963, Cain and Weininger 1973), but without any extensive theoretical discussions of the opportunity cost argument. The opportunity cost argument is often attributed to Gary Becker. At least with respect to fertility, however, Becker never actually seems to claim this argument for himself, nor puts it into the center of his theoretical discussion of fertility. Becker's discussion of the economics of fertility, both in Becker 1960, and in Becker 1993, focuses on the relationship between men's income and fertility. He only sometimes (as in Becker (1993) and Becker (1965)) makes a short reference to previous empirical studies on the effect of women's income on fertility, especially to the studies by Butz and Ward (1979) and by Mincer (1963).

In any case, the classical opportunity cost argument is usually taken to mean that the higher a women's present income, the more income she will forgo if she discontinues employment to take care of children. Therefore, the higher a women's income, the less likely she will be to decide to have a child. Recently, much empirical research has focused on establishing the actual levels and determinants of opportunity costs. Understanding actual patterns of opportunity costs may help to discern how women anticipate parenthood to affect their careers. Recent studies on Britain reviewed in this chapter have shown that wage penalties for motherhood are partly caused by higher rates of part-time employment as well as less work experience. Wage penalties for motherhood have been found to be lower in western Germany than in Britain. Presumably, this is because the hourly wage differential between the part-

time and full-time employed is not as great in western Germany as in Great Britain (see chapter 5). This does not however necessarily imply that life-time opportunity costs of childbearing are generally smaller in western Germany than in Great Britain. Mothers return to work more slowly in western Germany than in Great Britain, leading to income losses over longer times of absence. At least for 1980, very similar life-time opportunity costs for western Germany and Great Britain have been found (Joshi 2002). For Great Britain, there is some evidence of lower life-time opportunity costs for women with higher education. Findings of quicker returns to the labor market by mothers with higher as well as very low levels of education in Germany indicate that a simple positive association between level of education and opportunity costs may not apply to Germany either.

An explanation for these findings of lower opportunity costs for more highly educated women could however be that highly educated mothers are a select group. Because potential opportunity costs if they were to completely give up employment are so high, it is likely that only those become mothers who find some way to reconcile work and parenthood. This could explain why one at the same time finds low opportunity costs and low transition rates to motherhood for women with high levels of education.

Actual opportunity costs are also likely to depend on the degree of compatibility of work and childcare. Research for Great Britain has shown that women working in occupations requiring higher levels of qualification have better access to family-friendly arrangements such as part-time work or flexible working schedules. Also, firm size as well as public sector employment have been found to be positively associated with the provision of family-friendly arrangements. For Germany, less information is available on the association between these employment characteristics and family-friendly arrangements. Because statutory leave durations in Britain are shorter, one could assume that part-time or flexible arrangements provided by employers are more important for parents than in Germany. In Great Britain, supplementary maternity leave is sometimes voluntarily offered by employers. One might assume that in Britain, larger firms are better able to provide supplementary maternity leave as well, as they have already been shown to more often provide part-time and flexible employment for parents.

There has been some research for the United States suggesting that self-employment tends to be quite compatible with childrearing. However, the nature of

self-employment may vary strongly between countries. Also, while work autonomy may be high for the self-employed, work load can be higher as well. Taking leave is likely to be much more difficult for the self-employed, too. Moreover, forms of self-employment are very diverse, ranging from being an owner-manager of a large firm, to being a low paid service worker.

Making use of family-friendly arrangements, like part-time work, extended maternity leave, or flexible working hours, can have negative consequences too, though. Promotion opportunities tend to be lower for part-time employees. Particularly women in professional occupations may feel they are not living up to role expectations when they make use of family-friendly arrangements. Therefore, women in occupations that require higher levels of qualifications may be more reluctant to make use of family-friendly arrangements. I would therefore expect the greater availability of these arrangements to only have a limited influence on fertility decisions for women in professional and managerial occupations. However, if one already is working part-time, this may not be as much of a threat, since one does not have as much to lose. For instance, Budig and England (2001) find that the wage penalty for motherhood is higher for full-time than part-time workers in the United States.

The economic models of fertility timing imply that postponing first birth is almost always beneficial in terms of life-time earnings, at least for everyone who has at least some initial human capital. The importance of first birth timing for life-time earnings in models of linear skill appreciation and depreciation depends on the rate of depreciation and the duration of leave. Because childcare is more difficult for them to afford, women with lower levels of education and lower earnings may decide to take a longer amount of time out of the labor market. This however again increases the importance of timing: the longer the duration of leave, the more beneficial it is to postpone first birth. Women with higher levels of qualifications, on the other hand, are likely to have higher rates of skill depreciation during absence. This also leads to a greater importance of timing of first birth for life-time earnings. Thus, economic models of linear skill appreciation and depreciation do not seem to produce unambiguous predictions of the effect of level of qualification on the timing of first birth. The implication is that postponement of first birth is almost always beneficial, but it is not clear whether this is more or less so for those with lower or higher education. In the model proposed by Gustafsson (2001), the benefit of postponing birth depends on the degree to which the rate of skill appreciation slows with age. People with higher lev-

els of qualification are likely to experience stronger changes from high rates of skill appreciation at young ages to lower rates at older ages. Change in rate of skill appreciation by age is likely to be smaller for people with lower levels of qualification. Therefore, according to Gustafsson's (2001) model, those with higher levels of qualification will profit more from postponing first birth. Qualitative results by Ranson (1998) suggest that some women feel it is beneficial to wait until they have advanced somewhat in their career before deciding to have a first child. If early career advancements are more common for women with higher levels of qualification, they may more often postpone first birth.

## **Chapter 4**

### **Family Policy and Family-Related Institutions in the United Kingdom and Western Germany**

#### **4.1 Introduction**

The welfare state institution that is probably the most important in aiding to make employment and parenthood compatible is public childcare. The provision of childcare is however similarly poor in both Great Britain and western Germany. One of the greatest differences with respect to family policy between the two countries lies in the taxation of married couples. In Germany, by means of the system of income-splitting one-earner married couples are greatly benefited. The cost of income-splitting was estimated at 22 billion Euros for 2001 (Schratzestaller 2002). Since 1990, married people are taxed individually in Britain. Financial support for families generally seems to be made via the tax system in Germany. Tax deductions for children and for childcare tend to benefit higher income families somewhat more than lower income families. Financial aid for childcare is generally very low, though. In Britain, on the other hand, measures have recently been introduced to aid low income families in paying for childcare.

#### **4.2 Child benefit and tax deductions for children**

In Germany in the post-war period, there have been two main forms of financial support for families with children. One is tax deductions, the other is child benefit payments. Small tax deductions for children were introduced in 1950. They were sequentially increased until 1962. The intention behind tax deductions is to free parents from paying taxes for the amount of income necessary to provide a minimal standard of living for their children. However, because of the progressive tax system, in practice, tax deductions have led to higher savings for higher income groups. For that reason, tax deductions for children were abolished in 1975 by the social democratic-liberal government, but reinstated on a low level of DM 432 per child and year in 1983 by

the conservative-liberal government. They were strongly increased in 1985, followed by a number of additional increases until 1994, to a level of DM 4104 per child and year. In 1996, the government was forced to raise the deductible amount even further, to a level of DM 6264 due to a constitutional court ruling that the amount of income necessary to secure a minimum standard of living for children may not be taxed. It was observed that thus far the deductible amount was not yet equivalent to the minimum standard of living for children, even when accounting for the fact that child benefit payments could additionally be taken advantage of (BMFSFJ 2001).

Until 1996, parents could make use of both child benefit payments and tax deductions, although child benefits rates were often higher for low income groups. Afterwards, they had to choose between the two. This implies that child benefits are now coupled to the height of tax deductions and thus to minimum standards of living. This is because the amount necessary for a minimum standard of living must be deductible. For income groups who choose child benefit payments because they are still higher than the amount they would save through tax deductions, part of the child benefit payments can be seen as being equivalent to the amount they would save through tax deductions, i.e. to deducting the amount necessary for a minimum standard of living. The other part can be seen as a benefit on top of tax deductions. If there is to be any benefit on top of tax deductions for medium income families, then the height of the child benefit needs to be oriented on the height of tax deductions (BMFSFJ, 2001).

The deductible amount was increased substantially in 2000 to account for childcare costs as well. This will be discussed in more detail in the section on childcare below. Parents of children over 18 years old who are in education and living outside the parental home can deduct an additional 924€ per year from taxes (BMFSFJ 2005).

At first, in 1955, child benefits in West Germany were only introduced for third and subsequent children (table 4.1). The reasoning had been that incomes should be high enough to support a family of four (BMFSFJ 2001). In 1961 however, child benefits were extended to second children for lower income groups, and in 1975 to first and second children, independent of income. Child benefit payments for the first child were constant at DM 50 per month between 1975 and 1992, and at DM 70 be-

tween 1992 and 1995. (The deflated amounts thus ranged between 30 and 50 Euros<sup>10</sup>, in 2004 real values, between 1975 and 1995.) In 1996 then, when one first had to choose between benefits and tax deductions, child benefits were almost tripled. Child benefits were regularly increased between 1997 and 2002. Benefits for subsequent children have generally been higher. Especially for 3<sup>rd</sup> and higher order children, payments were quite high even as early on as 1975, when they had reached a value of DM 120 (127 Euros in 2004 prices). In 1981 they reached a high level of DM 240 (almost 200 Euros in 2004 prices).

In Britain, child benefit, formally Family Allowance, was also originally not paid for the first child, but only for subsequent children. In 1977, child benefits were introduced for first children as well. Until 1991, for married couples, they had been equal for all children. After that, opposite to Germany, they were generally higher for first than for subsequent children. The real values of child benefits increased steadily in the late 70s and early 80s, but then stagnated until 1999 around 80 Euros for the first child (2004 prices). In 1999, for the first time the child benefit for the first child of married couples was over 100 Euros (in 2004 prices).

In Britain, higher child benefit payments for first children of lone parents were introduced in 1977, but this was abandoned in 1998 for new claimants (IFS). In Germany, there has been no differentiation between lone and married parents in the level of child benefit payments.

Thus child benefit payments for the first child were generally higher in Britain than in Germany for married couples, and even more so for lone parents, until 1996. After that, they were about 50% higher in Germany than in Great Britain. For second children, differences were not that large before 1996, after which again there were strong increases in Germany. For third and subsequent children, benefits were usually substantially higher in Germany.

---

<sup>10</sup> See table 4.1. This table compares child benefit rates in the UK and Germany. Child benefits in the UK are paid on a weekly basis. Here they were multiplied by the average number of weeks per month, 4.35, to compare them to German monthly benefits. The figures in italics give values in EURO in 2004 prices. These are intended to allow a rough comparison over time and between countries. Only very rough comparisons are possible, because strictly comparable price indices for the period 1946-2004 were not available. For the UK, the long term indicator of prices of consumer goods and services provided by National Statistics was used. For Germany, a price index for West Germany, tailored to the expenses of four-person medium income families, provided by the Statistisches Bundesamt, was used until the year 2000. For the period after 2000, only a price index for East and West Germany combined was available. (Differences in inflation between the two parts of Germany had indeed decreased in the previous years). Child benefits for both the UK and Germany were transformed to 2004 values using these price indices. Then, the fixed exchange rate was used to transform DM into EURO, and the exchange rate for 2004 was used to transform pounds into EURO.

While in Great Britain child benefits are generally paid until the child is 16, and can be extended until age 19 if the child is enrolled in school, in Germany, they can even be received until the child is 27 if he or she is still enrolled in education (National Statistics).

Although in contrast to Britain lone parents did not receive additional child benefits in Germany, they had been eligible for an additional tax deduction until 2001, whereafter it was to be reduced on a stepwise basis until 2004. In 2004, a new tax deduction for single parents was introduced. The difference to the old tax deduction is that now household status instead of marital status determines whether a parent is considered a single parent or not. Apparently, unmarried cohabiting parents could previously also make use of the tax deduction for single parents. The new regulation is meant to only benefit single parents who are actually living alone with their children. In 2001, the old tax deduction for single parents was 2916 €. The new tax deduction introduced in 2004 is lower, only 1308€. However, the reasoning had originally been that higher general tax deductions for all children as well as higher child benefits would replace the extra tax deduction for single parents, following a constitutional court ruling of 1998 that married parents should not be excluded from additional tax deductions (REGIERUNGonline; Schratzenstaller 2002; BMFSFJ 2001).

In addition, single parents could deduct child care costs up to a certain level. This was extended to all parents in 2002. It appears that parents do not need to provide evidence of these costs, it seems that it is just a general tax deduction for all parents. There are additional tax deductions for children in education who live outside the parental home, and additional tax deductions requiring evidence of actual childcare expenses. These will be discussed in more detail in the section on childcare below (REGIERUNGonline; Schratzenstaller 2002; BMFSFJ 2001).

**Table 4.1: Child benefit rates per month  
(figures in italics are values in EURO in 2004 prices)**

United Kindom				Germany						
	First child (couple)	First child (lone parent)	Subsequent children		1. child	2. child	3. child	4. child	5. child	for income
06.08.1946	0.00£	0.00£	1.09£							
	<i>0</i>	<i>0</i>	<i>43</i>							
02.09.1952	0.00£	0.00£	1.74£							
	<i>0</i>	<i>0</i>	<i>47</i>							
				1.1.1955	DM 0	DM 0	DM 25	DM 25	DM 25	all
					<i>0</i>	<i>0</i>	<i>50</i>	<i>50</i>	<i>50</i>	
02.10.1956	0.00£	0.00£	2.18£							
	<i>0</i>	<i>0</i>	<i>51</i>							
				1.9.1957	DM 0	DM 0	DM 30	DM 30	DM 30	all
					<i>0</i>	<i>0</i>	<i>57</i>	<i>57</i>	<i>57</i>	
				1.3.1959	DM 0	DM 0	DM 40	DM 40	DM 40	all
					<i>0</i>	<i>0</i>	<i>74</i>	<i>74</i>	<i>74</i>	
				1.4.1961	DM 0	DM 25	DM 40	DM 40	DM 40	up to 7200
					<i>0</i>	<i>44</i>	<i>71</i>	<i>71</i>	<i>71</i>	
					DM 0	DM 0	DM 40	DM 40	DM 40	over 7200
					<i>0</i>	<i>0</i>	<i>71</i>	<i>71</i>	<i>71</i>	
				1.1.1964	DM 0	DM 25	DM 50	DM 60	DM 70	up to 7200
					<i>0</i>	<i>41</i>	<i>82</i>	<i>98</i>	<i>115</i>	
					DM 0	DM 0	DM 50	DM 60	70	over 7200
					<i>0</i>	<i>0</i>	<i>82</i>	<i>98</i>	<i>115</i>	
				1.1.1965	DM 0	DM 25	DM 50	DM 60	70	up to 7800
					<i>0</i>	<i>40</i>	<i>79</i>	<i>95</i>	<i>111</i>	
					DM 0	DM 0	DM 50	DM 60	DM 70	over 7800
					<i>0</i>	<i>0</i>	<i>79</i>	<i>95</i>	<i>111</i>	
24.10.1967	0.00£	0.00£	2.18£***							
	<i>0</i>	<i>0</i>	<i>37</i>							
09.04.1968	0.00£	0.00£	3.70£							
	<i>0</i>	<i>0</i>	<i>60</i>							
08.10.1968	0.00£	0.00£	4.35£							
	<i>0</i>	<i>0</i>	<i>71</i>							
				1.9.1970	DM 0	DM 25	DM 60	DM 60	DM 70	up to 13200
					<i>0</i>	<i>35</i>	<i>85</i>	<i>85</i>	<i>99</i>	
					DM 0	DM 0	DM 60	DM 60	DM 70	over 13200
					<i>0</i>	<i>0</i>	<i>85</i>	<i>85</i>	<i>99</i>	
				1.1.1972	DM 0	DM 25	DM 60	DM 60	DM 70	up to 1500
					<i>0</i>	<i>32</i>	<i>77</i>	<i>77</i>	<i>89</i>	
					DM 0	DM 0	DM 60	DM 60	DM 70	over 1500
					<i>0</i>	<i>0</i>	<i>77</i>	<i>77</i>	<i>89</i>	
				1.1.1973	DM 0	DM 25	DM 60	DM 60	DM 70	up to 16800
					<i>0</i>	<i>30</i>	<i>72</i>	<i>72</i>	<i>84</i>	
					DM 0	DM 0	DM 60	DM 60	DM 70	over 16800
					<i>0</i>	<i>0</i>	<i>72</i>	<i>72</i>	<i>84</i>	
				1.1.1974	DM 0	DM 25	DM 60	DM 60	DM 70	up to 18360
					<i>0</i>	<i>28</i>	<i>67</i>	<i>67</i>	<i>78</i>	
					DM 0	DM 0	DM 60	DM 60	DM 70	over 18360
					<i>0</i>	<i>0</i>	<i>67</i>	<i>67</i>	<i>78</i>	
08.04.1975	0.00£	0.00£	6.53£	1.1.1975	DM 50	DM 70	DM 120	DM 120	DM 120	all
	<i>0</i>	<i>0</i>	<i>52</i>		<i>53</i>	<i>74</i>	<i>127</i>	<i>127</i>	<i>127</i>	
06.04.1976	0.00£	0.00£	6.53£							

	0	0	44							
05.04.1977	4.35£	6.53£	6.53£							
	25	38	38							
03.04.1978	10.01£	14.36£	10.01£	1.1.1978	DM 50	DM 80	DM 150	DM 150	DM 150	all
	54	78	54		48	76	143	143	143	
13.11.1978	13.05£	21.75£	13.05£							
	70	117	70							
02.04.1979	17.40£	26.10£	17.40£	1.1.1979	DM 50	DM 80	DM 200	DM 200	DM 200	all
	83	124	83		46	73	184	184	184	
25.11.1979	17.40£	28.28£	17.40£	1.7.1979	DM 50	DM 100	DM 200	DM 200	DM 200	all
	83	135	83		46	92	184	184	184	
24.11.1980	20.66£	33.71£	20.66£							
	83	136	83							
23.11.1981	22.84£	37.19£	22.84£	1.2.1981	DM 50	DM 120	DM 240	DM 240	DM 240	all
	82	134	82		41	98	197	197	197	
22.11.1982	25.45£	41.33£	25.45£	1.1.1982	DM 50	DM 100	DM 220	DM 240	DM 240	all
	85	137	85		39	78	171	187	187	
21.11.1983	28.28£	45.89£	28.28£	1.1.1983	DM 50	DM 100	DM 220	DM 240	DM 240	lb
	90	146	90		38	75	166	181	181	
					DM 50	DM 70	DM 140	DM 140	DM 140	hb
					38	53	106	106	106	
26.11.1984	29.80£	48.29£	29.80£							
	90	146	90							
25.11.1985	30.45£	50.24£	30.45£							
	87	143	87							
28.07.1986	30.89£	50.90£	30.89£							
	85	140	85							
06.04.1987	31.54£	51.98£	31.54£							
	84	138	84							
11.04.1988	31.54£	52.85£	31.54£							
	80	133	80							
10.04.1989	31.54£	54.16£	31.54£							
	74	127	74							
09.04.1990	31.54£	55.90£	31.54£	1.7.1990	DM 50	DM 130	DM 220	DM 240	DM 240	lb
	67	120	67		34	88	149	162	162	
					DM 50	DM 70	DM 140	DM 140	DM 140	hb
					34	47	95	95	95	
08.04.1991	35.89£	60.25£	31.54£							
	73	122	64							
07.10.1991	40.24£	64.60£	32.63£							
	81	131	66							
06.04.1992	41.98£	67.43£	33.93£	1.1.1992	DM 70	DM 130	DM 220	DM 240	DM 240	lb
	82	131	66		44	81	138	150	150	
					DM 70	DM 70	DM 140	DM 140	DM 140	hb
					44	44	88	88	88	
12.04.1993	43.50£	69.82£	35.24£							
	83	134	68							
11.04.1994	44.37£	71.12£	35.89£	1.1.1994	DM 70	DM 130	DM 220	DM 240	DM 240	lb
	83	133	67		41	76	129	141	141	
					DM 70	DM 70	DM 140	DM 140	DM 140	hb
					41	41	82	82	82	
					DM 70	DM 70	DM 70	DM 70	DM 70	*
					41	41	41	41	41	
10.04.1995	45.24£	72.65£	36.76£							
	82	131	67							
08.04.1996	46.98£	74.39£	38.28£	1.1.1996	DM 200	DM 200	DM 300	DM 350	DM 350	all**
	83	131	68		114	114	171	200	200	
07.04.1997	48.07£	74.39£	39.15£	1.1.1997	DM 220	DM 220	DM 300	DM 350	DM 350	all**
	82	127	67		123	123	168	196	196	
06.04.1998	49.81£	74.39£	40.46£							

	82	123	67							
12.04.1999	62.64£	74.39£	41.76£	1.1.1999	DM 250	DM 250	DM 300	DM 350	DM 350	all**
	102	121	68		138	138	166	193	193	
10.04.2000	65.25£	76.34£	43.50£	1.1.2000	DM 270	DM 270	DM 300	DM 350	DM 350	all**
	103	121	69		147	147	163	190	190	
09.04.2001	67.43£	76.34£	45.02£							
	105	119	70							
11.04.2002	68.51£	76.34£	45.89£	1.1.2002	154	154	154	179	179	all**
	105	117	70		EURO	EURO	EURO	EURO	EURO	
					158	158	158	184	184	
07.04.2003	69.82£	76.34£	46.76£							
	104	114	70							
05.04.2004	71.78£	76.34£	48.07£							
	104	110	69							

\*over 75000 DM (single parents); over 100000 DM (married parents)

\*\* (but need to choose between child benefit and tax deduction)

\*\*\* Family Allowance for fourth and subsequent children was £3.26 between 1967 and 1968

lb= up to low income boarder

hb = over high income boarder

There were additional benefits for those who could not entirely make use of tax deductions for children between 1986 and 1995

Sources: Child Benefit rates UK: The Institute for Fiscal Studies (IFS). Fiscal facts.:

<http://www.ifs.org.uk/ff/childben.xls>; child benefit rates Germany: Bundesministerium für Familie, Senioren, Frauen und Jugend (2001) and REGIERUNGonline – Chronologie der Familienpolitik:

[http://www.bundesregierung.de/servlet/init.cms.layout.LayoutServlet?global.naviknoten=12030&link=bpa\\_notiz\\_druck&global.printview=2&link.docs=37532](http://www.bundesregierung.de/servlet/init.cms.layout.LayoutServlet?global.naviknoten=12030&link=bpa_notiz_druck&global.printview=2&link.docs=37532)

Price indices: Statistisches Bundesamt: <http://www.destatis.de/print.php>; National Statistics:

<http://www.statistics.gov.uk/statbase/TSDdownload2.asp>; Exchange rates: Deutsche Bundesbank:

[http://www.bundesbank.de/statistik/statistik\\_zeitreihen.php](http://www.bundesbank.de/statistik/statistik_zeitreihen.php)

### 4.3 Tax benefits for married couples

An additional source of financial support for families is tax deductions for married couples. Although these are not conditional on having children, in practice, families with children will often profit. In Germany, the special nature of the tax system makes it a lot easier financially for one partner to stay at home or to work very few hours. Given the lack of alternatives, this is what many parents then decide to do when it comes to providing care for young children. In Germany, married couples can split the sum of their two incomes by two. This is then the taxable amount for each partner. Because of the progressive tax system, couples with very unequal earnings, or where one partner has no earnings at all, will profit the most. Thus, the German tax system has often been characterized as supporting the traditional male-breadwinner model of the family. Daly (2000) cites calculations by Shaver and Bradshaw (1993), according to which the disposable income differential between married couples and singles is 10% in Germany and 4% in Great Britain at average income.

In Britain, married couples paid taxes on the sum of their earnings until 1990. The logic behind this joint taxation, as expressed in the 1970 Income and Corporation Taxes Act, had been that women's incomes were to be treated as their husbands' incomes. In 1990, separate taxation was introduced (Adam 2004; Gregg et al. 2003).

Figure 4.1 illustrates the structure of taxation in Great Britain and Germany. In both countries, a certain amount of income, known as a personal allowance, is freed from taxation. All earnings above that amount are subject to taxation. The y-axis in figure 4.1 gives the marginal tax rate. Both countries have progressive tax systems, where the rate of taxation increases for additional units of income. The total amount of taxes a person pays on his or her earnings is represented by the area underneath the curve, up until the person's level of earnings on the x-axis. The system of taxation in Britain is somewhat simpler. There, the marginal tax-rate is represented by a step-function, instead of a piece-wise linear function as in the German system. The joint taxation of married couples in Britain before 1990, illustrated in the upper left-hand panel of figure 4.1, actually led to a higher taxation of dual-earner married couples than of singles. In figure 4.1, individualized tax rates are shown. The 'married' tax rate shown here can be interpreted as the tax rate that applies to the income of an individual who is married. The British joint taxation before 1990 could alternatively have been illustrated as, first, one spouse's income taxed at a normal rate. The taxation of the second spouse's income would then be extremely high. Since it is simply added to the first spouse's income, the starting rate would correspond to the rate at which the first spouse's income left off. Instead of that mode of illustration, I choose to leave it undetermined which spouse's income is the first and which is the second income. The graph here just shows the taxation of a married individual's income whose spouse is earning the same amount; the spouse is also being taxed at the same rate, and it does not matter which one we are looking at. In any case, this shows that individuals married to another person earning an income were taxed much more strongly than unmarried individuals. Married couples however had a higher tax-free allowance than singles, though always less than doubled as high, that is, they had less of a tax-free allowance than two singles. Still, if the wife was not working (it had to be the wife – Married Couple's Allowance was Married Man's Allowance before 1990), a married man was taxed slightly less than a single.

While in Britain dual-earner married couples were taxed even more strongly than singles before 1990, in Germany, taxation of married couples with equal earnings

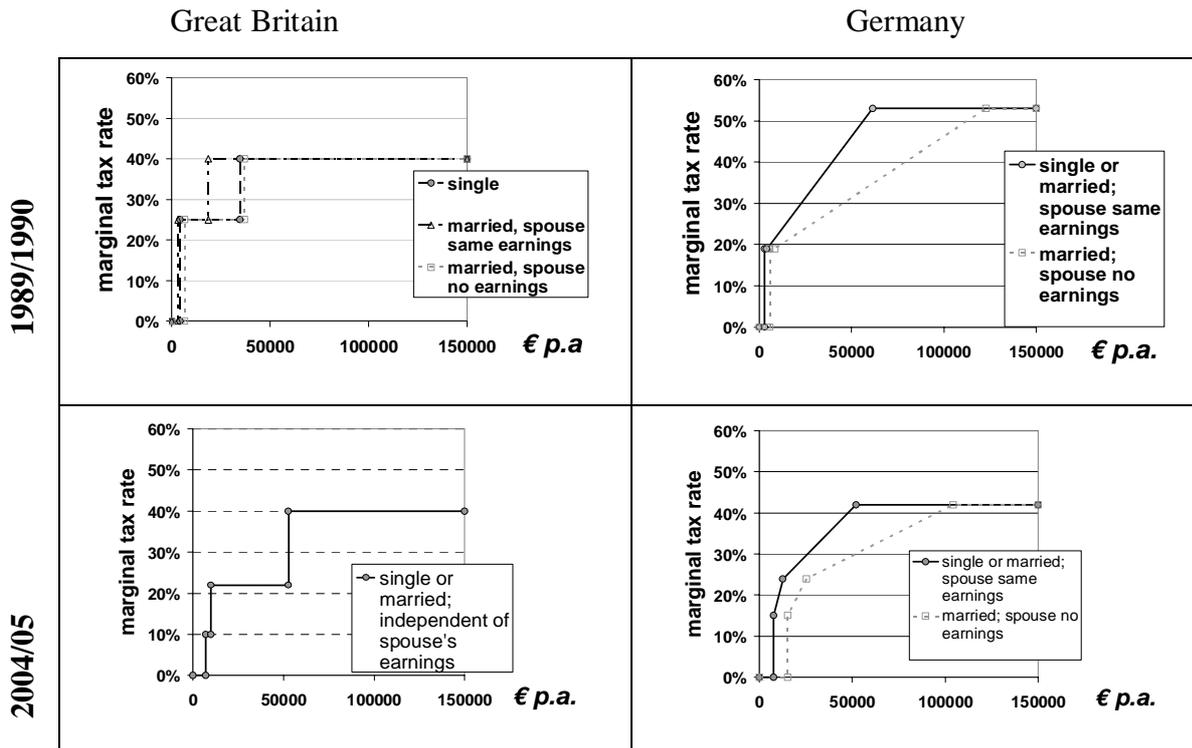
was the same as for singles. However, married couples with unequal earnings profited as compared to singles, and the more so the more unequal their earnings. Though marginal tax rates have been subject to some alterations, the principle of income-splitting, and thus the advantaged position of married couples with unequal earnings, still applies in 2005.

The lower left-hand panel in figure 4.1 illustrates the system of separate taxation in Great Britain, introduced in 1990. In this system, neither are people married to another earner taxed more strongly than singles, as was the case before 1990 in Great Britain, nor are individuals married to someone with lower earnings benefited in taxation, as is the case in Germany. Separate taxation thus does not provide a disincentive for married couples to have equal earnings, as is the case in either of the other two systems.

Separate taxation frees two-earner couples from taxation of a higher total amount of income than one-earner couples because they are able to make use of two full personal allowances (Gregg et al. 2003; Gustafsson et al. 1996). Therefore, it is seen to enhance the incentive for couples to have two incomes, especially for one partner to switch from non-employment to working part-time (Gregg et al. 2003).

Married Man's Allowance was converted to Married Couple's Allowance in 1990; it could then be claimed by either spouse (Adam 2004). However, it was abolished in 2000 (Rake 2001; Gregg et al. 2003; Adam 2004). There was also an allowance for single parents, which amounted to the same as the Married Couple's Allowance. Therefore, parents with children were treated the same whether or not they were married; but people without children were treated unequally on the basis of marriage. Single parent's allowance was abolished along with married couples allowance in 2000 (Adam 2004).

figure 4.1: individualized tax rates



source: Hoereth, Zipfel (2001); Bundesministerium der Finanzen (2005); Adam (2004); Institute for fiscal studies (2005); own calculations

#### 4.4. Support for low income families

##### 4.4.1 Family Credit and Working Family Tax Credit in the United Kingdom

Support for low-income families has traditionally been the main focus of family policy in Great Britain. Family Income Supplement (FIS) was introduced in 1971 as a benefit for low-income families with a dependent child with at least one member working at least 24 hours. In 1988, FIS was renamed Family Credit (FC). Soon after, the amount of hours recipients were required to work was reduced to 16 and in November 1993, a childcare disregard was introduced. A maximum payment of FC was available to families earning less than a specified threshold. If a family's earnings were above this threshold, FC was reduced by 70% of the amount the family earned in excess of the threshold (Dilnot and McCrae 2000; Randall 1996)

The Labour government, elected in 1997, introduced a number of labor market and family policy reforms, which were called 'New Deal' programs. As a part of

these reforms, Family Credit was transformed to Working Family Tax Credit (WFTC), which came into force in October 1999. The earnings threshold for WFTC is higher than for Family Credit, and the 70% taper was reduced to 55%, increasing the incentive to attain higher earnings. An especially interesting part of WFTC is the childcare benefit, replacing the childcare disregard. Lone parents receiving WFTC as well as couples where both partners work 16 hours or more are eligible for this childcare credit (Dilnot and McCrae 2000). It covers 70% of childcare costs of up to £100 a week for one child and £150 for two or more children (Rake 2001). Not many parents had made use of the childcare disregard element of Family Credit, which generally did not result in a very high level of compensation. However, the level of compensation through the new childcare element in WFTC is much higher (Dilnot and McCrae 2000; Duncan, Paull, and Taylor 2001). A positive effect on employment levels is expected especially for single parents. There is some concern, though, that despite the childcare element, the higher earnings threshold and higher level of payment of WFTC as compared to FC will strengthen the disincentive for second earners to work (Rake 2001; Dilnot and McCrae 2000; Duncan, Paull, and Taylor 2001). In any case, WFTC undoubtedly improved the economic situation of low-income families (Dilnot and McCrae 2000).

WFTC, as well as the child support element of Income Support, described below, were replaced by Working Tax Credit and Child Tax Credit in April 2003. These however upheld the main elements of WFTC. For a short time, there was an additional income-tested benefit, Children's Tax Credit. However, this was also replaced by the new benefits in April 2003 (Inland Revenue 2002; Rake 2001).

#### **4.4.2 Introduction of a family income supplement in Germany**

In Germany, there has not traditionally been any taper regulation for financial support for low income families. In 2005, however, an income supplement for families with children was introduced that is in some ways similar to WFTC. If the amount of income that parents earn is higher than the threshold for *Arbeitslosengeld II* that would apply to them if they did not have children, but lower than the threshold for their household including their children, they can receive a supplement of up to 140€ per month and per child. Similar to the British regulation, 70% of what parents earn in

excess of their own threshold (the threshold that would apply to them if they did not have children) is subtracted from these 140€. Since they can still keep part of the 140€ per child, this provides somewhat of an incentive to earn an own income, even if it is only slightly above the threshold. If their income is above the threshold that actually applies to their whole family, they do not receive any supplement (REGIERUG-online).

#### **4.4.3 Support for families with no or little income**

Income Support is a low-level benefit in the UK for households with no or low earnings and with no member working more than 16 hours a week. There is a child support element to Income Support, and formerly, there was a Lone Parent Premium to Income Support, which was dropped by the Labour government (Rake 2001). However, overall rates of Income Support for families with children were increased. The levels of Income Support received by families with children are still below the poverty level though (Piachaud 2001). Lone parents do not need to register as unemployed and can receive Income Support until their child reaches the age of 16. However, since April 2000, lone parents are requested to attend an interview with a personal advisor to work out a possible plan for returning to work. While Income Support is reduced if they do not attend the interview, the benefit is not conditional on actually entering the labor market (Rake 2001; DfEE 1998). Lone parents also had access to permanent social housing, but this was reduced in 1996 (Pascall 1999).

### **4.5 Childcare**

#### **4.5.1 Financial support for childcare costs**

In Germany, up to 2000, only single parents could deduct a certain amount from taxes for childcare costs, as mentioned earlier. In 1998, however, the constitutional court ruled that married couples could no longer be excluded from tax deductions for childcare costs. Since 2000, then, all parents can deduct 1546€ (later increased to 1548€) for childcare costs. In 2002, the deductible amount was increased to 1080€ per parent

(that is to a sum of 2160€) to cover childcare and education costs, even if the child is over 16 years old. As mentioned above, it does not seem that parents need to provide evidence of actual childcare costs in order to make use of these tax deductions. However, they do need to choose between child benefits and the sum of this tax deduction and the general tax deduction for children described in section 1.1. Therefore, these tax deductions are only relevant for parents with relatively high income. From 2002 up to the present, if parents spent more than 1548€ per year on childcare, they could make an additional deduction of up to 1500€ for children under 14 years of age. Here, though, parents do need to give evidence of actual childcare expenditures. They also both need to be either employed or in education or have a long-term disablement or illness. Parents can make use of both this tax deduction and child benefits, they do not have to choose between the two. Single or separated parents can deduct half of this amount, and only have to spend half of the threshold on childcare costs to qualify for this deduction. Recently, the government has debated a change in this regulation by which parents can also deduct spendings on childcare if they are lower than 1548€ (Spiegel Online, 14.12.05; Spiegel Online, 21.12.05; BMFSFJ, 2001; BMFSFJ, 2005; REGIERUNGonline; Bundesrat, 2001).

On Tuesday, the 31.1.06, the government coalition found a compromise for a new deduction policy for childcare costs. Families in which both parents work, as well as single parents, can now deduct 2/3 of childcare costs from taxation up to a maximum amount of 4000 Euros, for children aged 0-14. For two parent households where only one parent is working, the same amount of childcare costs is freed from taxation, but only for children aged 3-6. This compromise has ensued from a conflict between the coalition partners on whether only the amount of childcare costs exceeding 1000 Euros (up to a maximum amount) should be freed from taxations, or whether all childcare costs (up to a maximum amount) should be freed from taxation. The proponents of the second solution had wanted to ensure that low income families who spend less on childcare can also profit. The compromise is now that 2/3 of childcare costs, whatever the amount, are freed from taxation, up to a maximum of 4000 Euros. There had also been controversy over the question of whether two parent households with only one working parent should also benefit. The compromise was to include them partially, for children aged 3-6 (Fried and Schiegl 2006).

Berth (2006) provides 3 case scenarios in the *Süddeutsche Zeitung*. In the first example, a single mother with 2100 Euros pre-tax income, paying 1920 Euros a year

for a day nursery place, now saves 366 Euros a year in taxes, as compared to only 115 Euros in the old system where she could only deduct the amount from taxation that exceeded 1500 Euros. In the second example, a family where the father earns 2500 Euros a month and the mother is not working is paying 93 Euros a month for a half-day kindergarten place. In the old system, they could not make any tax deductions because only one parent was working. In the new system, they can save 164 Euros a year. In the last example, a dual earner couple with a combined income of 80000 Euros a year pay 100 Euros per month for a half-day kindergarten place and 700 Euros a month for a nanny. In the old system, they could only deduct a maximal amount of 1500 Euros from taxation, in the new system, the maximum is 4000 Euros. Therefore, now they can save 1146 Euros a year, whereas before they could only save 435 Euros.

Previously single parents as well as married couples with at least two children could also deduct expenses for a socially insured household employee from taxes (in 2000: up to DM 12000). This was abolished in 2002 (BMFSFJ, 2001; REGIERUNGonline).

Thus in Germany, financial aid for childcare costs exclusively takes the form of tax deductions. These of course benefit high income families more than low income families. But even for higher income families, the amount saved through these tax deductions cannot come close to covering costs for a full-time nanny, for instance, although this may be the only possible source of childcare for many families in western Germany. The British childcare benefit element of WFTC for low income families described above, by contrast, is not in the form of tax deductions, but amounts to a direct cost assistance of up to somewhat more than 5300€ a year for families with one child and 8070€ for families with two or more children. So, effective levels of childcare assistance in Germany will still be lower even for high income families than childcare benefit levels for low income families in Britain. The regulation in Britain is however very new. It remains to be seen how well it helps low income families cope with childcare costs.

## **4.5.2 The childcare infrastructure**

### **4.5.2.1 United Kingdom**

Childcare has traditionally been considered a private matter in Britain, and public childcare was only provided for children thought to be “in special need” (Randall 1996). Under the Major government, plans for the introduction of a childcare voucher scheme were made (Randall 1996). However, after the election of the Labour government, this scheme was dropped again. Instead, a strategy to provide school age children with out of school services was introduced. Also, as initiated earlier, four-year-olds were given an entitlement to a free nursery place, and it was planned to accommodate 66% of 3-year-olds by 2002. However, these entitlements involve an average of only 12.5 hours of childcare a week (Rake 2001, Randall 1996). Thus, public provision of childcare was very low even for 3 and 4 year olds for the greatest part of the 1990s. As described above, a childcare credit was introduced together with the WFTC at the end of 1999, which may have a positive effect on the affordability of childcare for low-income families.

In Britain, it is customary to distinguish between child care and early years education. Between 1998 and 2003, there has been a considerable expansion in places in day nurseries following a government incentive to improve early years education. Providers who could offer the early years curriculum for 3 and 4 year olds qualified for financial support. Day nursery places tended to replace childminders and playgroups during this time, as the latter usually only offered care but not education and could not receive funding. The greatest part of child care and nursery education in Britain is offered by private sector providers. The public funding received by those offering the early years curriculum is time-limited and is only intended to aid in founding new childcare places. It is expected that the new day nursery places will be self-sustaining in the long run. However, it is not clear whether this is realistic, as about half of the newly founded places had to be closed again. The funding is from the central government, in contrast to Germany where kindergartens are funded mainly by the municipalities (Evers et al. 2005).

These developments are reflected in the report by the Department for Education and Skills (2001) that the provision of places in day nurseries has increased throughout the 1990s. Places with childminders increased until the mid-90s and then

dropped again, and places in play groups and preschools dropped somewhat. The majority of places were not provided by local authorities, but by other registered persons or organizations (Department for Education and Skills 2001).

Given that most child care is to be found in the private sector, difficulties in affordability and availability may become evident in patterns of childcare usage. In an analysis of data from the NCDS, Ward, Dale and Joshi (1996) study a cohort of women aged 33 in 1991, focusing on married and employed mothers of children under 5 years of age. They found that this group of mothers relied heavily on informal childcare. This applies especially to those employed part-time. Of those employed part-time 53%, and of those employed full-time 32%, exclusively use informal care, 11% of those employed part-time and 29% of those employed full-time exclusively use formal childcare, with all others using different kinds of combination of formal and informal care (Ward, Dale, and Joshi 1996). This high degree of reliance on informal childcare among employed mothers may reflect the scarcity of affordable formal childcare, at least at the beginning of the 1990s.

In a study based on a nationally representative survey of parents with children aged under 14, carried out in 2001 as a follow-up of a baseline survey conducted in 1999, Woodland, Miller, and Tipping (2004) found that households with two working parents still appear to rely heavily on informal childcare in 2001. Figures referring specifically to working parents, though, are not disaggregated by age of child. General results by Woodland, Miller, and Tipping (2004) indicate that use of formal childcare was highest for children aged 3-4. Use of informal childcare was stronger among younger and older children. No use of childcare was also most common for children aged under 3 and over 4. Use of formal childcare was found to strongly rise with household income, and no use of childcare was most prevalent among low-income households. Of households using childcare for preschool age children, 50% paid fees or wages in the reference week (Woodland, Miller, and Tipping 2004).

According to the results of annual surveys conducted between 1997 and 2001 of parents of three and four year old children, reported by Bell and Finch (2004), there is an increase during this time in the use of childcare and nursery education especially for younger 3-year-olds and older 4-year-olds. Use of nursery education seems to have become almost universal for older 3-year-olds and 4-year-olds by 2001 and was already very high by 1997 (Bell and Finch 2004)

Thus, provision of formal child care seems to have improved over the 1990s in Great Britain for 3 and 4 year olds. However, parents still seem to largely have to choose between either using informal child care or paying fees for formal child care, especially for children aged under 3 or over 4.

#### 4.5.2.2 Western Germany

Childcare in Germany is primarily organized at the municipal level. Providers in western Germany are for the most part voluntary sector providers. These are mainly churches and *Wohlfahrtsverbände*, large non-profit welfare organizations (Evers et al. 2005). In 2002, 64% of childcare facilities in western Germany were run by voluntary organizations, a decline from 67% in 1990. The most important voluntary sector providers were the *Caritas*, the *Diakonisches Werk* (which are *Wohlfahrtsverbände* associated with the catholic and protestant churches), as well as local church communities. Most childcare facilities that are not run by voluntary providers are run by the municipalities themselves (Statistisches Bundesamt 2004).

Financing mainly comes from the municipalities, which distribute funds to the *Wohlfahrtsverbände*. The municipalities are to a small extent compensated by the *Länder*. To a declining extent, the voluntary sector organizations additionally make own financial contributions. Part of the costs are also covered by the parents. In 2002, parents paid for 23% of costs. The fees paid by parents depend on their income. Child care places are free for parents drawing social assistance (Evers et al. 2005).

Like in Britain, there have been efforts by the federal government to improve childcare provision in recent years. Since the implementation of the 1992 Child and Youth Act in 1999 in Germany, children aged 3-6 have a legal right to a childcare place. There was indeed a strong increase in kindergarten places for this age group. Around 600,000 new places were created in western Germany between 1992 and 1999, though mostly only for part-time care (Evers et al. 2005).

This is reflected in the augmentation of the rate of provision of kindergarten places for children aged 3 - 6½, from 69% to 88% between 1990 and 2002. However, in 2002, only 21% of children in this age group were provided with a full-day kindergarten place (Statistisches Bundesamt 2004b). In western Germany, formal childcare is mainly limited to half-day care for 3-to-6½-year-olds. In 2002, the rate of provision

of formal childcare for children aged 0-3 was 2.8% for western Germany without Berlin (Statistisches Bundesamt 2004). This represents a slight increase as compared to the provision rate of about 1% in 1990 (Statistisches Bundesamt 2004b; Konietzka and Kreyenfeld 2004). The increase in this rate was due partly to a decline in the number of children, partly to an increase in the number of places (Statistisches Bundesamt 2004b).

Thus, there is great shortage in child care provision for children aged 0-3. There has been some effort by the federal government to improve the situation. The *Tagesbetreuungsausbaugesetz* (TAG), a law requiring the municipalities to extend childcare provision for children aged 0-3 to cover demand by 2010, came into force at the beginning of 2005. There are however no binding rates of child care provision that need to be achieved. The federal government has argued that demand for child care varies regionally. The municipalities are expected to determine the level of demand locally and improve provision accordingly until 2010, following own time schedules. Also, there is to be no legal right to a childcare place for children aged under 3, in contrast to those aged 3-6. The necessary financial means are planned to ensue from savings through the reform of the German social assistance and unemployment benefit system. There has however been some doubt whether the reform will result in actual savings (Evers et al. 2005; BFSFJ 2004; Bundesgesetzblatt, G5702; Ausgegeben zu Bonn am 31. Dezember 2004; 2004 Nr. 76)

A possible, though costly, alternative when provision rates are low are child-minders. In contrast to Britain, however, childminders in Germany do not need to be registered. Therefore, their number is difficult to estimate (Evers et al. 2005).

## **4.6 Maternity/ paternity leave and parental leave**

### **4.6.1 United Kingdom**

In both Germany and the UK, there has traditionally been a distinction between maternity leave and parental leave. Maternity leave is taken right around the birth of the child, while parental leave can be taken later and can often also be taken by fathers. As a counterpart to maternity leave, paternity leave has also recently been introduced in the UK.

In the UK, maternity leave was introduced in 1976 (table 4.2). Then, maternity leave was conditional on working 2 years for ones employer, or 5 years if working for less than 16 hours a week. Starting in 1977, there were 6 weeks of maternity pay at 90% of the previous salary and 18 weeks of state-paid flat-rate maternity allowance. In 1987 the latter became conditional on having been insured for 6 months of employment. Starting in 1994, there no longer were any differences in maternity leave regulations by hours of work. All women had a right to 14 weeks of leave, but those working for their employer for two years had a right to an additional 14 weeks of leave, and insured employees had a right to paid leave, though only for a maximum of 18 weeks. Regular and additional leave were extended in 2000, and only 1 year continuous employment was required for additional leave. In 2003, for children born after 6 April 2003, more extensive leave regulations were introduced. Maternity leave was extended to 26 weeks paid and 26 weeks unpaid leave. Eligibility for different forms of maternity pay became dependent on income. Additionally, fathers can now take two weeks paid paternity leave. For mothers, benefits cover 90 percent of average weekly earnings for the first six weeks and 100 £ per week for the remaining 20 weeks (Department of Trade and Industry 2003; Gregg, Gutiérrez-Domènech, and Waldfogel 2003; European Commission 2002a).

In addition to maternity and paternity leave, parental leave was introduced in December 1999. The difference to maternity and paternity leave is that parental leave can be taken at any time up to the child's 5<sup>th</sup> birthday. Parental leave involves the right to 13 weeks unpaid leave per parent (European Commission 2000b; European Commission 2002a; Department of Trade and Industry, 2002).

#### **4.6.2 West Germany**

In West Germany, maternity leave was introduced in 1952, much earlier than in Britain. However, the duration of leave, at 12 weeks (14 in 1965) was at first shorter than in Britain. In Britain, total maternity leave duration was almost 10 months from the start, though not all paid. In West Germany, on the other hand, all of maternity leave was paid and there were no tenure conditions tied to maternity leave as there were in Britain. Total leave durations started increasing in West Germany with the introduction of 4 months unpaid parental leave in 1979 in addition to the 14 weeks maternity

leave. Parental leave further increased to 10 months in 1986, 15 months in 1987, 18 months in 1990 and 3 years in 1992. In contrast to maternity leave, parental leave was at first unpaid when it was introduced in 1979. In 1986, a state paid allowance of DM 600 was introduced for the duration of parental leave. In 1987, the allowance was extended to 12 and then 15 months. However, the allowance became means-tested after the first 6 months. In 1990 the duration that the allowance was paid was extended together with parental leave to 18 months, and in 1993 to 2 years. In 1994, the allowance became means tested during the whole duration, that is, even in the first 6 months. In 2001, then, parents were given the option of receiving DM 600 per month for two years, or DM 900 for one year.

Thus, between the introduction of maternity leave in Britain in 1976, and the extension of the sum of leave to 13 ½ months in 1986 in Germany, total leave duration was longer in Britain than in Germany. Since 1986 though, total leave duration has been extended much more strongly in Germany, and has been substantially longer in Germany for the whole time period from 1986 to the present.

Since 1986, it is also possible to work part-time during parental leave. At first, parents could work up to 19 hours a week during leave and still receive the means-tested allowance if their income was not too high. Since 2001, they can work up to 30 hours a week. They even have a right to part-time work during up to 3 years of parental leave if their firm has more than 15 employees.

In contrast to Britain, there is no paternity leave in Germany, i.e., a short, paid break for fathers right around the birth of their child. However, in Germany, fathers have been able to take parental leave since 1986, in contrast to Britain, where parental leave was not introduced until 1999 (in addition to maternity leave which was introduced much earlier, in 1976). But, not until 2001 could both parents take parental leave at the same time in Germany. Table 4.2 gives an overview of dates of introduction of leave regulations in the two countries and subsequent alterations.

In Germany, it is forbidden for women to work for 8 weeks after giving birth (BMFSFJ 2005). In Britain, mothers are only prohibited from working for 2 weeks after giving birth, or 4 weeks if they are working in a factory (DTI 2002). In both countries, women are protected from dismissal during this period. Nonetheless, the very long period of exclusion from work may be a further disincentive for women in Germany to decide to have a child, especially if they are working on time-limited contracts or fear that it will in some way be detrimental for their employment situation.

**Table 4.2: leave regulations in Great Britain and (West) Germany**

	<b>Great Britain</b>	<b>(West) Germany</b>
1952		<b>Introduction of <u>maternity leave</u>:</b> Paid leave: 6 weeks before and 6 weeks after childbirth
1965		<b>Changes to maternity leave:</b> leave after childbirth extended to 8 weeks
1.6.1976	<b>Introduction of <u>maternity leave</u>:</b> <b>Duration:</b> from 11 <sup>th</sup> week prior to the expected week of childbirth until 29 weeks after childbirth <b>Condition:</b> to have worked for 2 years and at least 16 hours per week, or 5 years and at least 8 hours per week, for the same employer until the 11 <sup>th</sup> week prior to the expected week of childbirth	
4.1977	<b>Introduction of <u>maternity pay</u></b> <b>Pay:</b> 6 weeks at 90% of salary; 18 weeks flat-rate maternity allowance <b>Conditions:</b> same as for maternity leave	
1979		<b>Introduction of <u>parental leave</u>:</b> only for mothers, to be taken directly after maternity leave, four months duration, unpaid
1986		<b>Changes to parental leave:</b> extension to 10 months; state paid allowance of DM 600, may work up to 19 hours/week, now for fathers as well
1987	<b>Changes to maternity leave:</b> employment with same employer now has to be until 15 <sup>th</sup> week prior to the expected week of childbirth, but otherwise same tenure requirements; The 18 weeks flat-rate pay become conditional on having had 6 months insured employment in the last year, but one no longer has to have been employed with same employer for 2 years to receive flat-rate (but 2 years (5 years part-time) tenure are still necessary for right to retain job and to receive pay at 90% for 6 weeks); now a higher flat rate (£32.85) is paid by employer instead of state if 6 months insured employment with same employer into 15 <sup>th</sup>	<b>Changes to parental leave:</b> since beginning of 1987: state paid allowance for 12 months, July 1987: allowance for 15 months; means-tested after 6 months

	week before expected week of child-birth, otherwise lower (£30.05) state-paid flat-rate if 6 months insured employment into 15 <sup>th</sup> week before expected week of childbirth with different employers	
1990		<b>Changes to parental leave:</b> 18 months state-paid allowance
1992		<b>Changes to parental leave:</b> duration of parental leave is extended beyond duration of state-paid allowance to 3 years
1993		<b>Changes to parental leave:</b> 24 months state-paid allowance
1994	<b>Changes to maternity leave:</b> 14 weeks unconditional leave, but if 2 years tenure, 14 additional weeks; for height of pay, still tenure requirements, but shorter: 26 weeks insured employment with same employer into 15 <sup>th</sup> week before expected week of childbirth for 6 weeks pay at 90% of average earnings and 12 weeks flat-rate pay (£52.20); if insured employment for one year (increased from 6 months) with different employer: 18 weeks state-paid flat-rate (£52.20)	<b>Changes to parental leave:</b> means-tested even in first 6 months
1999	<b>Introduction of parental leave:</b> 13 weeks unpaid leave per parent; can be taken at any time up to the child's 5 <sup>th</sup> birthday	
2000	<b>Changes to maternity leave:</b> 18 weeks unconditional leave. If 1 year continuous employment: 11 additional weeks of leave; for pay still same tenure requirements and same durations of pay, but increase in employer-paid flat rate to £75 a week; state-paid flat rate becomes dependent on average earnings, standard rate is £75	
2001		<b>Changes to parental leave:</b> instead of an allowance of DM 600 for 2 years, now one can also choose an allowance of DM 900 for one year Now both parents can take up to 3 years of parental leave at the same time May work for up to 30 hours a week and still receive allowance (if income is not too high) If employed in a firm with more than 15 employees, parents now have a right to part-time work during these 3 years of parental leave

		The third year of parental leave can be taken up to the child's 8 <sup>th</sup> birthday with consent of the employer
2002		<b>Changes to maternity leave:</b> Mothers of children born before expected date now also have a guaranteed maternity leave of 14 weeks
2003	<b>Changes to maternity leave:</b> unconditional leave extended to 26 weeks, additional leave for those employed continuously for 1 year also extended to 26 weeks; changes in conditions for maternity pay: instead of having to be employed with same employer, now has to be continuously employed for 26 weeks into 15 <sup>th</sup> week before childbirth and earn at least £77 to still receive 6 weeks at 90% of pay, but now 20 weeks employer-paid flat-rate of now £100; changed condition for now 26 weeks state-paid flat-rate of up to £100: now for all employees and self-employed who earn at least £30 <b>Introduction of <u>paternity leave</u>:</b> 2 weeks paid leave for fathers	
Future plans for 2007		There are plans to couple parental leave pay to previous earnings: parents would receive 67% of previous earnings up to a maximum of 1800€ per month for 1 year

Source: Gregg, Gutiérrez-Domènech, and Waldfogel (2003); Kreyenfeld (2001); BMFSFJ (2001); REGIERUNGonline; BMFSFJ: Redeabdruck 1.12.05; McRae (1991); Freedland (1976); Reid (1976); Dex et al. (1996)

#### 4.7 Attitudes towards maternal employment.

Scott (1999) presents analyses of data on attitudes towards maternal employment from the 1994 International Social Survey Programme. Measuring the average extent of disagreement with the statement that preschool children suffer from maternal employment, Scott (1999) finds that, of the eight European countries studied, respondents in Britain were among the most liberal, comparable only to Sweden. Austrian and West German respondents believed most strongly that pre-school children would suffer. However, while people in Britain did not seem to think that pre-school children suffer from their mothers' employment, they also did not tend to think that mothers of preschool children should work. Only 38% of the respondents agreed with the state-

ment that mothers of preschool children should work, only slightly more than in western Germany, which had the lowest value of the eight countries. Of course, it is difficult to say how respondents interpreted this statement, whether as an imperative or as an option. On the other hand, 91% of respondents in Britain agreed that mothers of school-age children should work. Among the eight countries studied, this value was comparable only to the Netherlands and Sweden. Of West German respondents, only slightly more than 70% agreed, the lowest value among the countries studied. Using more recent data, Geisler and Kreyenfeld (2005) find that the percentage of people in western Germany agreeing with the statement that small children suffer from their mothers' employment has decreased somewhat between 1992 and 2004, from 74% to 62%.

Thus, it appears that people in Britain, while they seem to be somewhat ambivalent in their attitudes, are generally more approving of maternal employment than are people in western Germany.

#### **4.8 Conclusion**

While child benefits may cover a sizeable portion of direct child-related costs (at least in Germany after rates were increased substantially in 1996 and the following years) they certainly cannot come close to compensating for opportunity costs of leaving the labor market to care for children. This is especially relevant in Great Britain and western Germany, where the childcare infrastructure is so poor. Paid parental leave and rights of reinstatement may compensate for or help to avoid opportunity costs to some extent. Coupling parental leave pay to previous income is a tool often used when the goal is to partially compensate for opportunity costs. In both Britain and Germany, this has only been practiced for relatively short durations of maternal leave of 14 weeks in Germany and 6 weeks in Great Britain. In Germany, however, it is planned to introduce income-related parental leave payments for up to one year. Time out of the labor market can still cause higher indirect opportunity costs that would only be avoidable through quick returns to the labor market. This however depends on childcare opportunities. In both Great Britain and western Germany there have been initiatives to improve the child care infrastructure. In Britain, even childcare for 3 and 4 year olds had been very poor until the late 1990s, when it was greatly extended. In

Germany, the federal government passed a law, effective from 2005, requiring municipalities to invest in childcare for under 3 year olds. In Britain, low income families have received greatly improved financial support for private childcare costs. However, Evers et al. (2005) expect that the level of support is still not adequate to pay for the high childcare fees in the predominantly private sector childcare market in Britain. In Germany, a certain amount is deductible from taxes. This benefits high income families more than low income families, and the amount of savings is not very high. Especially low income families in West Germany will probably have to wait until the public childcare infrastructure is improved, that is, at least until the target year 2010, to better be able to combine employment and parenthood.

In Germany, high income families profit more from financial support instruments for families, because tax deductions play such an important part. For example, Schratzenstaller (2002) calculates for 2002 that very high income families obtain effective monthly savings of 230€ per child only through the general tax deduction for children, while the corresponding child benefit for low income families amounts to only 154€ per child and month. In Britain on the other hand, transfers have especially concentrated on low income families.

One of the greatest differences between the German and British systems of income redistribution lies in the taxation of married couples. In Germany, married couples where one partner is not working benefit greatly compared to dual-earner couples with equal incomes or singles. Thus, there is an incentive for one partner to stay at home after the birth of a child, especially given the poor childcare infrastructure. After 1990, there is no longer any tax incentive in Britain for one parent to stay at home and take care of the children.

## Chapter 5

### **Differences in the Structure of the Labor Market between Western Germany and Great Britain**

When studying the effects of occupation, income, and type of work arrangement on decisions to have a first child, it is important to take into account differences in the structure of the British and the West German labor markets. Compositional effects can be one cause of fertility differences between the two countries. Differences in the occupational structure may make some occupations more important for understanding fertility patterns in one country than the other. The degree of employment regulation and the type of industrial relations in a country will be relevant for assessing differences in employment security between different types of occupations. With respect to income, it is more likely that one's position in the income distribution will have an effect on fertility decision-making if there is more inequality, if income dispersion is wider. Differences in the nature of part-time work between Great Britain and western Germany will also be important to take account of. Since a high proportion of women in both countries return to part-time work after interrupting employment to care for young children, the quality of part-time work is important in assessing opportunity costs of childbearing. Comparing processes of transition from education to employment can reveal differences in the prerequisites of establishing stable labor market careers, in terms of education, training, and the length of time that is necessary.

#### **5.1 Labor market regulations and labor relations in Great Britain and Germany**

The British and the German labor markets differ with respect to the nature of legal regulations and wage setting institutions. There was a large amount of change in labor market institutions in the 1980s in Great Britain, leading to even greater differences in this respect between the two countries.

In Germany, sector-wide wage negotiations are very influential. There are no national minimum wages, but agreements at industry level are obliging for members of the employers' associations taking part in the negotiations. According to Black et

al. (1999), employer membership rates are around 80%. Legal extension mechanisms to extend wage agreements to firms not directly covered also exist, but are used only to a limited extent. Robson et al. (1999) report that it is however customary to follow wage guidelines set by industry level bargaining, even by firms who are not members. A problem may be though, as suggested by Black et al. (1999), that small firms lack work councils to ascertain that negotiated wage levels are adhered to. In all, Rubery and Fagan (1995) estimate coverage to be around 70%, while the OECD estimate for 1994 is 90% (Black et al. 1999). McGinnity and Hillmert (2004) report coverage by collective bargaining to be 84% for German workers in 1995.

In Britain, employment legislation is generally less restrictive than in Germany to the effect that it more difficult to dismiss workers in Germany (McGinnity and Hillmert 2004). In Great Britain, there have traditionally been few labor market regulations. Even in the pre-Thatcher era, neither unions nor employers were in favor of state involvement. Even at that time, there was practically no protection against dismissal. However, unemployment benefits were still related to previous earnings. In 1981, then, unemployment benefits were reduced to flat rates. These were generally diminished, and eligibility became more restrictive (Hillmert 2001).

Before the 1980s, there had however been a functioning system of wage negotiation in Great Britain. Industry-specific minimum wages were set by Wage Councils. However, as a part of labor market reforms carried out by the Thatcher government, the influence of Wage Councils was weakened in 1986. They were completely abolished in 1993. Minimum wage regulations remained for the agricultural sector only (Robson et al. 1999). A national minimum wage was introduced in 1999. Since the dissolution of industry-wide bargaining, wages are negotiated at firm level only. At the same time, union membership fell from around 75% in the mid-1970s to about 40% in 1990 (Black et al., 1999). Both factors have substantially decreased the influence of unions.

Therefore, one would expect wages to be lower in traditionally unionized industries in Britain than in western Germany. Robson et al. (1999) do find a greater extent of low wages (defined as below 2/3 of the median male hourly wage) in manufacturing industries in Britain (men: 17%, women: 39%) than in western Germany (men: 6%, women 31%). Differences are greater however when differentiating by occupation. Of men employed in unskilled labor occupations, 45% have low wages in

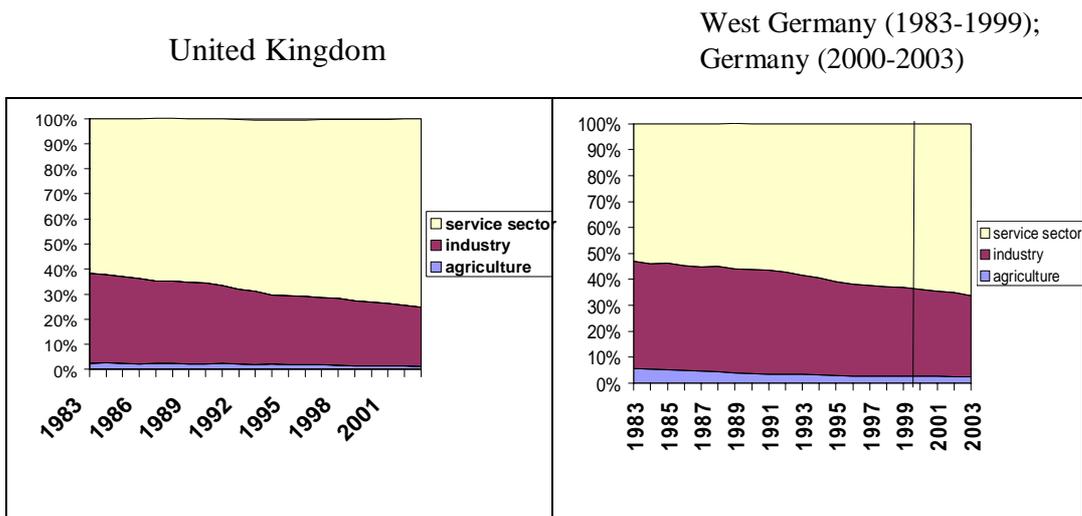
Britain, but only 13% do in western Germany. For women in manufacturing occupations, the rate of low wages is above 50% in both countries.

Industries that are traditionally weakly unionized in both countries are wholesale and retail trade and restaurant and hotel industries. These industries have very high rates of low pay: 42% for men and 63% for women in Britain, and 33% for men and 44% for women in Germany. The prevalence of low wages is also quite high in manufacturing industries for women, but not for men. Low wages are least common in both countries for men as well as women in the finance, insurance, real estate, and business industries. Jobs in these industries are unlikely to be unionized, but are likely to require higher levels of training and work autonomy (Robson et al. 1999).

## **5.2 Industrial restructuring in Great Britain and Germany**

As in most European countries, a relatively strong restructuring of the labor market took place in Britain as well as Germany between 1960 and 2000 (McGinnity and Hillmert 2004). Employment in industry and agriculture declined, while employment in the service sector increased. The reduction in industry jobs and increase in service jobs was greater in Britain, while the decrease in the importance of the agricultural sector was stronger in Germany. This sector, though, makes up only a small percentage of employment in either country. Figure 5.1 below shows the development of employment by sector between 1983 and 2003. No data for western Germany alone was available after 1999, so the data for 2000-2003 refers to both parts of Germany together. Also, this figure shows data for the United Kingdom instead of only for Great Britain. Employment in the agricultural sector started at a higher level in Germany. Industry sector employment made up a greater proportion of total employment in Germany than in Britain each year between 1983 and 2003, with the difference growing larger over time.

**Figure 5.1: employment by sector**



Source: European System of Social Indicators (EUSI), Social Indicators Department, ZUMA, Mannheim (Eurostat, New Cronos, regional data)

The expansion of the service sector is often associated with an expansion of unskilled low wage jobs. However, service sector occupations are very heterogeneous, ranging from professional and managerial occupations to low skill sales and service occupations. The next section will look more closely into the occupational composition of the labor force in Great Britain and western Germany, concentrating especially on gender segregation of occupations.

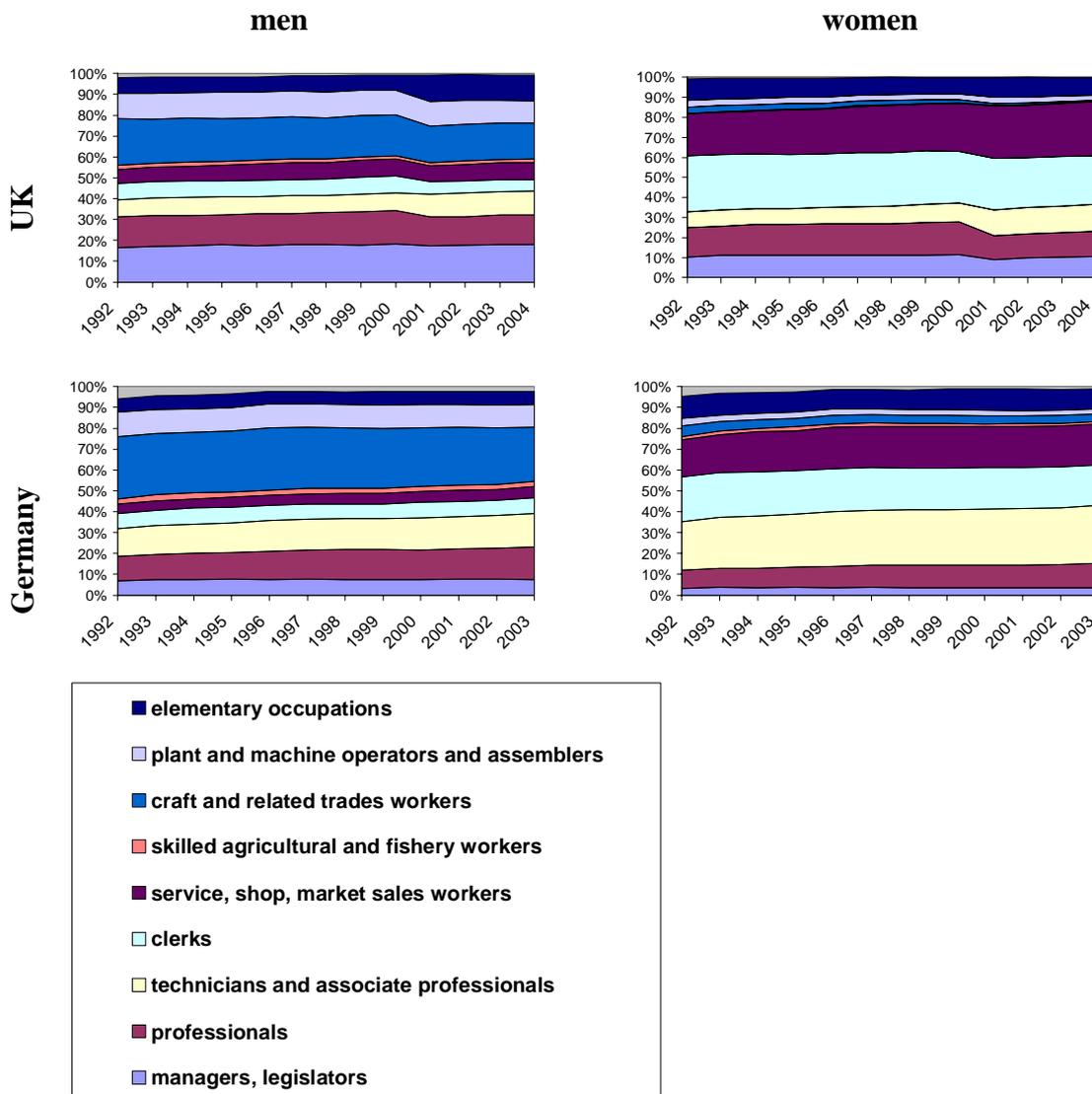
### 5.3 Occupational composition of the labor force and gender segregation

The structure of employment by occupation varies considerably by gender in both the United Kingdom and Germany, as shown in figure 5.2 below. Unfortunately, only data for both parts of Germany together was available. In both countries, men were more likely to be employed in crafts and related trades, or as plant and machine operators or assemblers, or to be managers or legislators, while women were more likely to be clerks and service, shop, market, or sales workers. In Germany, men were also more likely than women to be professionals, but not in the UK, where this type of occupation was just as common for men as for women. In general, the proportion of people employed as professionals, managers or legislators was greater in the UK than in Germany. There were also generally higher proportions of clerks, service, shop,

market, and sales workers in the UK than in Germany. Thus, both high status and low status service jobs seem to be more common in the UK than in Germany. Especially with respect to clerks and professionals, the difference between the UK and Germany was greater for women than for men. In Germany, instead, a relatively large group of women (23.5% -27.5%) were technicians or associate professionals, while this occupational group was considerably smaller in the United Kingdom.

The expansion of the service sector is reflected to some extent in changes in the distribution of occupations across the 1990s. This can best be seen if one follows the fourth group from the top (for agricultural occupations) which in figure 5.2 can be taken to represent a kind of demarcation line between mainly service-related and mainly industrial occupations. (Unfortunately, it is not visible for women in the UK, but is located in the same space, as the fourth group from the top). There was a slight increase across the 1990s in the proportion employed as professionals in both the UK and Germany. In the data for the UK, however, there is a sudden break between 2000 and 2001, which appears to represent an artifact in the EUROSTAT time series. There are also increases in the proportion of technicians and associate professionals, especially among women in Germany. The proportion of women employed as clerks, on the other hand, decreased slightly in both countries while, particularly for women, there was instead an increase in service, shop, and sales employment. Generally, the proportion of craft and related trade workers decreased in both countries. The decline in the proportion of plant and machine operators was somewhat smaller. The percentage of women employed in elementary occupations, which can be either service or industry related, may have declined somewhat, in any case, it did not increase.

**Figure 5.2: employment by occupation**



Source: European System of Social Indicators (EUSI), Social Indicators Department, ZUMA, Mannheim (Eurostat, New Cronos)

Fagan and Rubery (1996) investigate the degree of gender segregation in twelve European countries, including western Germany and the United Kingdom, using EC Labour Force Survey data for 1990 provided by Eurostat. They differentiate between segregation of female full-time workers and female part-time workers. They find that female full-time employees are strongly overrepresented in clerical occupations in both western Germany and the UK, while female part-timers are strongly overrepresented in service jobs. The degree of overrepresentation is greater in both cases in the UK. Female full-timers are also slightly overrepresented in service jobs in western Germany. In the UK however, female full-timers are slightly underrepresented in ser-

vice jobs. Both female full- and part-timers are underrepresented in production and agriculture in Britain, and only in production in Germany (Fagan and Rubery 1996).

Elliot (2005) also finds evidence of high degrees of occupational gender segregation in Britain. Elliot (2005) calculates Theil's H as a multiple group index of occupational segregation between men, women full-timers, and women part-timers in 1990, comparing Britain and the United States, a country to which Great Britain is often assumed to be quite similar in terms of labor market structure. Segregation was found to be higher between women full-timers and part-timers in Britain than in the United States, as was segregation between men and women. In Britain, occupational segregation between male and female full-time workers proved to be much higher than segregation between women full-timers and part-timers.

Black et al. (1999) empirically test Rubery and Fagan's (1995) hypothesis that gender earnings inequality depends on both the degree of gender segregation and the degree of wage protection in a country. An important factor is how comprehensive systems of wage protection are; non-comprehensive systems of wage protection are held to exclude female-dominated jobs. As described above, wage protection is more comprehensive while at the same time occupational gender segregation is lower in western Germany than in Great Britain (Black et al. 1999; Fagan and Rubery 1996). In both countries, women are also more likely than men to work in the public sector and to work part-time, and at least in Britain, also in small firms. All of these types of jobs are more regulated in Germany than in Great Britain (Black et al. 1999).

Black et al. (1999) use 1989 ISSP individual-level data to estimate models for male and female earnings in Great Britain and West Germany<sup>11</sup>. For women, differences in wages between service occupations and other occupations were greater in Britain than in West Germany. This is in line with the hypothesis based on Rubery and Fagan (1995) that more comprehensive German employment regulations and wage agreements reach the female-dominated service sector to a greater extent than in Britain (Rubery and Fagan 1995). Black et al. (1999) also find that not working in male dominated industries had a negative effect on earnings for men in Britain. Working part-time had a negative effect on wages in Britain as well, but not in West Germany. Altogether, it appeared that working in typically female jobs had stronger negative effects in Britain than in West Germany, and more so for women than for men.

---

<sup>11</sup> Their comparison also includes the Netherlands, but here I will only summarize their results for Great Britain and West Germany.

According to Hall (2001), tertiarization in Britain, in contrast to western Germany, mainly took place in the private sector. That is, while service occupations expanded in both countries, in Germany, this was related to a greater extent to an expansion of public sector employment, while in Britain, there was mainly an increase in private sector service jobs. This may further contribute to lower wages in the service sector in Britain than in western Germany. However, the extent of public sector employment may not be that important a factor in explaining differences in the wage differential by occupation between the two countries, because even public sector employment is relatively deregulated in Great Britain (Rubery and Fagan 1995). This is supported by the finding by Black et al. (1999) that working in the public sector has a positive effect on wages for women in West Germany, but not in Britain.

Black et al. (1999) calculated an indicator for the male-female wage differential in both countries. It was composed of an attributes component, accounting for the influence on wages of differences in individual and job characteristics between men and women, as well as a discrimination component, accounting for differences in the male and female coefficient estimates in the wage equations. This measure gave a male-female difference in log hourly earnings of 0.564 for Great Britain, and 0.327 for West Germany. Both the attributes-component and the discrimination-component were larger in Britain than in West Germany. In both countries, the discrimination component was much more important for the total wage differential, it was 0.474 in Great Britain and 0.316 in West Germany<sup>12</sup>. Expressed differently, hourly wages for women were found to be 61% lower in Britain and 37% lower in Germany net of differences in individual or job characteristics (Black et al. 1999). Possibly, occupational differences on a more detailed level would have to be taken account of to explain more of the gender wage gap.

The greater wage differences between service and other jobs in Britain than in Germany may render occupation a more important variable in analyzing fertility patterns in Britain than in Germany. Because of the greater extent of employment in services in Britain, typical fertility patterns for those employed in service jobs will be more important in understanding overall fertility patterns. It may also be interesting to see if the very much higher proportion of female technicians in Germany than in

---

<sup>12</sup> The discrimination component was calculated by subtracting the female from the male estimates of the coefficients in the wage equation. These differences were evaluated at the mean female values of the variables, leading to estimates of wage discrimination of 61% for Britain and 37% for Germany.

Great Britain has an influence on fertility patterns. The higher proportion of men in craft and related occupations in Germany than in Britain, and the higher proportion of female professionals in Britain may lead to further compositional effects. The relatively high level of gender segregation in Great Britain can have negative effects on women's average job quality and earnings (Rubery and Fagan 1995b). On the other hand, social support for mothers can be higher in jobs with higher proportions of female workers (Ranson 1998). It may be interesting to see whether fertility is higher in particularly female-dominated professional occupations such as teaching than in other professional occupations.

## **5.4 Employment characteristics**

### **5.4.1 Temporary employment**

Although the labor market in the United Kingdom is often described as being more flexible, explicitly fixed-term contracts are somewhat more frequent in western Germany. For men in western Germany, they fluctuated between 9% and 11% between 1984 and 1999, and for women they fluctuated between 9% and 13% during this time period. In the UK, the proportion of fixed-term contracts fluctuated between 4% and 6% among male employees, and for women between 7% and 9% across this period (EUSI: EUROSTAT). Temporary employment also appears to be correlated with low pay. Robson et al. (1999) found higher rates of low pay for employees with fixed-term contracts among both men and women in both West Germany and Great Britain. For Britain however, their case numbers were very small.

### **5.4.2 Self-employment**

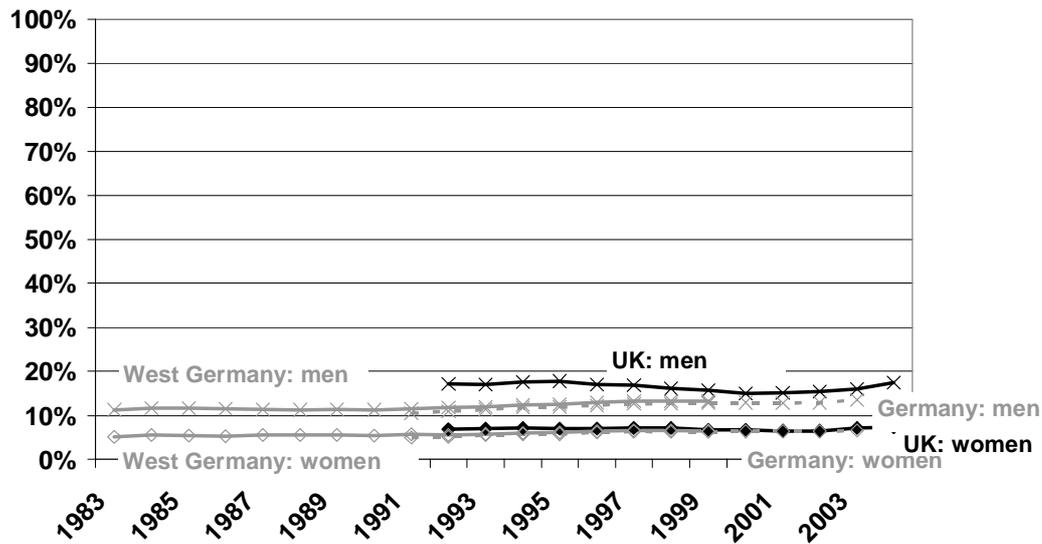
Hillmert (2001) and Scherer (2001) obtain diverging results for the development of self-employment among different population groups in Great Britain. Hillmert (2001) finds increasing rates of reentry into self-employment from non-employment for women aged 25-44 across the early 1990s in Britain. Scherer (2001) finds that self-employment in the early years of labor market participation has decreased between

the labor market entry cohorts 1984-88 and 1989-91 in Britain. With respect to Germany Scherer (2001) finds an increase in early career patterns characterized by self-employment between the two cohorts. Overall levels of self-employment, in any case, have not shown much change across the 1990s (figure 5.3). Self-employment appears to be most common for men in the UK, reaching 17% in the early 1990s and in 2004. Self-employment has remained under 10% across the whole time period for women in both the UK and Germany, thus leading to a greater gender difference in the probability of being self-employed in the UK than in Germany. For the first five years after labor market entry, though, the overrepresentation of men in self-employment is stronger in Germany (Scherer 2001).

Education has a positive effect on having an early career characterized by self-employment in Germany, but in Britain the effect is slightly negative (Scherer 2001). This seems to indicate a different nature of self-employment in the two countries. This may be because access to self-employment is strongly regulated for many professions in Germany, being dependent on formal qualifications. There are actually two pathways to early self-employment in Germany. Those with vocational degrees are more likely to switch from full-time employment to self-employment, while those with high levels of education are more likely to enter self-employment directly (Scherer 2001).

In models of first birth risks, it will be important to keep in mind that correlations between self-employment, education, and earnings may differ in strength and direction between Great Britain and western Germany.

**Figure 5.3: self-employment**



Source: European System of Social Indicators (EUSI), Social Indicators Department, ZUMA, Mannheim (EUROSTAT)

### 5.4.3 Firm size

Black et al. (1999) report that in Britain, women are more likely than men to be employed in small firms. Small firms, however, are unlikely to be unionized. Especially after the abolishment of industry-wide agreements, wages will tend to be lower here. Black et al. (1999) find support for this using data for 1989. For women in Britain, firm size has a significant positive effect on wages. For men, there is no significant effect, and they have no variable for firm size for West Germany.

Robson et al. (1999) find a negative relationship between firm size and rates of low pay in both countries for both men and women. However, the effect is not as clear for men in western Germany as for the other three groups. For West German men, higher rates of low pay are only found in very small firms with 1-19 employees. In contrast to the finding by Black et al. (1999), they do however find an effect of firm size on the rate of low pay for men in Britain.

#### **5.4.4 Public vs. private sector employment**

Because public sector pay is less regulated in Britain than in Germany, it can vary regionally to a greater degree than in Germany. Many public sector services in Britain have also been contracted out or privatized (Black et al. 1999). This is likely to have led to an income decline for employees. Working in the public sector had a positive effect on wages for women in Germany, but not in Britain (Black et al. 1999).

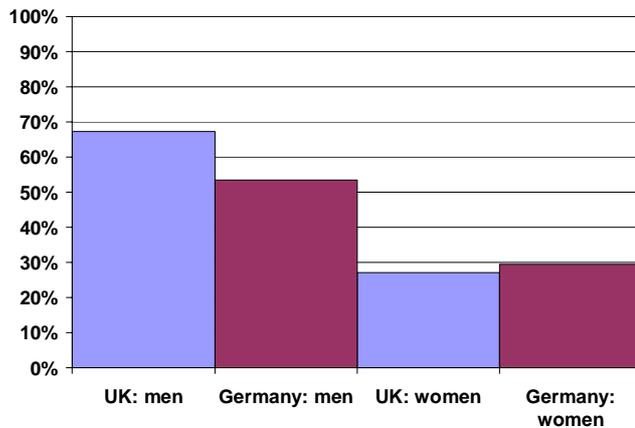
On the other hand, Robson et al. (1999) find differences between the public and the private sector in both countries with respect to the probability of receiving low pay. For women, they find higher rates of low pay in the private sector than in the public sector in Great Britain as well as Germany. The finding is the same for men in Britain, but not in Germany. For men in Germany, rates of low pay appear to be unaffected by sector of employment. The probability of receiving low wages is especially high for women working part-time in the private sector. Of this group, in Germany, 48% and in Britain 66% have wages below 2/3 of the median male hourly wage.

#### **5.4.5 Long hours**

The prevalence of long hours appears to be greatest among men in the United Kingdom (figure 5.4). In the year 2000, 67% of employed men in the UK regularly worked more than 40 hours a week. This figure was somewhat lower in Germany, at 54%. The percentages of women working over 40 hours were quite similar in the two countries, at slightly under 30%. The lower rates for women may be related to higher levels of part-time work. Among women working full-time, the percentage working long hours should be higher. It will be important to examine more closely in which occupations people tend to work long hours, and whether long hours are associated with higher levels of income in the two countries.

**figure 5.4: Long hours in 2000**

**Percentage of persons in employment working more than 40 hours a week**



Source: European System of Social Indicators (EUSI), Social Indicators Department, ZUMA, Mannheim (source: ILO)

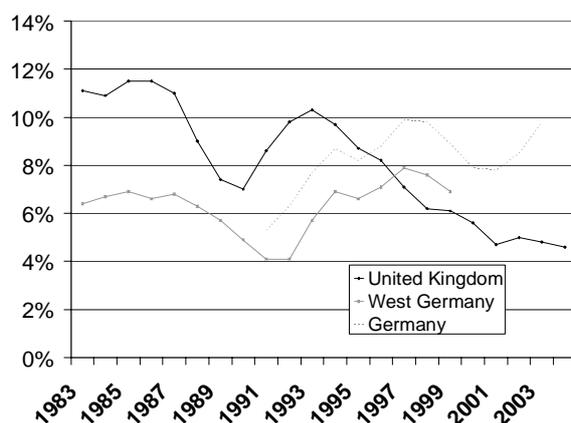
## 5.5 Unemployment

Periods of high unemployment can imply labor market insecurity for large groups of the population. Fluctuations in levels of unemployment may therefore lead to period effects in first birth risks. Unemployment at labor market entry can lead to delays in decisions to have a first child, and thus it will be important to take into account differences in this respect between Great Britain and western Germany.

Unemployment was quite low across the 1960s and early 1970s in both countries, especially in West Germany (under 2%). It started to grow in both countries in the mid 1970s, and by the early 1980s was much higher in Britain (about 12%) than in West Germany (about 8%) (Hillmert 2001). Figure 5.5 shows the development of unemployment between 1983 and 2003 in Germany and the UK. Unemployment rates decreased across the 1980s, reaching low rates in the early 1990s of about 7% in the UK and 4% in western Germany. Subsequently, there was a hump in unemployment rates in the UK followed by a long-term decrease, while unemployment continued to increase in western Germany. As a result, the unemployment rate was higher in western Germany, at 6.9%, than in the UK at 6.1% in 1999. Separate time series for western Germany were only available up to 1999 (figure 5.5: EUSI; Hillmert 2001).

At the beginning of the study period of the 1990s then, the difference in unemployment rates between the two countries was quite large, but then converged in the second half of the 1990s.

**Figure 5.5: unemployment rates in the United Kingdom and Germany**



Source: European System of Social Indicators (EUSI), Social Indicators Department, ZUMA, Mannheim (Eurostat, New Cronos)

These developments also become evident when looking at unemployment from a cohort perspective. Between birth cohorts 1950 and 1960, unemployment has increased considerably in both Great Britain and Germany (Hillmert 2002). Subsequently, as shown by Scherer (2001), unemployment in the first five years after labor market entry has increased further in Great Britain, but not in Germany. Applying cluster analysis to find patterns of divergence from the standard full-time trajectory, Scherer (2001) finds an increase in unemployment between the labor market entry cohorts 1984-1988 and 1989-1991 in Britain. This does not entirely reflect overall developments of unemployment, and seems to indicate that labor market entry has become more difficult, even when overall levels of unemployment have decreased.

Scherer (2001) generally finds a greater prevalence of unemployment during the first five years after labor market entry in Great Britain compared to Germany. Especially, a cluster characterized by predominant long-term unemployment was more common in Great Britain than in Germany. However, as mentioned above, Scherer (2001) finds an increase in unemployment across labor market entry cohorts in Britain. The degree of unemployment was lower for the older cohort. Therefore, I

am not completely convinced by the conclusion that it is differences in the vocational training systems that lead to more initial labor market insecurity in Great Britain. The corresponding hypothesis had been that screening processes in Britain are more extensive because vocational qualifications are less standardized (Scherer, 2001). Instead, perhaps the more irregular early employment careers in Great Britain are caused to a greater extent by the recent deregulation and restructuring of the British labor market.

Scherer (2001) finds that while the proportion of people in the unemployment clusters in Great Britain increased, in Germany, by contrast, there was even a relatively strong decrease in the proportion belonging to the short-term unemployment cluster, between the labor market entry cohorts 1984-1988 and 1989-1991. A further indicator that labor market entry has become more difficult and irregular in Britain was that part-time employment increased, especially for men, between these entry cohorts.

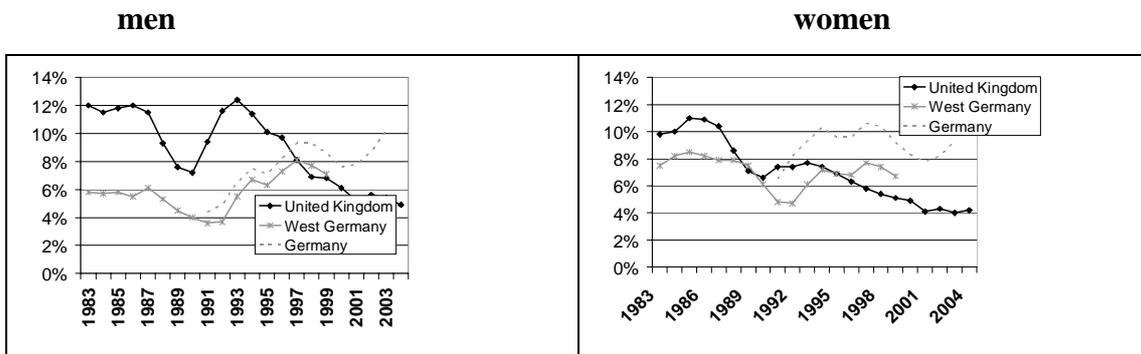
McGinnity and Hillmert (2004) also find higher risks of unemployment at early ages in Britain than in Germany, and also find that unemployment risks have grown across cohorts, particularly in Britain. They compare 1950, 1955, 1960, 1964, and 1971 birth cohorts for Great Britain and West Germany, using the BHPS for Britain, and the German Life History Study for West Germany. Their analysis is restricted to men in their early years of labor market experience.

Figure 5.6 shows the development of unemployment rates separately for men and women. It appears that unemployment rates are generally higher for men in Britain and respond more strongly to economic fluctuations. A reason for this could be, though, that women with low labor market prospects leave the labor market completely and thus do not show up in the unemployment statistics. In western Germany, by contrast, until 1996, unemployment rates are higher for women than for men, whereafter the relationship reverses, leaving women with slightly lower unemployment rates.

Scherer (2001) finds that in both countries, men were more likely to have early employment careers characterized by short-term unemployment. In Germany, however, women were strongly overrepresented in the group characterized by long-term unemployment. According to Hillmert (2001) unemployment risks started increasing for men in Britain in the late 1970s. Growths in unemployment risks were particularly strong across the early 1990s. Job-to-job transition rates also increased between the early 1980s and mid 1990s. In the mid 1980s, job-to-job, job-to-unemployment, as

well as job-to-non-employment transition rates also started to increase for women. Job-to-job, as well as job-to-non-employment mobility was found to be higher for women than for men, while unemployment risks were higher for men. For men, the median duration of unemployment increased across the 1980s, and then started to decrease again in the 1990s. For women, durations in non-employment also decreased in the 1990s.

**Figure 5.6: unemployment rates in the United Kingdom and Germany**



Source: European System of Social Indicators (EUSI), Social Indicators Department, ZUMA, Mannheim (Eurostat, New Cronos)

Looking at the relationship between qualification and unemployment, Scherer (2001) finds that people with high levels of education or any kind of vocational training are much less likely to have early careers characterized by unemployment in either country. Conversely, stable full-time employment is more likely for those with high education or vocational training, especially in Britain. With respect to occupational class, Hillmert (2001) found that the risk of unemployment in Britain was higher for men in unskilled occupations than for those in higher class occupations. This effect increased in the 1980s, and then decreased again towards the end of the 1980s, and was no longer significant in the early 1990s. McGinnity and Hillmert (2004) find greater disadvantages for unskilled as compared to skilled young male manual workers with respect to avoiding unemployment in Germany than in Great Britain.

To summarize, men's unemployment rates diverged more strongly than women's between West Germany and the UK during the early to mid 1990s. Especially unemployment in the early career seems to have become more frequent for men in Britain. Higher levels of education and training, as well as belonging to a higher

occupational class, appear to be important for avoiding unemployment in both countries. Being unskilled appears to have an especially marginalizing effect for men in Germany. However, it is not so clear how these effects have developed throughout the 1990s.

## **5.6 Transitions from education to employment**

When studying first birth decisions, it is important to understand what factors make successful and swift transitions from education to employment possible. Differences in the organization of education and vocational training can lead to diverging patterns of labor market entry. If it generally takes people with the same level of education longer to establish a stable career in one country than the other, this may lead to different effects of education on the timing of first births. Differences in labor market outcomes by level of education in terms of earnings and occupational class will also need to be taken account of when using these three variables, that is, education, occupation, and earnings, as independent variables in models of transitions to first birth.

### **5.6.1 Differences in the education and training systems**

Patterns of transition from education to employment are commonly expected to be smoother in western Germany than in Great Britain (Scherer 2001). In western Germany, people stay within the education system until relatively high ages (see also Hillmert 2002). One reason for this is that educational credentials are so important for finding employment. Vocational degrees are highly standardized and can give employers reasonably good information about how well a person is qualified for a given job. Because of the importance of type of vocational degree for allocating employees to jobs, the West German labor market is often referred to as a segmented labor market, implying that there is little inter-occupational mobility. However, mobility between different employers within the same occupation is taken to be more easily possible. In Great Britain, where according to much of the literature, on-the-job training is more important relative to vocational training than in western Germany, employer changes are more difficult. It is more difficult for new employers to assess which

qualifications prospective employees have previously acquired. Skills may often be less broadly applicable, but instead quite firm-specific. Employers will also be more unwilling to let their employees go after spending more resources training them than is the case in western Germany, where training takes place to a greater degree in the educational system. Therefore, the expectation is that internal labor markets play a more important role in Great Britain, with employer tenure as well as intra-firm job mobility being higher than in western Germany. Because formal vocational training is not as lengthy in Great Britain, people will also tend to enter the labor market at younger ages. The hypothesis is often, though, that labor market entrants in Britain experience more instability in their first years in the labor market, because employers need more time to screen their new employees, about whom they could gain only limited information from their educational credentials. By contrast, due to the dual system of vocational education, employers in western Germany can screen potential employees while they are formally still in education (Scherer 2001). Many apprentices in western Germany are actually retained in the firm in which they did their apprenticeship (McGinnity and Hillmert 2004). According to Hillmert (2002), extensive investments into employees' broader qualifications, beyond what is immediately necessary for their present tasks, are unlikely in Britain, because firms in Britain tend to work with a shorter planning horizon. They may also fear that the employees they have invested so much in will switch to other higher-paying employers. In western Germany, by contrast, this is unlikely to happen, because of sector-wide wage agreements.

A frequent expectation is that the level of education is more important for labor market outcomes in western Germany than in Great Britain (Scherer 2001). In western Germany, people are trained for specific types of jobs, while in Britain, eventual outcomes are more open at labor market entry.

In Great Britain, a relatively large proportion of the population has no formal qualifications (McGinnity and Hillmert 2004). These are sometimes acquired later on a part-time basis (Hillmert 2002). In western Germany, by contrast, those without formal vocational degrees make up a small minority that is likely to be marginalized in the labor market (McGinnity and Hillmert 2004).

### 5.6.2 Importance of education for labor market entry and job outcomes

Hillmert (2002) studies the dispersion of age at entry into the first job lasting at least 24 months in western Germany and Great Britain. He finds that age dispersion, measured as the distance between entry age quartiles, had initially been much higher in western Germany than in Great Britain, in birth cohorts 1930, 1940, and 1950. This is likely to be due to the more differentiated education and training system in western Germany. For birth cohort 1960, however, in Britain, age dispersion had increased greatly as compared to birth cohort 1950. This is likely to be caused by educational expansion. But also, since Hillmert (2002) is studying entry into the first stable job, and not labor market entry in general, this finding could also be explained by increasing job instability in the early career in Britain (Hillmert 2002).

Scherer (2001) applies sequence analysis to BHPS and SOEP data for the years 1985 to 1996. Two labor market entry cohorts are included in the study: those who entered the labor market between 1984 and 1988 and those who entered between 1989 and 1991. The first five years of labor market experience after finally leaving education are studied.

The largest groups of people in both countries have standard full-time trajectories across the entire first five years after labor market entry. In western Germany, 34%, and in Britain, 33% of labor market entrants belong to this group. However, in Germany, experiences for men and women are very different. Of male labor market entrants, 41% have a continuous full-time career, while of female labor market entrants, only 25% have continuous full-time careers. In Britain, the picture diverges between cohorts. In the older entry cohort, gender differences are very small. In the younger cohort however, women's early labor market careers appear to have become more instable. Instead of 36% having stable full-time careers like in the older cohort, only 24% do in the younger cohort. For men, the change was much smaller, from 34% to 31% (Scherer 2001).

Scherer (2001) uses Optimal Matching Analysis to determine how much individual labor market trajectories diverge from a standard trajectory of continuous full-time employment. Regression analysis for the effect of education on the measured distance to the standard pattern of continuous full-time employment is then conducted.

Vocational training, at most levels, turned out to be more important for having a stable career than the level of general education. In Britain, women with compulsory

general education diverged most strongly from the standard full-time career. British men with general upper secondary degrees but no vocational training were about equally far from the standard full-time trajectory as those with only compulsory general education. In western Germany, for both sexes, having an upper secondary degree (Abitur) but no vocational training led to the highest distance to continuous full-time employment. This effect was much stronger than in Britain. A few groups with vocational degrees, however, also diverged relatively strongly from continuous full-time employment. These were those with very low vocational degrees in Britain and those with very high vocational degrees in western Germany (Scherer 2001).

The difference between those with apprenticeship training and those with only general upper secondary degrees (Abitur) seems to support the idea that vocational training is especially important in western Germany. Vocational training also seems to be important in Great Britain, but effects are not as strong. By contrast, university education results in comparatively more stable early careers in Great Britain than in western Germany. (Scherer 2001). Tertiary education in Britain is often described as being more general in nature than in western Germany. This would further support the idea that in Britain, it is the level of education, not specific vocational skills, that is important. It is interesting that having a university degree in western Germany, which is usually relatively vocationally oriented, does not give as much of an advantage as an apprenticeship in achieving stable early careers.

Hillmert (2002) studies employer tenure, as well as tenure within a specific occupation, and duration within a specific social class. Hillmert (2002) finds stronger effects of qualification on entry job durations in western Germany than in Britain. However, it does not become entirely clear in Hillmert (2002) whether the effect of qualification that is referred to includes the effect university degrees as opposed to lower-level degrees, or especially reflects the effect of vocational degrees as opposed to no degrees. If it only refers to the effect of vocational degrees, that would be in line with the finding by Scherer (2001), who also finds a greater effect of vocational education in western Germany than in Britain.

In any case, people with university degrees in western Germany do seem to benefit in terms of earnings. According to Black et al. (1999), having a university degree had a significant positive effect on wages for women in western Germany, while educational differences at lower levels did not make that much of a difference. In Britain, educational differences were important for earnings at all levels. For German

men, level of education was more important for earnings at most levels than was the case for women. In Britain, only university degrees were more important for men than for women.

Hillmert (2002) shows that while university degrees are important both in western Germany and in Britain for acquiring a professional, managerial, administrative, or higher-level technical job (i.e. a service-class job according to the Erikson-Goldthorpe scale), the effect is a lot stronger in western Germany. However, the advantage of a university degree for acquiring a service class (professional, managerial, etc.) job as a very first entry job has declined across cohorts in western Germany, while it has remained very high for acquiring a service class job as a first long-term job. Apparently, it has become less likely for people with a university education to enter a service class job immediately. In western Germany, vocational training turned out to be extremely important for entering skilled manual work, whether as a first job or a first long-term job (Hillmert 2002).

Because the unskilled are a very small marginal group in western Germany, and because the German labor market is so strongly oriented towards formal qualifications, McGinnity and Hillmert (2004) hypothesize that the risk of unemployment relative to other classes is greater for the unskilled in western Germany than in Britain. For western Germany, they expect there to be greater differences between the skilled and unskilled than between manual workers and professionals or managers. Their results, pertaining to their analysis of men's early unemployment risks, confirm these expectations: in western Germany, differences in the risk of unemployment are larger than in Britain between, on the one hand, a group composed of semi- and unskilled manual and unskilled non-manual workers, and on the other hand the group of skilled manual workers. By contrast, in Britain, the difference in the risk of unemployment between the two highest class groups is much greater than in western Germany. These are the professionals, administrators, managers, and higher grade technicians, as compared to routine non-manual workers and lower grade technicians and supervisors.

Thus, unskilled young men seem to be more at a disadvantage in terms of the risk of unemployment in western Germany than in Britain. However, the results by Scherer (2001) relating to the stability of early careers, (summarized above) indicate that unskilled women are more disadvantaged in Britain than in western Germany in terms of being able to sustain a stable full-time career across the first five years of

employment. Not differentiating for skill levels, generally, predominant unemployment across the first five years of labor market experience was more common among West German women in the older cohort, and for British women increased to similar levels in the younger cohort.

### **5.6.3 Job duration and occupational mobility**

Hillmert (2002) finds that median first job duration has been higher in Great Britain than in western Germany for birth cohorts 1930 – 1960. This could be due to greater firm attachment in Britain than in western Germany, resulting from more firm-specific skills. When there is a job change, however, it is more common in Britain to also change ones occupation than in western Germany. This supports the presumption that the labor market is more occupationally segmented in western Germany than in Britain (Hillmert 2002).

For the first job, starting at a relatively high duration of about 8 years for birth cohort 1930, occupational tenure has steadily decreased across cohorts in Britain. For birth cohort 1960, then, durations in the same occupation were very similar in Britain and western Germany. Median job duration, by contrast, has decreased in both countries and was thus still shorter in western Germany for cohort 1960. Thus, even though first job durations became shorter in western Germany, the amount of time that people stayed in the same occupation did not change (Hillmert 2002).

Hillmert (2002) also presents results for birth cohort 1970 for Britain, but does not have data for western Germany. For birth cohort 1970 in Britain, job duration again decreased strongly, to a median duration of less than 2 years for the first job. This is similar to the value for the 1960 cohort in Germany, but it is not known whether and by how much first job durations have decreased for the 1970 cohort in western Germany. In any case, first job durations seem to have become very short in both countries.

Hall (2001) finds greater effects of education and training on upward and downward occupational mobility in western Germany than in Great Britain. This seems to provide evidence for the assumption that formal vocational degrees are of greater importance for labor market outcomes in western Germany than in Great Brit-

ain. Generally, Hall (2001) finds more occupational upward and downward mobility in Britain than in western Germany for both men and women.

Hall (2001), studying career trajectories up to the age of 35, finds that more women and men in Britain than in western Germany ever were in unskilled manual and non-manual occupations, but they were less likely to remain in these positions during the whole study period. In both countries, more women than men were in these positions. Less women in Britain were in service class (professional, managerial, etc.) occupations than in Germany, and they were also less likely to be in these positions during the entire study period. While in Germany, the percentages of men and women in service class (professional, managerial, etc.) positions were approximately equal, and women were even more likely than men to be in these positions during the whole period, in Britain, less women than men were in these positions, and also were less likely to have these positions during the whole time. This differs from the cross-sectional picture given in figure 5.2. From a cross-sectional perspective, during the 1990s, more women in Britain than in Germany had professional or managerial occupations. The reason may be that Hall (2001) only observes people until they are 35. After this age, the two countries may compare differently. Also, the observation period is not the same. The employment trajectories studied by Hall (2001) are mainly located before the 1990s. In addition, Hall (2001) looks at two very particular measures: ever having been in a specific occupation, and having held that occupation during the whole observation period. These measures are likely to produce results that are not well comparable to cross-sectional results.

Looking at skilled manual and non-manual occupations, Hall (2001) finds that men were more likely to ever have these occupations than women in western Germany, while in Britain percentages for men and women were approximately equal. People in western Germany were more likely to remain in these occupations for the whole period, with little gender differences (Hall 2001).

According to Black et al. (1999), work experience has a stronger positive effect on wages for women in Britain than in western Germany. The effect for women in Britain is also stronger than that for British men.

Hall (2001) finds that in both countries, women were more likely to experience downward mobility than men. This effect was stronger in Britain, while for men as well, risks of downward mobility were greater than in Germany. Women were also less likely to experience upward mobility. The gender effect on upward mobility in

both countries could partly be explained by controlling for an interaction between gender and marital status. In both countries, for women there is a negative effect of being married on upward mobility, while for men there is a positive effect. However, the lower odds of upward mobility for women could not entirely be explained in either country (Hall 2002).

#### **5.6.4 Transitions from education to employment: summary**

To summarize, vocational training is important for a smooth transition from education to employment in both Great Britain and western Germany, but the effect is especially strong for men in western Germany. In Britain, the stability of entry careers has declined for women. Women with only compulsory education seem to have particularly low labor market chances in Britain. For acquiring a skilled job, having a vocational degree is more important in western Germany than in Great Britain. The proportion without vocational training is much smaller in western Germany than in Great Britain. University degrees do not seem to guarantee stable entry careers in western Germany. However, they are more important in western Germany than in Britain for eventually acquiring a service class (professional, managerial, etc.) job. In both countries, having a university degree has positive effects on earnings. Although employer tenure of entry jobs continuously declined across cohorts in Britain, people still stayed with their first employer for longer than in western Germany at least until birth cohort 1960. Occupational tenure for first jobs had also been higher in Britain than in western Germany, but declined along with employer tenure and became more similar to West German levels. When not looking exclusively at entry jobs, there is generally more occupational mobility in Britain than in western Germany. Educational degrees are more important determinants of vertical mobility in western Germany than in Britain. In both countries, women experience more downward and less upward mobility than men.

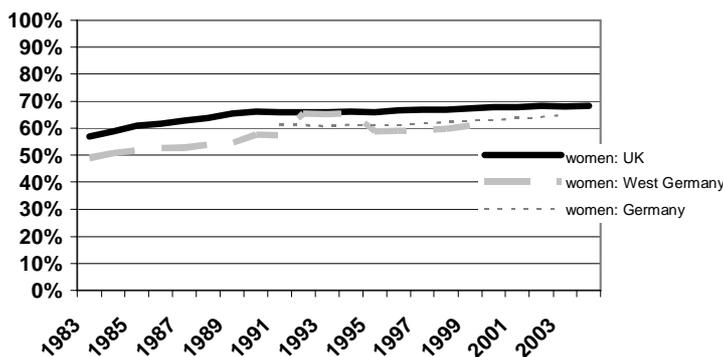
## 5.7 Women's labor force participation and part-time work

### 5.7.1 General development of labor force participation and part-time work

The overall level of female labor force participation has been somewhat higher in the 1980s and 1990s in the United Kingdom than in western Germany, as can be seen in figure 5.7. The proportion of employed women working part-time increased in Germany in the 1970s and again somewhat in the 1990s (Hall 2001; see also figure 5.9). Not all of the growth in part-time work has however contributed to a growth in overall female employment. Instead, part-time employment has partially substituted for full-time employment. Geisler and Kreyenfeld (2005) find evidence for this studying mothers of dependent children. Hall (2001) reports a similar development for married women.

The proportion of women working part-time has consistently been higher in the United Kingdom than in Germany (figure 5.9). Although here, too, part-time work has partially substituted for full-time work, the overall female employment rate has risen more strongly since the 1970s than in Germany (Hall 2001).

**Figure 5.7: women's labor force participation**

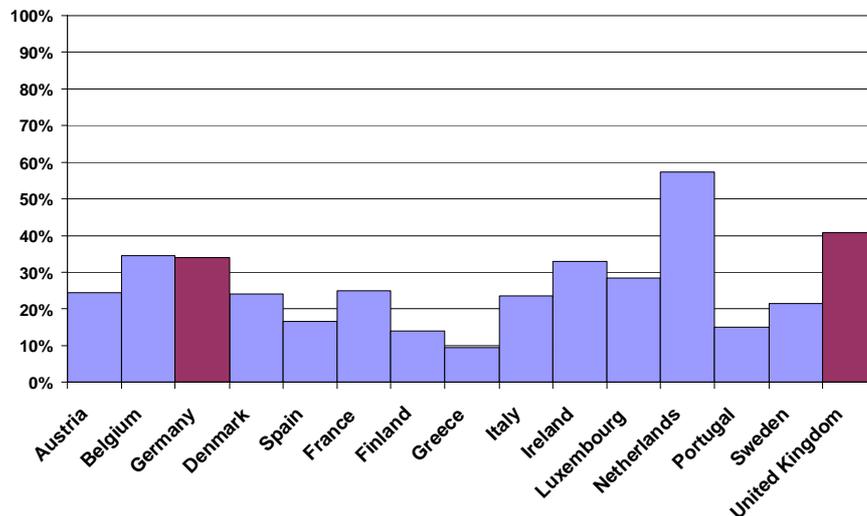


Source: European System of Social Indicators (EUSI), Social Indicators Department, ZUMA, Mannheim (Eurostat, New Cronos)

Germany and the United Kingdom are among the countries with the highest female part-time rates in Europe (Rubery and Fagan 1996). This can also be seen in

figure 5.8, which shows female part-time employment rates in different European countries for the year 2000. Only the Netherlands and Belgium have higher levels of female part-time employment.

**Figure 5.8: female part-time employment in Europe in 2000**

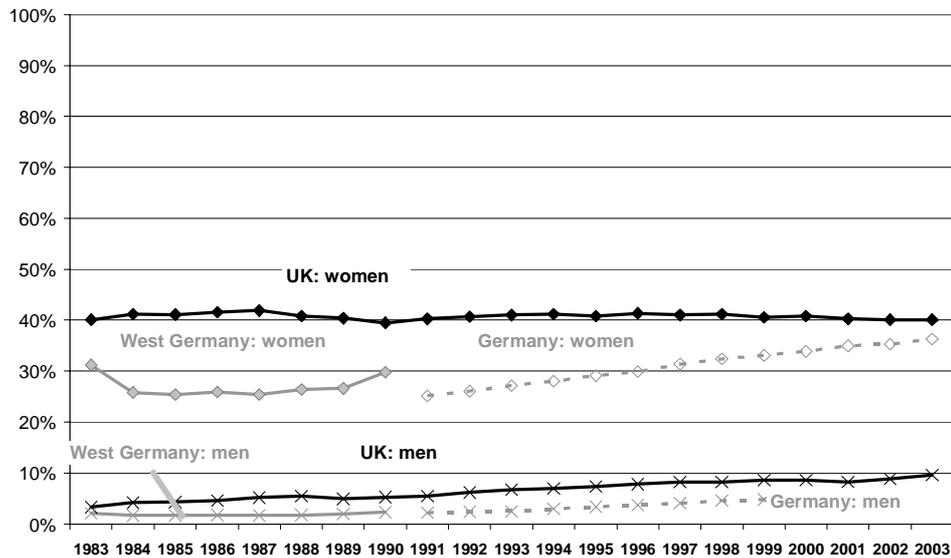


Source: European System of Social Indicators (EUSI), Social Indicators Department, ZUMA, Mannheim (OECD Labour Force Statistics)

Patterns of part-time employment seem to diverge between West Germany and Great Britain in the early phases of the career. Scherer (2001) finds that in West Germany, the first five years after entering the labor market are more likely to be dominated by part-time work for women than for men. In Britain, instead, men are even slightly more likely to have early careers dominated by part-time work than women. A reason for this difference between West Germany and Great Britain could be that women in Germany, because they generally leave the educational system at later ages than in Britain, may be more likely to already have children and work part-time during the first five years after entering the labor market. In any case, it seems to indicate that in Britain men are more vulnerable to instable early careers in the form of long phases of part-time work than are German men. Slightly higher general rates of part-time employment for men in Britain can also be seen in figure 5.9.

Thus, among non-standard types of employment, for men as well as women, part-time employment appears to be more common in Great Britain, while, as seen above, temporary employment seems to occur more frequently in western Germany.

**Figure 5.9: part-time employment**



Source: European System of Social Indicators (EUSI), Social Indicators Department, ZUMA, Mannheim (OECD Labour Force Statistics)

### 5.7.2 Characteristics of part-time work

In both Germany and the UK, women employed part-time are more concentrated in a limited number of occupations, especially service occupations, than are female full-time employees. However, the difference in degree of sex-segregation between full-time and part-time employees is greater in the UK than in Germany (Rubery and Fagan 1996).

This may be one factor causing lower wages for female part-time employees, especially in Britain. Defining low wages as hourly wages below two thirds of the median male hourly wage, Robson et al. (1999) find that more part-time employed than full-time employed women earn low wages, both in West Germany and in Great Britain. The difference in the rate of low pay between part-time and full-time employed women is greater in Britain (55% compared to 32%) than in West Germany (38% compared to 30%). As mentioned above, Black et al. (1999) also find a negative effect of part-time work on wages for Britain, but find no significant effect for West Germany.

The limit below which employers are freed from paying social benefits has been higher in Britain than in Germany, and the percentage of female employees without social insurance was accordingly found to be substantially higher in Britain than in Germany (Hall 2001).

Employee characteristics also seem to have an influence on the probability of being employed part-time. Early part-time work is much more frequent among those with no vocational training in Britain, which may again point to differences in the nature of part-time work between the two countries (Scherer 2001). Part-time employment of mothers, expressed as a percentage of all mothers, however increases slightly with level of education, as does full-time employment, though in the case of the latter, the increase is much stronger (Fagan and Rubery 1996). In Germany, education is also positively related to both part-time and full-time employment of mothers (Fagan and Rubery 1996; Geisler and Kreyenfeld 2005).

To summarize, part-time employment appears to be more marginalized in Britain than in western Germany. Part-time work is more restricted to service occupations and the negative effect of part-time work on wages is stronger. People employed part-time in Britain are more likely to be without social insurance, and among labor market entrants, part-time employment is found most often among those without vocational training.

These differences in the nature of part-time work between western Germany and Great Britain imply differences in opportunity costs of switching to part-time work after having a first child. As will be outlined in the next section, part-time work is a very frequent mode of labor market reentry both in Great Britain and in western Germany.

### **5.7.3 Reentry patterns**

Motherhood has a stronger effect on the probability of working part-time in Germany and the United Kingdom than in most other European countries (Fagan and Rubery 1996). In the UK, women return to the labor market faster than in western Germany, though likewise most often on a part-time basis. In western Germany, it is very common for women to take parental leave for three years, with many remaining outside the labor market for even longer. Geisler and Kreyenfeld (2005) report a non-

employment rate of 71% for West German mothers of children aged 0-3 in 2002. In both Great Britain and western Germany, part-time and full-time employment rates increase steadily with the age of the youngest child. When the youngest child is over 10 however, part-time employment starts to decrease in Britain, while full-time employment continues to rise. In Germany at this stage, there is not yet a decline in part-time employment (Geisler and Kreyenfeld 2005; Twomey 2002).

Gustafsson et al. (1996), using data for the 1980s and early 1990s, find that a high proportion of West German mothers still work up to 3 months before birth, while British mothers tend to leave work earlier. Three months after the birth of the first child, only about 5% of both British and West German women had returned to the labor market. At 6 and 9 months after first birth, more British women (15% and 24%) than German women (6% and 14%) had returned. The proportion of returners then converges at 15 months after first birth to 32% for West Germany and 31% for Great Britain. Finally, at 3 years after the birth of the first child, more West German women than British women had returned: 55% vs. 47%. Thus, it seems that while British women were quicker to return when they did return, West German women were in the end somewhat more likely to return. The authors did not censor the spells at 2<sup>nd</sup> birth, so that the results may be affected by differences in probability and timing of subsequent births. The authors attribute the fact that British women are at first quicker to return to shorter periods of maternity leave in Britain. For higher order births, more British women return to the labor market than for first birth, while this is the other way around for Germany. Mothers of a 2<sup>nd</sup> or 3<sup>rd</sup> child are more likely to have returned to the labor market 3 years after the birth of the child in Britain than in West Germany. In hazard models for reentering employment, the authors find a positive effect of education, and a negative effect of the husband's income on the hazard of labor market reentry in West Germany. They also include an interaction effect of age and work experience, and find that for West Germany, at mean work experience, age has a negative effect, and at mean age at birth work experience has a positive effect on returning. For Great Britain, work experience had a positive effect on return hazard, however, the effect declines with age.

Bender, Kohlmann and Lang (2003) study return hazards to employment for West German women. They use register data, and thus have a very large sample size. The sample includes 1% of the German population who were employed for at least one day between 1975 and 1995 and contributed to the pension system. This excludes

civil servants and the self-employed. The authors analyze hazards of return to employment for women who were employed 2 months before the birth of the first child. Episodes are censored at 2<sup>nd</sup> birth. They find the lowest return propensities for women with vocational training, as opposed to university training or no training. Women who were employed at time of conception have higher return hazards, and those who have spent a higher proportion of their time in the labor market also have higher return hazards. Being a non-manual worker before the birth of the child also increases the return propensity, compared to manual workers. There seems to be a sort of bell-shaped effect of birth cohort. Those born between 1955 and 1965 seem to have the highest return propensities, while those born earlier, between 1935 and 1955, and those born later, between 1965 and 1970 have lower hazards of returning. The effect of calendar time seems to be generally negative, with slight increases again between 1985 and 1995. The authors report a U-shaped effect of wages: women with very low wages and those with very high wages have higher return propensities. However, I do not see this so clearly from their graph. The middle part does seem to be relatively U-shaped, but the extremely high wage groups again have higher return hazards, and those with extremely low wages have lower return hazards. Return hazards are strongly duration dependent. They increase especially strongly when the child reaches the age of 10, but there are some peaks earlier, most probably reflecting the ends of leave periods.

The quicker labor force reentry of British mothers may have to do with differences in the tax system. The system of tax-splitting for married couples in Germany strongly decreases the advantage of having one and a half incomes as compared to just one income. Because incomes are taxed separately in Britain, working part-time does pay off for British women in terms of improving the household income (Hall 2001).

Even in the early career, more women in western Germany than in Britain are predominantly occupied with family care and are thus not working (Scherer 2001). In Britain, there are strong effects of level of vocational training and education on the probability of having long phases of family care. Those with lower levels of education or without vocational training are much more likely to be out of the labor market to care for their families. These effects are much weaker in western Germany. This could indicate that taking large amounts of time out of the labor market is a more widespread phenomenon in western Germany which is not just confined to groups with low chances in the labor market. Differences in age at labor market entry between

Germany and Great Britain may however also have led to some discrepancies in the family-formation stage of those in the sample. There were moderate decreases in the predominance of family care between the labor market entry cohorts 1984-1988 and 1989- 1991 in both countries (Scherer 2001).

With respect to reentering the labor force on a part-time basis, Great Britain is more similar to Germany than to the United States, to which it is often compared in terms of welfare state characteristics and labor market structure. Elliot (2005) finds higher levels of part-time employment and lower levels of full-time employment throughout much of women's life courses in Britain than in the United States. While in the United States in 1990, starting at an age of about 24, women's full-time employment remained relatively constant at a level of about 55% up until an age of about 50, in Britain women's rate of full-time employment had its peak of also approximately 55% at an early age of 22. It started declining strongly at ages 25-26, and has a low of about 33% in the early 30s, and only recovers to about 38% in the mid-40s. By contrast, levels of part-time employment increase greatly after about age 25, with as much as 35% of women working part-time in their mid-40s.

There has been an increase over time in the rate of reentry into part-time employment instead of full-time employment in both Germany and Great Britain. Women's risks of transition from non-employment to part-time employment have increased over time in relation to transitions into full-time employment in Britain. By the mid 1990s, reentry rates into part-time employment were higher than reentry rates into full-time employment (Hillmert 2001). Geisler and Kreyenfeld (2005) find an increase between 1991 and 2002 in the proportion of mothers working part-time or very short hours, and a decrease in the proportion working full-time in western Germany. There may also be an increasing tendency of women in Britain to reenter the labor market via self-employment (Hillmert 2001).

In Britain, maternity leave has been relatively short, and before 1976, there was no guaranteed leave at all. In Germany, on the other hand, maternity leave had already been introduced in the 1950s (Kreyenfeld 2001). If mothers in Britain wanted to take any time at all off work after having a child, they risked losing their jobs. This may be reflected in the finding by Hall (2001) of diverging determinants of excess female downward occupational mobility in Great Britain and western Germany. Hall (2001) studies downward and upward occupational mobility for several birth cohorts ranging from 1926 to 1960. In western Germany, most of the difference in odds of

downward mobility between men and women could be explained by differences in level of education. This seems to indicate that in the cohorts included in the study, levels of education were lower for women than for men in western Germany. In Britain on the other hand, gender differences in the odds of downward occupational mobility could be explained by controlling for whether the employer change was voluntary or non-voluntary, and whether it happened after an employment interruption. I would assume that this finding could be due to a tendency of British mothers to take time out of the labor market without having maternity leave protection. There was no effect of employment interruptions on downward occupational mobility in western Germany. West German mothers had longer maternity leave protection, and maternity leave was not counted as an employment interruption in the model. By contrast, in Germany, the circumstance of having children as such had a positive effect on downward occupational mobility for women, independent of employment interruptions. In Britain there is only a general small positive effect of parenthood on downward mobility that is not gender specific (Hall 2001).

Other reasons for the effect of employment interruptions on downward occupational mobility for women in Britain could be that they cannot rely on standardized vocational degrees to the same extent as German women (Hall 2001). Also, part-time work, to which many women in Britain return after an employment break because of lack of childcare, usually involves low-skilled jobs, which will tend to be below their level of qualification (Hall 2001).

With the introduction of the *New Deal* programs by the Labour government after 1997, benefits for families with children have increasingly become dependent on parents participating in the labor market. This may be the reason that among children in lone parent households, the proportion of parents working increased between 1996/97 and 2002/03 (Brewer et al. 2005). Between 2002/03 and 2003/04, however, this proportion declined again. A similar pattern can be observed for the proportion of children whose parents are both working among those in two-parent households. The percentage of workless households decreased abruptly between 96/97 and 97/98. It then continued to decrease until 2002/03, whereafter there was a slight increase again<sup>13</sup> (Brewer et al. 2005).

---

<sup>13</sup> The authors assume that this rise might have to do with sampling errors (Brewer et al., 2005).

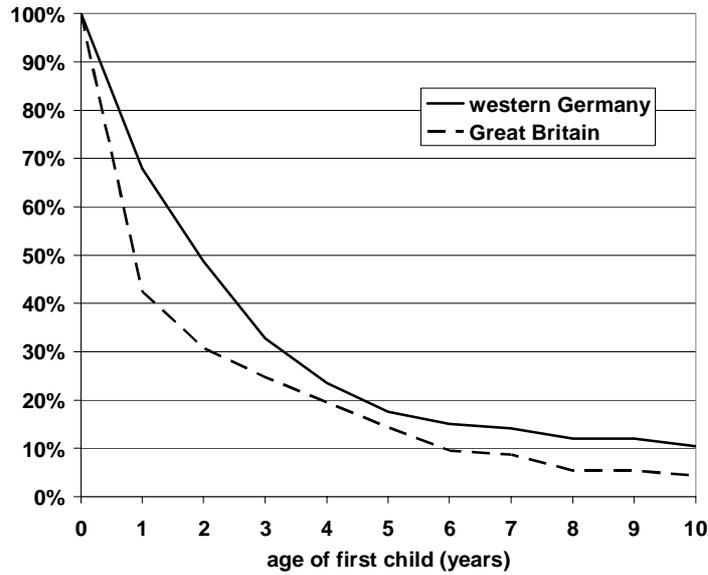
To summarize, British women in the 1980s and early 1990s returned to the labor market more quickly after first birth than did West German women (Gustafsson et al. 1996). However, the difference in the total duration of time that mothers of a first child spent outside the labor market may not have been as large between the two countries, since British women tended to stop working earlier before birth. Nonetheless, in tabulations of mothers' employment by age of youngest child, higher proportions of British than West German mothers are usually observed to be working at early ages of the youngest child. The model by Gustafsson et al. (1996) indicates that this may be due especially to greater proportions of British than German mothers of 2<sup>nd</sup> and 3<sup>rd</sup> children returning to the labor market. Concerning reentry rates after first birth, though, I would suspect that censoring at 2<sup>nd</sup> pregnancy might have produced different results than those reported by Gustafsson et al. (1996). Substantially more British than West German mothers of a first child have a 2<sup>nd</sup> child. Second pregnancy can be assumed to have a strong negative impact on return propensities. Therefore, censoring at 2<sup>nd</sup> pregnancy may have produced greater differences in reentry rates between British and West German mothers of a first child. Even planning to have a 2<sup>nd</sup> child may have lowered transition rates. In any case, reentry patterns may have changed since the 1980s and early 1990s, in part perhaps because of the New Deal programs requiring parents to work in order to receive benefits.

To check whether censoring at 2<sup>nd</sup> pregnancy and using more recent data affects results, survival curves for returning to employment for Great Britain and western Germany were estimated (figure 5.10-5.11). For the present context, censoring at 2<sup>nd</sup> birth is particularly important, because the aim is to specifically identify the consequences of having a first child, net of the impact of subsequent childbearing. The data used here refers to the years 1983-2001. The sample includes women who were working full-time at the beginning of pregnancy. As one can see, differences in the timing of returns to employment between Great Britain and western Germany are substantial. While over 50% of British mothers have returned to either full- or part-time employment within one year, it takes 2 years for half of the West German mothers to return to employment. A more close-up view of the survival curves reveals that 28% of British mothers returned to employment within the first month after birth, while this was the case for only 5% of West German mothers. These results indicate much greater differences in return patterns between British and West German mothers than those reported by Gustafsson et al. (1996). Differences in reentry patterns specifically

to full-time work are even more pronounced, as shown in figure 5.11. In Britain, half of the mothers of a first child had returned to full-time employment by the time the child was 5 years old. In western Germany on the other hand, over half of the mothers had not yet returned to full-time employment by the time their child was 10 years old. With respect to patterns of exit from employment between pregnancy and the birth of the first child, the results found here are more similar to those by Gustafsson et al. (1996). As shown in figure 5.12, I also find quicker exits from employment by British than West German mothers. Half of the British mothers had left full-time employment by 2 to 3 months before birth, while this was not the case for West German mothers until 1 to 2 months before birth. Exiting employment about 1 month later cannot however compensate for several years longer absence from employment after birth as compared to British mothers. Total durations of absence from employment around childbirth do appear to be substantially longer in western Germany than in Great Britain.

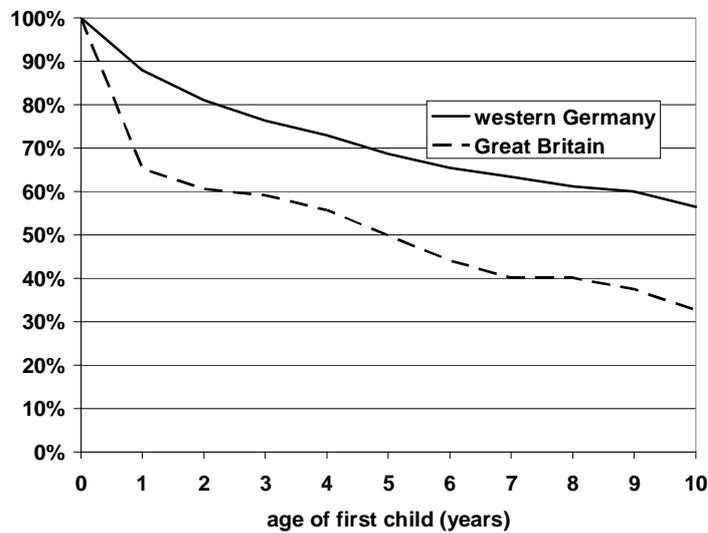
To summarize then, quicker returns to employment by British mothers may contribute to lowering opportunity costs. On the other hand, employment conditions for part-time workers seem to be worse in Britain than in Germany. While part-time employment rates for mothers are high in both countries, part-time work may thus more often lead to downward occupational mobility in Great Britain. In both countries, there is some evidence of a positive effect of education on rates of labor market reentry after first birth.

**Figure 5.10: return to full- or part-time employment after first birth  
(cohorts 1945-1984, time period 1983-2001)**



source: BHPS and SOEP<sup>14</sup> (own estimations)

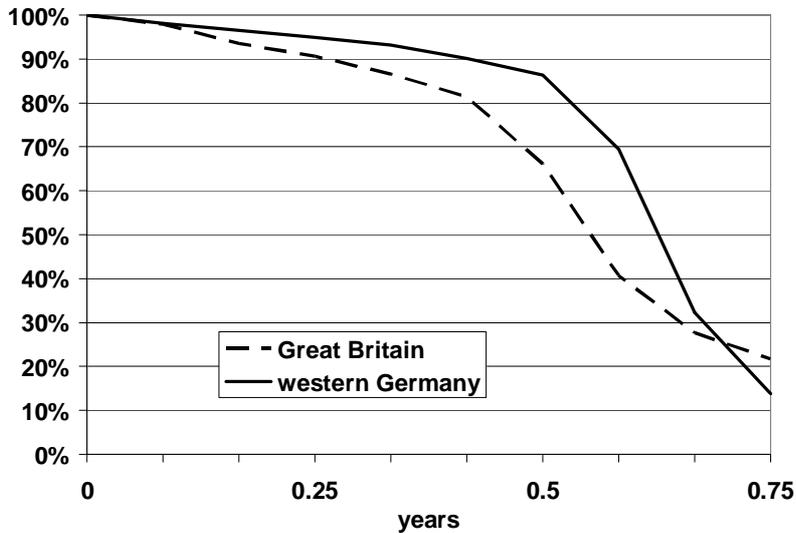
**Figure 5.11: return to full-time employment after first birth  
(cohorts 1945-1984, time period 1983-2001)**



source: BHPS and SOEP (own estimations)

<sup>14</sup> Monthly employment spells were prepared from the SOEP data with the help of *Spellsort* (Walke and Kreyenfeld 2006).

**Figure 5.12: exit from full-time employment between pregnancy and first birth  
(cohorts 1945-1984, time period 1983-2001)**



source: BHPS and SOEP (own estimations)

## 5.8 Inequality

### 5.8.1 Developments in the income distribution and differences between Great Britain and western Germany

The deregulation of the British labor market in the 1980s was accompanied by an increase in income inequality. In the meantime, income inequality has become substantially higher in Great Britain than in western Germany. Understanding differences in income inequality will be important for interpreting effects of income on fertility decisions. If income quintile, for instance, is used as a variable, one would expect stronger effects of respondents' position in the wage distribution where inequality is higher.

One way of tracking the development of income inequality is to compare income gains across quintiles. Brewer et al. (2005)<sup>15</sup> find that average annual income gain was relatively equal across quintiles during the Blair years. It was even slightly

<sup>15</sup> Brewer et al. (2005) base their analyses on data from the March 2005 Department for Work and Pensions (DWP) Households Below Average Income (HBAI) statistics, which uses information from the annual Family Resources Survey (FRS). For years prior to 1994/95, analyses are based on the Family Expenditure Survey (FES).

higher for the lowest quintiles<sup>16</sup>. In the Thatcher years, by contrast, average annual income gain was very high for the highest quintile, and very low for the lowest quintile. Income gains for the remaining quintiles fit in to form an almost linear positive relationship between income quintile and income gain. In the Major years, increases in income were generally very low. However, income gain was highest for the lowest quintile.

Another way to illustrate the development of inequality is to compare the growth of median and mean income. The annualized real average growth of both the median and the mean income was quite high, at 2.1% and 2.9% respectively, during the years of the Thatcher government. During the Major years, both measures were much lower, at 0.8% each. For the time of the Blair government, up to 2004, the growth rates were comparable to those in the 1980s again. However, the mean income grew somewhat more slowly, while there was slightly more growth in the median income. The strongest income growth during the Blair years took place between 1999/2000 and 2001/2002. Growth rates were very low between 2002/03 and 2003/04. According to Brewer et al. (2005), this was somewhat surprising, because economic growth was actually quite strong during this time. A possible explanation is a strong rise in National Insurance rates as well as taxes. The self-employed also seem to have had much lower growth rates than the rest of the population (Brewer et al. 2005). Comparing different household types, between 1996/97 and 2003/04, income growth rates were highest for lone parents and single pensioners.

The Gini coefficient can help to gain a rough picture of how the income distributions in Great Britain and western Germany compare, and how these have changed over time. The Gini coefficient can take values between 0 and 1, where 0 would indicate that everyone has exactly the same amount of income, while 1 would indicate that one person possesses all of the income in the particular society (Brewer et al. 2005). Brewer et al. (2005) present time series of the Gini coefficient for Great Britain based on net (after taxes and transfers) household equivalent income (table 1). They use the McClements scale to standardize household income<sup>17</sup>. The Gini coefficient

---

<sup>16</sup> Between 2002/03 and 2003/04, the highest income quintile even experienced a loss in average income. Income gains were generally very low for this year; however incomes for the lowest quintiles still slightly increased. This was most likely due to tax credits for low income households, while general tax levels increased, leading to lower net incomes for high income households.

<sup>17</sup> Instead of just dividing household income by the number of household members, following the McClements scale, one divides the income of a two-person household by 1.64, assuming economies of scale. Values for children depend on the age of the child, ranging from 0.15 for a child aged 0-1 to 0.6

based on this method of standardization was around 0.25 in Great Britain in 1979. Across the 1980s, the Gini coefficient increased by 0.08, to a value of about 0.33 in 1990. Between 1990 and 2003/04, then, there was not much change in the level of inequality as measured by the Gini coefficient. This was despite the introduction of major redistributive programs by the Blair government. Inequality even started to rise further between 1997 and 2000, this trend was then reversed up until 2003/04. Possibly, the new tax credits for low income families could only serve to keep inequality from continuing to rise. They were not, in any case, sufficient to bring inequality back down to the level of 1980 (Brewer et al. 2005).

Several different scales with which to standardize household income exist. This complicates comparisons of Gini coefficients, when they are based on alternate types of deflated household income. For example, the old OECD-scale assigns values of 1, 0.7, and 0.5 to the first household member, further adults, and children respectively. Since the late 1990s, EUROSTAT has been using a modified OECD scale, with respective values of 1, 0.5 and 0.3. OECD publications themselves have recently used a square root scale, whereby one divides household income by the square root of household size (OECD social policy division).

In calculations of the Gini coefficient for Germany, the Statistisches Bundesamt uses the old OECD scale. In a very detailed study of the development of inequality between 1984 and 1996, Biewen (2000) also uses this scale. Therefore, the Gini coefficients presented by Biewen (2000) and the Statistisches Bundesamt (2004) can be compared quite well. Unfortunately, however, they cannot be compared as easily to the coefficients for Great Britain, which are customarily based on the McClements scale. The McClements scale assumes larger economies of scale than the old OECD scale. Therefore, if larger families tend to have lower income, the McClements scale will produce lower estimates of inequality than the old OECD scale.

Biewen (2000) bases his analyses on SOEP data, and looks at eastern Germany and western Germany separately. He estimates a number of different summary measures besides the Gini coefficient in order to make certain that observations of

---

for a child aged 16 or over (DWP 2004). Brewer et al. (2005) and DWP (2004) give a value of 1 to childless couples, and standardize household income for other households to the equivalent for a childless couple. For better comparison with the OECD scale which standardizes to per capita income, I recalculated the McClements scale to also give per capita standardization values. So, the figures for the McClements scale given in this footnote assign a value of 1 to a one-person household, instead of to childless couples like in DWP (2004) and Brewer (2005).

inequality trends are not particular to a specific measure<sup>18</sup>. For western Germany, the Gini coefficient shows very little variation during the observation period between 1985 and 1996. Between 1992 and 1993, as well as 1994 and 1995, there were significant increases in most measures of inequality. However, the scale of the increases was quite small. The Gini coefficient increased from 0.254 in 1992 to 0.276 in 1995. This development was then reversed between 1995 and 1996, with a decrease back to 0.258. Biewen (2000) presumes that the hump in inequality in the mid-1990s may have been caused by a reunification boom for the West German economy. Altogether, there appears to have been a slight, though generally non-significant, decrease in inequality between 1985 and 1996. In any case, it seems that in western Germany, there was not the same increase in income inequality in the 1980s that there was in Britain. According to Förster (2000), however, income inequality had previously risen slightly in West Germany from the mid 1970s to the mid 1980s, while it had decreased during the 1970s in Great Britain.

Estimates of the Gini coefficient for more recent years, provided by the Statistisches Bundesamt (2004), are also based on SOEP data. Since they are using the same data and the same method of household income equivalisation, they should have the same figures for the years their study overlaps with that of Biewen (2000). However, the Statistisches Bundesamt (2004) gets slightly higher estimates of the Gini coefficient. This may be because Biewen (2000) uses weighted data. The table below shows different estimates of the Gini coefficient for West Germany and Great Britain. As noted above, the McClements scale as well as the modified OECD scale assume higher economies of scale than the old OECD scale. None-the-less, both the EUROSTAT estimates and the Brewer et al. (2005) estimates of the Gini coefficient for the UK<sup>19</sup> and Great Britain, respectively, are still higher than Gini coefficients estimated for West Germany using the old OECD scale. Assuming that larger families tend to have lower income, this seems to give relatively robust evidence of higher levels of inequality in Great Britain than in West Germany.

Due to disproportional attrition of low income households after the first year of the German SOEP panel, however, the values of Gini coefficient for Germany may

---

<sup>18</sup> The measures he estimates are the Gini coefficient, the Theil measure, the coefficient of variation, the Atkinson index with a low and a high inequality aversion parameter, the logarithmic variance, and the mean logarithmic variation

<sup>19</sup> Unfortunately, the EUROSTAT indicators are for the entire UK, instead of just Great Britain. Therefore, the different method of income equivalisation may not be the only reason for attaining different estimates than Brewer et al. (2005).

be slightly underestimated. For the first year of the SOEP panel, 1984, Biewen (2000), estimates a Gini coefficient of 0.277<sup>20</sup>. It is not clear to what extent underrepresentation of low-income households is a problem in the British data. Inequality in Germany, in any case, stayed quite constant until the end of the 1990s. Even a constant Gini coefficient around 0.28 would still be lower than the estimates for Britain, which were found to be between 0.32 and 0.35 across the 1990s.

Comparing Gini coefficients that were calculated using the same method of household income equivalization for both countries, the modified OECD scale, inequality seems to be clearly lower in Germany. Unfortunately, these values are not available for exactly the same years, and only for the United Kingdom instead of for Great Britain (table 5.1).

In the early 1980s, the Gini coefficient for Britain was much lower, and more comparable to German levels. While inequality was no higher in 2003 than in 1990 in Great Britain, inequality started to rise in the late 1990s in western Germany, with the Gini coefficient reaching a value of 0.279 in 2003. The Gini coefficients reported in the 2. Armuts- und Reichtumsbericht of the federal government, however, give no indication of rising inequality in the late 1990s and after 2000. This study uses the modified OECD scale, which assumes larger economies of scale. While estimates were still quite similar to those using the old scale in 1998, there was a strong divergence in 2003.

---

<sup>20</sup> The Gini coefficient for 1984 estimated by Biewen (2000) is not reported in the table because of problems of comparability with the remaining years. Though Biewen (2000) uses weighted data, it seems that disproportional attrition of low-income households within the first year of the survey may have offset the inequality measures. The Gini coefficient was 0.277 in 1984, and 0.264 in 1985. Particularly, however, those measures of inequality (such as the Atkinson index with a high inequality aversion parameter) that especially respond to changes at the lower end of the income distribution fell strongly from 1984 to 1985.

**Table 5.1:****Time series for the Gini coefficient in West Germany and Great Britain (or the UK)**

	West Germany			Great Britain	UK
	Biewen (2000)	Statistisches Bundesamt (2004)	2. Armuts- und Reichtumsbericht	Brewer et al. (2005) (approximate values from figure 2.7, p.22)	EUSI time series (source: EUROSTAT, European Social Statistics)
<i>Method of equivalisation of net household income</i>	old OECD scale	old OECD scale	Modified OECD scale	McClements scale	Modified OECD scale
1979				.25	
1980				.255	
1981				.26	
1982				.26	
1983				.265	
1984				.265	
1985	0.264			.28	
1986	0.267			.28	
1987	0.262			.3	
1988	0.262			.32	
1989	0.257			.32	
1990	0.257			.335	
1991	0.252	0.254		.335	
1992	0.254			.34	
1993	0.261			.34	
1994	0.266	0.267		.33	.33
1995	0.276			.33	
1996	0.258			.33	.34
1997		0.257		.34	
1998			0.257	.345	
1999				.345	.32
2000		0.259		.35	
2001				.345	
2002		0.275		.345	
2003		0.279	0.258	.34	

**5.8.2 Transfers**

The effect of labor market income on first birth risks may be buffered by public transfers. These however differ in extent between Great Britain and western Germany.

According to the Datenreport of the Statistisches Bundesamt, (2004), 59.5% of average household pretax income in Germany in 2001 was from labor market earnings, excluding income from self-employment. The proportion of average household income from self-employment was 0.3%. Public transfers accounted for 26% of household income. Redistribution plays a large part in reducing inequality. For west-

ern Germany, the Gini coefficient for net equivalized household income (old OECD scale, yearly income) was reduced by about 17% in 1991 and 1994 due to taxes and transfers. Afterwards, the reduction in inequality through taxes and transfers grew to values of between 19% and 21% for the years 1997 to 2003, with the strongest effects of redistribution in 1997 (Statistisches Bundesamt (ed.) 2004). According to Förster (2000), for the working age population, the share of public transfers in disposable income was 3% in Germany in 1994, and 10% in the United Kingdom. The role of transfers in reducing income inequality among the working age population was found to be greater in the United Kingdom, while the role of taxes was found to be greater in Germany in 1994 and 1995 (Förster 2000).

### 5.8.3 Poverty

If respondents' position in the income distribution is used as a variable in models of first birth risks, it will be important to keep in mind that having a position at the lower end of the income distribution can have very different implications. If it entails having very low levels of income, respondents' options are likely to be much more restricted than if income levels for the lower end of the income distribution are closer to those of the median.

Brewer et al. (2005) find that poverty, defined either as having below 50%, 60%, or 70% of median income, strongly increased in Britain during the 1980s. Between 1990 and 1991 or 1992, it continued to rise slightly, and then fell back to levels of the late 1980s again in 1995. There was a slight hump in levels of poverty in the late 1990s. By 2003 it had decreased again to about levels of 1988. So far, poverty has not decreased back to level of 1980 again. In 1980, about 13% of the population had a net equivalized (modified OECD scale) household income below 60% of the median. In 2003, this fraction was 16.8%. Highest levels of poverty were measured in 1992, when over 20% of the population had less than 60% of the median income.

In western Germany, relative poverty seems to have increased between 1990 and 2003. The percentage of people having less than 50% of the mean equivalized net household income increased from 8.9% in 1991 to 11.8% in 2003 (Statistisches Bundesamt (ed.) 2004). Unfortunately, this cannot be directly compared to the figures for Great Britain, since they were based on the median, not the mean income. An al-

ternate portrayal of the situation in western Germany does refer to the proportion having less than 60% of the median equivalized net household income. However, while the percentages having less than 60% of the median are given for western and eastern Germany separately, the median refers to the overall income distribution for both parts of Germany together. According to this measure, relative poverty in western Germany grew from 7.7% in 1991 to 13% in 2003 (Statistisches Bundesamt (ed.) 2004). These figures, however, were calculated using the old OECD scale, and thus cannot be compared to the British figures which are based on the modified OECD scale. The *2. Armuts- und Reichtumsbericht der Bundesregierung*, however, does use the modified OECD scale and comes up with a poverty rate for West Germany of 11% in 1998 and 12.2% in 2003<sup>21</sup>.

General poverty rates for 2003 for West Germany (12.2%) are thus found to be lower than those for Britain, at 16.8%. In the early 1990s, differences were greater. Poverty appears to have increased since then in Germany and decreased in Great Britain.

The prevalence of low wages also appears to be higher in Britain than in Germany. Robson et al. (1999) find using PACO data for Britain, Germany, Luxembourg, Spain, and the USA for the early 1990s, that the percentage of men earning hourly wages below two thirds of the median was lowest in Germany, at 11%, and was 21% in Britain. The percentage of full-time employed women earning below two thirds of the median male hourly wage was roughly the same in Britain (32%) and Germany (30%).

#### 5.8.4 Child poverty

Child poverty levels in Britain as well as Germany have generally been higher than poverty levels for the entire population. Measured as having net equivalized household income below 60% of the median, in Great Britain in 2003/2004, 20.5% of children were poor. This represents a decline from a fraction of 24.9% in 1996/97. Thus, while it is still higher, child poverty has decreased more strongly than general levels

---

<sup>21</sup> Here as well, 60% of median income refers to the median for East and West Germany together, although poverty rates using this boarder are presented for East and West Germany separately.

of poverty since the mid 1990s. Child poverty had risen strongly between 1980 and the early 1990s (Brewer et al. 2005).

Declines in child poverty are likely to be related to redistributive measures introduced by the Labour government, especially targeting children and low-income families. Many of the benefits required parents to be working. This is also likely to be the cause of increases in the proportion of lone parents working, as well as of dual earner parents in two-parent households (Brewer et al. 2005).

The age group with the highest poverty rate in Germany in 2002 (measured as having less than 60% of median equivalized net household income) are the 11 – 20 year olds. This, however, refers to East and West Germany together and uses the old OECD scale. Of this age group, 22.9% are poor, the next highest rates are among those aged 0 – 10 (17.6%) and those aged 21-30 (16.1%) (Statistisches Bundesamt (ed.) 2004). The 2. *Armuts- und Reichtumsbericht der Bundesregierung* seems to offer figures more comparable to those for Britain: they also use the modified OECD scale, and calculate figures for children of all age groups together. The problem is though, that they, too, only have figures for Germany as a whole. According to these measures, poverty rates for those aged 0-15 were 13.8% in 1998 and 15% in 2003.<sup>22</sup> Thus, the child poverty rate in 2003 for Germany as a whole seems to be about 5 percentage points lower than that for Britain. Child poverty rates appear to have converged since the mid 1990s, with child poverty increasing in Germany and decreasing in Great Britain.

## 5.9 Conclusions

This section summarizes the discussion in chapter 5, and draws together conclusions from this chapter with conclusions from chapter 3 on economic theories of fertility, and conclusions from chapter 4 on family policy in Great Britain and western Germany, in order to formulate hypotheses for the empirical analyses.

Chapter 5 has outlined differences in labor market conditions and in attributes associated with specific occupations between Great Britain and western Germany. These can lead to diverging effects of labor market status, occupation, and employ-

---

<sup>22</sup> They also have figures using the old OECD scale. Poverty rates for the under 15 year olds for Germany as a whole using this scale were 18.6% for both years.

ment characteristics on first birth risks in the two countries. To start with, labor market status may have a different effect on transitions to first birth in the two countries. Unemployment benefits are flat rate benefits in Britain, while they are related to previous income in Germany. Therefore, if the partner is primarily expected to be responsible for supporting the family, the partner's unemployment may have a stronger negative effect on first birth risks in Great Britain than in western Germany. Part-time employment is a mode of employment that is mainly made use of by mothers of small children in both countries. The implications for decisions to have a first child of expecting to have to switch to part-time employment are discussed in chapter 3, in the context of general economic models of fertility. Fewer women in either country work part-time before having a first child. However, as part-time jobs are generally very low paid service sector jobs in Great Britain, opportunity costs for women who are already in these jobs can be assumed to be especially low. In Britain, an increasing number of men also work part-time. Among labor market entrants, these are especially those without vocational degrees. Therefore, one might assume that these are quite marginalized jobs as well. An hypothesis would thus be that men's part-time work has a negative effect on first birth risks, especially in Great Britain.

In Germany, vocational degrees appear to be especially important to avoid early unemployment and to get a skilled job. This is likely to be due to the German vocational training system that enables a smooth transition from apprenticeship to employment. Those with vocational degrees even seem to be more likely than those with university degrees to have steady early careers. People with university degrees in Germany have become less likely to immediately enter a professional occupation in recent cohorts. For women, this could be an additional factor leading to a postponement of first birth for those with university degrees as compared to those with vocational degrees. If women plan to take some time out of the labor market after having a first child and afterwards to return, they will want to first establish a stable career and some employment security. For men with university degrees, this could also imply a postponement of the decision to have a first child. If they are expected to be primarily responsible for supporting their family, first births might be postponed until they have established their careers.

Furthermore, people with university degrees have higher probabilities of eventually acquiring a professional or managerial job and attaining higher earnings. Therefore, a presumption would be that at least there are positive effects for men of work-

ing in an occupation that requires a high level of skills, even if this type of occupation is not immediately acquired by all university graduates.

In Britain, the group of people without vocational degrees is larger than in Germany. Men without vocational degrees appear to be quite marginalized in the German labor market. Therefore, one could predict that women with partners who have no vocational degree have very low risks of first birth. For Britain, especially women who have no vocational degrees seem to have very low labor market prospects. This might especially have the effect of lowering the opportunity costs of having a first child. For men however, the effect of having no vocational degree on labor market outcomes does not seem to be as strong in Britain.

Women in manufacturing occupations seem to have quite low wages in both countries. First birth risks may therefore be anticipated to be higher for women in these occupations because of low opportunity costs. However their group is quite small. Men in unskilled manufacturing occupations are likely to have low risks of transition to fatherhood in both countries. In Britain, it appears that they attain very low wages, and in Germany, they seem to have very high risks of unemployment. Women in low-skilled service occupations likewise have low wages, especially in Britain, which may also imply low opportunity costs. However, service jobs are often part-time jobs in Britain, in which mothers of small children are often employed.

The group of women in technical and associate professional occupations is quite large in Germany. These occupations generally require quite a high level of training, and they can be expected to be moderately well paid. I would assume that women in these occupations have considerable opportunity costs of interrupting employment. On the other hand, they will usually not have extremely high earnings, so that privately organized child care will be relatively difficult to afford. The result may be that first birth risks for women in technical and associate professional occupations are lower than for those in low-skilled service or manufacturing occupations.

Clerical occupations are a very common type of occupation among women in Britain. Female full-time workers are overrepresented in these types of occupations, which indicates that clerical work is frequent among women even if they are not yet mothers. Skill levels and level of pay are likely to be in between service and associate professional jobs. Here, then, opportunity costs can also be taken to be moderate, and first birth risks in between those for women in low-skill occupations and those in technical and associate professional occupations.

Industry sector employment is more important for men in western Germany than in Britain. Especially, a large proportion of men in Germany work in crafts and related occupations. These occupations usually require a relatively high level of training and are likely to be well paid. Thus, an hypothesis is that first birth risks are quite high for women whose partner is employed in crafts and related occupations.

Both men and women are more likely to work in professional and managerial occupations in Britain than in western Germany. These are likely to be more secure and better paid than other types of occupations. Therefore, there may be a positive effect of the partner's occupation being a professional or managerial occupation. Among women, a large proportion of professionals are likely to be teachers in both countries. Teaching professions are generally strongly female dominated professions. As discussed in more detail in chapter 3, there is evidence for several countries that women employed as teachers have higher transition rates to first birth than women employed in other professional occupations. If social support for combining childcare and employment is higher in teaching than in other professions, a positive effect on first birth risks can be expected for Great Britain and western Germany as well.

Being employed in the public sector is related to higher wage levels for women in Germany, but not in Britain. While public sector employment is often more secure than private sector employment in Germany, high wage levels also raise the opportunity costs of taking leave. For Germany, therefore, it is difficult to make clear predictions for effects on first birth risks. As outlined in chapter 3, mothers in Britain who are public sector employees can more often profit from flexible employment options than private sector employees. Less is known about the relationship between public sector employment and family-friendly arrangements in western Germany. Since public sector employers have a longer planning horizon though, one can easily imagine that they are better able to provide flexible employment in western Germany as well. A further hypothesis is then that public sector employment has a positive effect on first birth risks in both countries.

In some occupations that typically involve self-employment, like being a doctor or a lawyer, it is possible to achieve quite a good income. Thus, one can presume that risks of first birth are higher for women with self-employed partners who have a high level of education. Especially in Britain though, it seems that there are also a lot of people working on a self-employed basis who do not even have a vocational de-

gree. These are likely to be very insecure modes of employment. This may by contrast lead to exceptionally low risks of first birth.

Firm size has a positive effect on women's wages in Britain. Higher wages may imply higher opportunity costs. On the other hand, as described in chapter 3, larger firms in Britain are also more likely to offer flexible modes of employment for parents. Again, less is known about the relationship between firm size and family-friendly arrangements in western Germany. In any case, firm discretion in providing family friendly arrangements may be more important in Great Britain, both because of women's quicker returns to the labor market and because of shorter statutory maternity leave. Especially after controlling for wages, firm size can be anticipated to have a positive effect on first birth risks, particularly in Great Britain.

In Britain, working long hours is very common for men. Possibly, working long hours also has a positive effect on career advancement and earnings. Thus, there is reason to presume a positive effect of men's work hours on first birth risks. If women are primarily expected to be responsible for childcare, long work hours can have a negative effect on decisions to have a first child.

The conclusion following from theories of fertility timing discussed in chapter 3 is that all women tend to gather some work experience before deciding to have a first child, that is, work experience will generally have a positive effect on first birth risks. Economic theories of fertility timing however predict a stronger effect for women with higher levels of education. Explicit tests of the effect of work experience on first birth risks will be conducted with data for Britain only. This is because the BHPS, but not the SOEP, provides complete employment histories. Effects of the interaction of occupation and age will be tested for both western Germany and Great Britain.

Another cause of postponement of first birth across early employment is that the right to statutory maternity leave has been dependent on employer tenure since its introduction in 1976, and the right to extended maternity leave still depended on employer tenure even after 1994. Therefore, one would expect women planning to have a child to wait until they have accumulated the required length of employer tenure. In chapter 8, the hypothesis is tested that the special requirements for maternity leave in Britain have an effect on fertility timing.

Because of the poor childcare infrastructure, families in both countries may have to depend on only one income for some time after the birth of a child. Therefore,

men's income can be expected to have a positive effect on decisions to have a first child in both countries. However, living on only one income is made a lot easier financially in Germany than in Britain. In addition to large tax saving, a moderate level of parental leave benefit is paid for a relatively long time. Child benefits are also comparatively high since 1996. For these reasons, I would expect a weaker effect of men's income on decisions to have a first child in western Germany than in Britain.

Income inequality did not change much in Britain and western Germany during the 1990s. Changes were greater during the 1980s in Britain and after 2000 in Germany. Inequality has been substantially higher in Britain than in western Germany throughout the 1990s. Therefore, the respondents' position in the income distribution is likely to affect first birth risks more strongly in Britain than in western Germany. Relative poverty has also been higher in Britain than in western Germany, especially at the beginning of the 1990s. Thus, being at the low end of the income distribution is likely to have different implications in Britain than in western Germany.

General levels of unemployment were much higher at the beginning than at the end of the 1990s in Britain, especially among men. Therefore, effects of men's education may well be stronger at the beginning of the 1990s, as employment insecurity is likely to be felt most strongly by those with low levels of qualifications. The development was in the opposite direction in Germany.

Childcare, especially for children aged under 3, can be very expensive in both countries. However, the level of acceptance of making use of childcare seems to be higher in Britain. Therefore, there might at least be a kind of a U-shaped effect of income on decisions to have a first child for women in Britain. Among women with moderate to high levels of income who can afford childcare, women with high income may be more likely to decide to have a first child, because they will have more income left after paying for childcare. The introduction of the childcare element of the WFTC in 1999 may have made employment and parenthood more compatible for low income families in Britain. However, the data I will be using only covers the time period of 1991-2001. The period after 1999 is thus probably too short for possible effects of the reform to become visible.

In western Germany, by contrast there is reason to predict a straightforward negative effect of women's income on first birth risks. This is because it is not very common in western Germany to make use of purchased childcare for young children.

Women with higher levels of income will thus also have higher opportunity costs if they resort to parental leave.

## Chapter 6

### Data and Method

#### 6.1 Introduction

The data used for this study is from the British Household Panel Survey<sup>23</sup> (BHPS) and the German Socio-Economic Panel (SOEP)<sup>24</sup>. These two data sets are very similar in content and structure, thus offering a good basis for comparison. In both panels, respondents are surveyed once a year. All members of the household are surveyed, so that one also has information on the family members' characteristics. The SOEP began earlier, in 1984, while the BHPS began in 1991. For the comparison between Great Britain and western Germany in chapter 7, only information for 1991-2001 was used from both surveys for better comparability. For the analysis of the effect of work experience on first birth risks in chapter 8, retrospective parts of the BHPS were combined with panel data. Since the BHPS has complete retrospective employment histories, while the SOEP does not, the analyses in chapter 8 are restricted to Great Britain.

This chapter begins with a discussion of data preparation to combine the retrospective and panel elements of the surveys. This was necessary to obtain complete employment and partnership histories from the BHPS. Birth histories from both the SOEP and the BHPS also rely on a combination of panel and retrospective data. Next, the preparation of panel data for the comparison of Great Britain and western Germany in the 1990s is discussed. This is followed by a short description of the sample selection. Finally, the formulas of the models used in the analysis are shown.

---

<sup>23</sup> The BHPS data used in this study were made available through the ESRC Data Archive. The data were originally collected by the ESRC Research Centre on Micro-social Change at the University of Essex (now incorporated in the Institute for Social and Economic Research). Neither the original collectors of the data nor the Archive bear any responsibility for the analyses or interpretations presented here.

<sup>24</sup> Die in dieser Dissertation verwendeten Daten des Sozio-oekonomischen Panels (SOEP) wurden vom Deutschen Institut für Wirtschaftsforschung (DIW), Berlin, bereitgestellt.

## 6.2 Data preparation

### 6.2.1 Combining retrospective and panel data

At each panel wave of the BHPS, respondents are asked for their activity histories for the past year. The starting and ending months of main activities (such as employment, education, unemployment, or family care) across the preceding year are recorded without gaps. In addition, in the 2<sup>nd</sup> wave in 1992, complete retrospective fertility, partnership, and employment status histories were collected. In the 3<sup>rd</sup> wave, in 1993, more detailed employment histories, including employer changes, were collected as well. For the preparation of employment histories, the programming done by Gillian Paul (2003) was a very important guideline. Paul (2003) provides very good documentation of data preparation to combine the panel employment spells and the retrospective employment spells collected in waves 2 and 3. In some parts of the data preparation, I followed the programming by Paul (2003) very closely. Sometimes, though, I did things differently. For example, Paul (2003) combines the retrospective employment status histories collected in wave 2 and the retrospective employer spell histories collected in wave 3 into one joint data set. In this manner, a data set that has both detailed information on the labor market status and on employer tenure is obtained. However, I decided not to combine the two retrospective files, but to use them each individually and to connect each one to the panel employment information separately. I did this because the employment spells in the two retrospective files do not match precisely and it is difficult to decide which version to accept when they diverge. Instead of strongly adjusting the spells in one of the files to make them match to the other, or throwing out a large number of cases when they diverged, I decided to preserve the spells in both files as far as possible. Throwing out cases with divergences would have had the advantage of keeping only the most reliable cases. On the other hand, it might have increased the sample bias. Using both files separately has the advantage of being able to gain an impression of how much the divergences impact results. When I later ran estimates of the effect of employment duration on first birth risks using both files separately, the results in each case were very similar.

Another point where I prepared employment histories differently than Paul (2003) was when it came to defining part-time employment spells. The retrospective

employment status history distinguishes between part-time and full-time employment spells. For the retrospective employer spells, by contrast, respondents are asked whether they were working full-time or part-time, but changes in work hours while they were still working for the same employer were not taken account of. At each panel wave, respondents are asked for the work hours of their current job. However, they are not asked to distinguish between full-time and part-time work when reporting further employment spells since the last wave if they did not change employers. So, completely reliable information on whether the respondent was working part-time or full-time was not available at all time points. Paul (2003) thus does not distinguish between full-time or part-time employment in preparing the employment spells. However, for my analyses, it was very important to distinguish between part-time and full-time employment. Therefore, I approximated the respondents' part-time/ full-time employment status in the employer histories by assuming that work hours remained constant while working for the same employer. For the spells collected during the panel, I used the part-time/full-time status information from the current job and the information given for employer changes between waves, again assuming that work hours remain constant while the respondent is working for the same employer, or until the next wave.

The file obtained by combining the retrospective employment status information from wave 2 with the panel employment spell information was used to analyze the effect of continuous work experience on first birth risks in section 8.2. The file obtained by combining the retrospective employer spell histories from wave 3 with the panel employer spells was used for the analysis in section 8.3. There, the question that was investigated was whether the special employer tenure requirements for maternity leave in Great Britain had any effect on first birth timing.

To obtain continuous partnership histories, I combined the retrospective partnership histories that were collected in wave 2 of the BHPS with panel information. While the retrospective information collected in wave 2 is quite straightforward, during the panel, partnership formation and dissolution dates were not directly asked for. The partnership status and the partner id at the time of each survey are known, but the exact month of a new partnership formation or dissolution between waves during the panel had to be deduced from residential moving dates of the partners. The result of data preparation was a file with complete marriage and cohabitation histories, with an indicator for the union order. Unfortunately, no information on the partner's education

or employment characteristics was available from the retrospective files. If analyses are restricted to the 1990s, information on the partner's characteristics can be used.

Retrospective birth histories are collected as well in wave 2 of the BHPS. During the panel, birth dates of new babies in the household are recorded at each wave, along with the survey ids of their biological mother and father, if they are living in the household. Thus, I was able to match new babies to women in my sample. A problem is though that births are not recorded if the new baby is not living in the same household. This will lead to a slight underreporting of fertility. For women though, this problem is likely not to be as serious as if one were studying men.

For Germany, I used birth histories prepared from SOEP data by Michaela Kreyenfeld. The months of birth are not initially included in the birth histories, and so Kreyenfeld matches them to the children's birth years from the yearly wave files as well as from single SOEP data files containing additional information on dates of birth. The same was done for the date of last interview. The ordering of births in the SOEP data was also not always correct and thus was also adjusted by Kreyenfeld.

### **6.2.2 Panel data on employment characteristics for the 1990s**

For the comparison of the effects of employment characteristics on first birth risks in the 1990s between Great Britain and western Germany in chapter 7, annual panel data as well as the monthly birth history files described above were used. In both the BHPS and the SOEP, many detailed employment characteristics are collected only once a year. To prepare data sets containing annual employment data, a method employed by Kreyenfeld (2005) was followed. Applying this method, the annual information collected at each wave is assumed to be constant for the time period reaching from 6 months before the date of the interview until 6 months before the next interview. If respondents were missing at one wave, the time span pertaining to that wave is excluded from the analysis. Since births are backdated by 9 months, one can be sure that the employment information used to predict birth risks was recorded before the birth. This is important, since women's employment status often changes after the birth of a child. One cannot be sure, though, that the employment information was recorded before the conception. Employment information can have been recorded up to a maximum of 6 months after conception. This is somewhat problematic. However, it

is not so common for women in either country to interrupt employment much in advance of giving birth.

### 6.3 Sample Selection

The samples for both western Germany and Great Britain basically consist of women born in the respective country who were at least 16 in 2001. The place of birth was used as a criterion for whom to include in the sample. This seemed to be the best method to make the samples for the two countries comparable. Citizenship is not a suitable criterion, since it is not well recorded in the BHPS. Also, whereas almost all people born in the UK are also citizens of the UK, this is not the case for Germany. The groups of citizens and non-citizens in the two countries are thus not at all comparable. Therefore place of birth, and not citizenship, was used as a sample selection criterion.

For western Germany, then, the West German sample of the SOEP (sample A) as well as the foreigner sample (sample B) were used. From these two samples, those respondents were chosen who were born in Germany<sup>25</sup>. The resulting sample size for western Germany was 1837 respondents. Of these respondents, 481 had a first child during the study period. All analyses for western Germany were weighted to account for the difference in sampling probability between samples A and B. The sampling probability for sample B was four times higher than for sample A. For the BHPS, only members of the initial sample were included, and not members of any of the extension samples that joined the BHPS later between waves 7 and 11. The initial sample members were all residents of England, Wales, or Scotland south of the Caledonian Canal. If they moved to Scotland north of the Caledonian Canal in subsequent waves, they were followed. However, the initial sample excludes Scotland north of the Caledonian Canal and Northern Ireland. From this sample, those respondents were selected who were born in the UK. The data set used for the comparison with western Germany has a sample size of 1498 respondents, of whom 389 had a first child during the study period. For the comparison with western Germany, only the panel data collected in the 1990s was used. To study the effect of employment duration on first birth risks, retro-

---

<sup>25</sup> When survival curves for first birth were run using the resulting sample of people born in Germany, practically no differences were found between German citizens and foreigners.

spective data including the respondents' complete employment and fertility histories was used. The sample size here was 3273. During the study period, 2063 first children were born.

#### 6.4 Hazard models for risk of first birth

In chapter 7, the effect of employment characteristics on first birth risks<sup>26</sup> is studied. The general formula used for the models in chapter 7 is:

$$\ln h_i(t) = y(t) + \sum_{k=1}^m \beta_k w_{ik}(t)$$

The log risk of first conception is  $\ln h_i(t)$ . The baseline duration used is age ( $t$ ), measured in time since the respondent turned 16. Accordingly,  $y(t)$  is the log baseline risk of first conception. In chapter 7, the log baseline risk of first conception is modeled in a piece-wise constant manner. The  $w_{ik}(t)$  are time-varying variables, and the  $\beta_k$  are coefficients for the effects of the time-varying variables on the log risk of first conception. Not all of the time-varying variables were used in the same model. In all, 15 models were estimated. The following time-varying variables were all used in at least one model: educational attainment, employment status, firm size, sector, self-employment, total work hours, occupation, earnings, partnership status, the partner's education, an interaction between the partner's education and calendar time, the partner's employment status, an interaction between the partner's education and self-employment, the partner's total work hours, the partner's occupation, and the partner's earnings.

In section 8.2 of chapter 8, the effect of employment experience on first birth risks is studied. The general formula used for the models in this section is given below.

---

<sup>26</sup> In this and the following chapters, the expression 'first birth risks' is sometimes used for simplicity, although first birth was backdated by 9 months. Thus, the object of study is always risk of first conception, even if the expression 'first birth risks' is sometimes used.

$$\ln h_i(t) = y(t) + \sum_{k=1}^l \alpha_k x_{ik} + \sum_{k=1}^m \beta_k w_{ik}(t) + \sum_{k=1}^n z_k(t - v_{ik})$$

The baseline duration again is age ( $t$ ), measured in time since the respondent turned 16. Here though, the log baseline risk of first conception,  $y(t)$ , is modeled as a piecewise linear spline. In the second model used in section 8.2, age is interacted with education. Then we have a set of age splines,  $y_k(t)u_{ik}(t)$ , where the  $u_{ik}(t)$  are a set of time-varying dummy variables indicating the respondent's level of education. In both models, only one time-constant variable, cohort membership, is included. A set of dummy variables for cohort membership is given by the  $x_{ik}$ , and the  $\alpha_k$  are the coefficients for the effect of cohort membership on the log risk of first birth. Time-varying variables in the models are given by the  $w_{ik}(t)$ . These are employment status, previous employment experience, union order, and (in the model without the interaction effect) educational attainment. Further duration splines are union duration, marriage duration, and present full-time employment duration. The duration since the beginning of each process is given by  $(t - v_{ik})$ , where the  $v_{ik}$  represent the length of the interval between the time the respondent turned 16 and the beginning of the given process. The splines giving the effects of duration in each given state on the log risk of first birth are the  $z_k(t - v_{ik})$ . In the second model in section 8.2, full-time employment duration was also interacted with education. Then, the corresponding set of duration splines for the effect of full-time employment duration by education is among the  $z_k(t - v_{ik})$ .

The impact of employer tenure on first birth risks is studied in section 8.3 of chapter 8. In the employer tenure data used for this section though, one cannot distinguish whether a person is unemployed or in education. To deal with this problem, the effect of employer tenure was estimated separately for those over and under 22 years of age. A control variable for being not employed is included, but the composition of this category changes with age. Up to about 22 years of age, many of those who are not employed are in education. After that age, the proportion of the not employed who are in education is much lower. So, the idea was to account for the difference in the composition of the not employed by estimating the effect of employer tenure separately for those aged under and over 22 years.

The effect of age was additionally estimated separately for those over and under 20 years of age. Here, the problem was that we do not know exactly when a person gained a certain school degree, we only know which was the highest degree achieved. There is only very rough information on how old a person was when she finished school. When, as in the data used for section 8.2, times of educational participation are additionally known, the time when a person gained a degree can be approximated. In the employer tenure data used for section 8.3, however, there is no information on when the respondent was taking part in education. So, in this model, level of education was not controlled for under the age of 20; it was only controlled above the age of 20. The effect of age was allowed to jump at the age of 20, because at this point, the school degree is added as a control variable.

The formula for the model used in section 8.3 is:

$$\ln h_i(t) = y(t) + \sum_{k=1}^m \beta_k w_{ik}(t) + \sum_{l,j=1,1}^{l,j=3,4} (z_{lj}(t - v_{ilj}) * u_{il}(t) * c_{ij}(t))$$

In this model, the age spline  $y(t)$  is allowed to jump at age 20. Time varying variables, given by  $w_{ik}(t)$ , are previous employment duration, educational attainment, as well as a set of variables indicating whether one is self-employed, full-time employed, part-time employed, or not employed. The effect of employer tenure,  $z_{ij}(t - v_{ilj})$ , is interacted with both education and calendar time. The set of dummy variables for educational attainment is indicated by  $u_{il}(t)$ , and the set of dummy variables for calendar time is indicated by  $c_{ij}(t)$ . There are 3 levels of education and 4 periods of calendar time. The difference in time between the beginning of a job with a new employer and age 16 is  $v_{ilj}$ . The episodes are split by level of education and calendar time, so that employer tenure splines sometimes become active later than the beginning of the employer spell. None-the-less, the origin of the spline is always the beginning of the employer spell.

In chapter 9, models for the risk of first birth and for the risk of entry into non-employment are run simultaneously. The model for the risk of first birth is:

$$\ln h_i(t) = y(t) + \sum_{k=1}^l \alpha_k x_{ik} + \sum_{k=1}^m \beta_k w_{ik}(t) + U_i$$

Here again, the baseline duration is age. The only time-constant variables are a set of dummy variables for cohort membership. Time varying variables are partnership status, employment status, work experience, and educational attainment. Individual level unobserved heterogeneity is represented by  $U_i$ .

The second equation, shown below, is for the risk of transition from employment to non-employment:

$$\ln h_i(t) = y(t) + \sum_{k=1}^l \alpha_k x_{ik} + \sum_{k=1}^m \beta_k w_{ik}(t) + z(t - v_i) + V_i$$

The baseline duration, here too, is age. The only group of time-constant variables is again for cohort. Time varying variables are partnership status, employment status, previous work experience, and educational attainment. There is one additional duration spline for the duration of the present full-time employment spell, represented by  $z(t - v_i)$ , where  $v_i$  is the distance in time between age 16 and the beginning of the employment spell. Individual level unobserved heterogeneity is represented by  $V_i$ .

When the two models are run simultaneously, correlation between unobserved heterogeneity in the first process,  $U_i$ , and unobserved heterogeneity in the second process,  $V_i$ , is controlled for.

## Chapter 7

### **Employment and First Birth in the 1990s: Great Britain and western Germany compared**

#### **7.1 Introduction**

This chapter compares the impact of employment characteristics on first birth risks during the 1990s in Great Britain and western Germany. Because of the different labor market and welfare state contexts, different impacts of the employment situation on first birth risks are anticipated. Firm size and employment sector for instance are hypothesized to have stronger effects in Great Britain because of more limited statutory requirements for maternity leave and the better ability of large firms and public sector employers to provide supplementary leave and flexible employment schedules. The partner's earnings and labor force attachment are likely to be quite important in both countries, because of a similarly poor childcare infrastructure and an adherence to the male-breadwinner model. However, men's position in the earnings distribution is expected to have a stronger positive effect in Great Britain, because of greater earnings inequality and lower transfers. Men's level of vocational training may be especially important in times of high labor market insecurity. Therefore, it is likely to have a stronger effect when unemployment is high, that is, at the beginning of the 1990s in Great Britain, and near the end of the 1990s in western Germany. Women's earnings are hypothesized to have a negative effect in western Germany and a U-shaped effect in Great Britain, because of a generally low level of acceptance of childcare in western Germany, and relatively high costs of childcare in Great Britain. Assuming a largely traditional division of labor in the household, the anticipation with respect to long work hours is that they will have negative effects on first birth risks for women and positive effects for men in both countries. Models testing hypotheses with respect to the effect of occupation and self-employment, derived earlier, will also be discussed in this chapter. The chapter concludes with a discussion of the timing of child-bearing by education.

This chapter starts out by generally comparing levels of childlessness and first birth timing of the cohorts at risk of first birth during the 1990s. This is followed by

the discussion of models analyzing the effects of education and employment status on first birth risks, before moving on to looking more closely at the impact of the employment attributes named above.

## **7.2 A general comparison of first birth timing and ultimate childlessness in Great Britain and western Germany**

To compare developments in the ultimate level of childlessness and timing of first birth, survival curves using complete cohort data from the BHPS for Great Britain and the SOEP for western Germany were calculated for cohorts 1945 to 1984. These cohorts are the ones that go into the analysis of determinants of first birth in the two countries during the 1990s. However, in the remaining sections of this chapter, only data pertaining to the 1990s was used. The survival curves shown in this section use fertility histories for ages 16-45, even if this age span was partly located before the 1990s. Episodes were censored at age 45, in 2001, or at the time of the last interview.

As one can see from figures 7.1 and 7.2, the median age at first birth was still lower in western Germany (age 23), than in Great Britain (approximately age 24.5) in cohort 1945-49. After that, the median age at first birth increased in both countries, but much more so in western Germany. By cohort 1970-74, the median age at first birth had risen to age 30 in western Germany, and to almost age 29 in Great Britain. Most of the change in timing of first birth in western Germany took place between cohorts 1945-49 and 1965-69. Timing differences between cohorts 1965-69 and 1970-74 are very small in western Germany, at least until the end of the observation period in 2001, corresponding to age 31 for cohort 1970. In Great Britain by contrast, timing differences were not as large between cohorts 1945-49 and 1965-69. The median age at first birth increased by only 2 years, in contrast to almost 7 years in western Germany, between these two cohorts born 20 years apart. Instead, between the neighboring cohorts 1965-69 and 1970-74, there was an additional increase of 2 years in median age at first birth in Great Britain, while in western Germany, there was practically no change in timing here. So, the shift to older ages at first birth seems to have set in somewhat later in Great Britain than in western Germany.

Ultimate levels of childlessness were lower in each cohort group between 1945 and 1964 in Great Britain than in western Germany. The level of childlessness

for cohort 1965-69 in 2001, at age 36, was by contrast approximately equal between the two countries, at 23%.

The levels of childlessness at age 45 in Great Britain shown here are roughly comparable with the estimates by Smallwood (2002), who uses General Household Survey data to adjust register data. Register data in Great Britain does not report the true birth order, so that adjustments based on survey data such as those conducted by Smallwood (2002) are necessary. The birth dates in the birth histories used to calculate the survival curves presented in figures 7.1-7.6 were backdated by 9 months. Therefore, the figures given by Smallwood (2002) for age 40 are more closely comparable to the figures for age 39 given here. It seems that the survival functions calculated here (figure 7.1) for cohorts 1945-1959 slightly underestimate childlessness at age 44 by about 1-2 percentage points, compared to the estimates by Smallwood (2002). However, for cohort 1960-64, the deviation is more serious. At age 39, the estimate here is 16%, while Smallwood (2002) reports a level of childlessness of 20% for cohort 1960 at this age. A problem may be that case numbers in the data I used are very small for this cohort near age 39. Looking at age 34, however, differences are still relatively large. Smallwood (2002) estimates a level of childlessness at age 35 of 23% for cohort 1960 and 25% for cohort 1965. The estimate reported here in figure 7.1 for cohort 1960-64 at age 34, by contrast, is only 20%. Estimates for cohort 1965-69, however, again correspond very closely to the estimates by Smallwood (2002). So, there must be something wrong in particular with the estimates for cohort 1960-64 shown here in figure 7.1.

Register data in Germany does not record the true birth order either. Kreyenfeld (2002) adjusts register data using survey data from the Socio-Economic Panel (SOEP). The estimates obtained directly from the SOEP shown in figure 7.2 correspond relatively closely to the figures reported by Kreyenfeld (2002). However, the level of childlessness at age 34 shown in figure 7.2 for cohort 1955-59 appears to be slightly overestimated at 25%, as this is 2-3 percentage points higher than the level of childlessness at age 35 reported in Kreyenfeld (2002). Kreyenfeld (2002) finds a level of childlessness of 22% for cohorts 1955-56, and 23% for cohorts 1957-59.

figure 7.1

Great Britain: survival curves for first birth by cohort

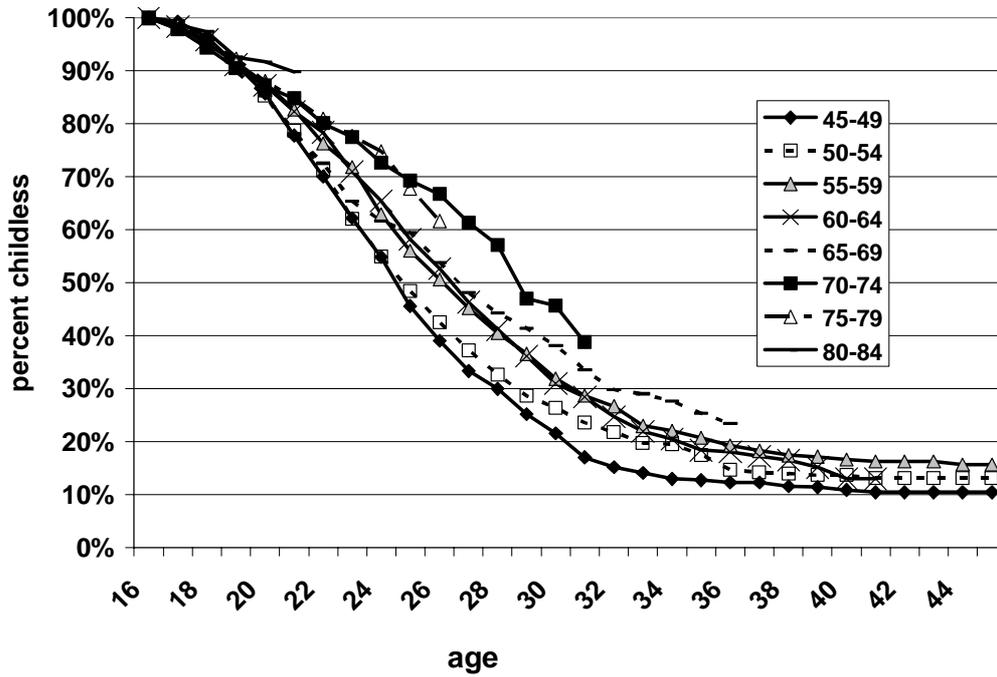
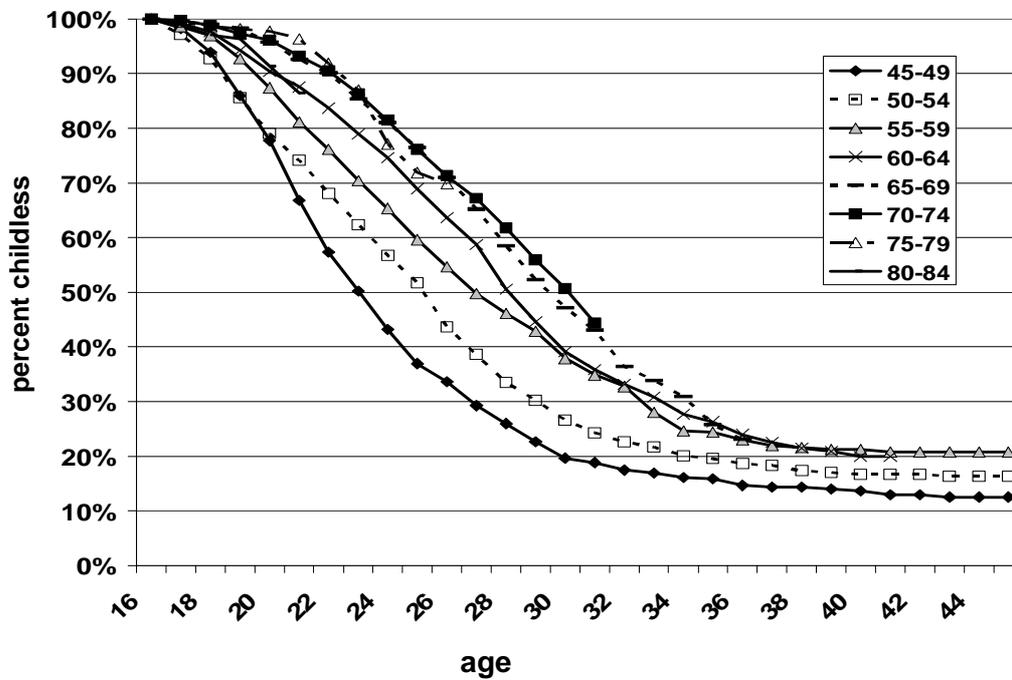


figure 7.2

Western Germany: survival curves for first birth by cohort



### 7.3 Ultimate childlessness and first birth timing by education

Figures 7.3-7.6 compare first birth patterns by educational attainment between cohorts 1945-54 and 1955-64 in Great Britain and western Germany. For these survival curves, the final level of educational attainment at time of interview is used. Of course, this is anticipatory analysis. As pointed out by Hoem and Kreyenfeld (2006), the effect of education on fertility can be distorted when one uses the level of education at time of interview, because the temporal order of the two events is not respected. Women can have a child before achieving their highest level of education. Also, having a first child can have been the cause of not having achieved a higher level of education. The authors present a way to approximate educational histories when only the level of education at the time of interview is available. In that way, educational attainment can be included as a time-varying variable in event history models, yielding more accurate estimates than if education were only included as a time-constant variable. Current levels of educational attainment actually are available from the data used in this chapter. However, for the survival curves presented here to start with, this information was ignored and only the final level at interview was employed. The intention is to at least give a rough picture of ultimate childlessness by educational attainment in the two countries. The event history models discussed in the remainder of this chapter which by contrast do use current educational attainment do not allow a clear distinction between timing and probability of first birth.

Hoem and Kreyenfeld (2006) suggest an alternative way to calculate values for survival curves using the probability of achieving a given level of education and having a child by a particular age. However, to obtain survival curves by education one still needs to condition on the final level of attainment. In the following though, I did not use this method, but instead the simpler and less precise method of estimating ordinary Kaplan-Meier survival curves by final level of educational attainment.

Figures 7.3-7.4 indicate that the level of childlessness at age 45 for women with a university degree increased between the cohort groups 1945-54 and 1955-64 in Great Britain. In the older cohort, only 20% of women with a university degree remained childless, while this proportion grew to 29% for the younger cohort. For women with vocational degrees or no degrees, the level of childlessness did not change much. In both cohorts, at age 45, about 10% of women with no degree and 13% of women with a vocational degree remained childless. In the younger cohort, at

age 39 though, 16% of women with a vocational degree are still childless. These figures correspond approximately to those presented by Smallwood (2003), who using data from the ONS Longitudinal Study (LS), finds that 22.5% of women with higher educational qualifications born between 1954-58 were childless in 1998. For women without higher qualifications, Smallwood (2003) finds a level of childlessness of 15.2%.

In western Germany, by contrast, there was not much change in the level of childlessness at age 45 for women with university degrees between these two cohorts. According to the estimates shown in figures 7.5 and 7.6, childlessness was at about 35% in both cohorts. Again in divergence to Great Britain, levels of childlessness increased for women with vocational degrees or no degrees, to 18% and 19%, respectively. In the older cohort, for those with no degree, the level of childlessness at age 45 had been about 7%, while it had been about 14% for those with vocational degrees.

Using data from the 1992 German Family and Fertility Survey (FFS) Hoem and Kreyenfeld (2006) find a level of childlessness of 41.21% at age 39 for women with a university degree when estimating ordinary Kaplan-Meier survival curves. For women with a vocational degree or no degree, the corresponding figures are 26.03% and 21.5% respectively. When calculating survival curves based on the probability of having attained a certain level of education and having become a mother by each of a number of age steps, they find a level of childlessness for women with university degrees of 33.1%, for women with vocational degrees of 23.79%, and for those with no degree of 14.74%. The figures obtained by both methods are somewhat different from the levels of childlessness at age 39 shown in figure 7.4 for cohort 1955-64. The figures here are 19% for both those with a vocational degree or no degree, and 35% for those with a university degree. It is difficult to find reasons for these divergences, since there are not many large surveys including births by birth order that could be used to evaluate these estimates.

In any case, although childlessness has increased for women with university degrees in Great Britain, it still remained lower than in western Germany in cohort 1955-64. For women with no degree, childlessness seems to have been lower in the older cohort and higher in the younger cohort in western Germany than in Great Britain. Of women with vocational degrees, the proportion that was childless at age 45 was about the same in the two countries in the older cohort, and higher in western Germany in the younger cohort.

With respect to timing, the median age at first birth seems to have increased most between these two cohorts for women with vocational degrees in western Germany, and for women with university degrees in Great Britain. For both groups, there was an increase in median age at first birth of about 3 years.

figure 7.3  
 Great Britain: survival curves for first birth by education  
 cohort 1945-54

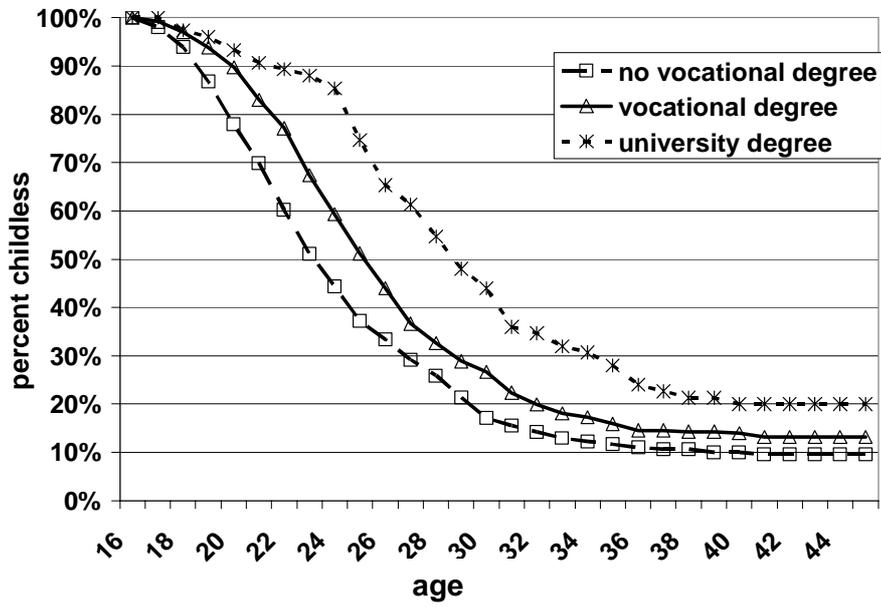


figure 7.4  
 Great Britain: survival curves for first birth by education  
 cohort 1955-64

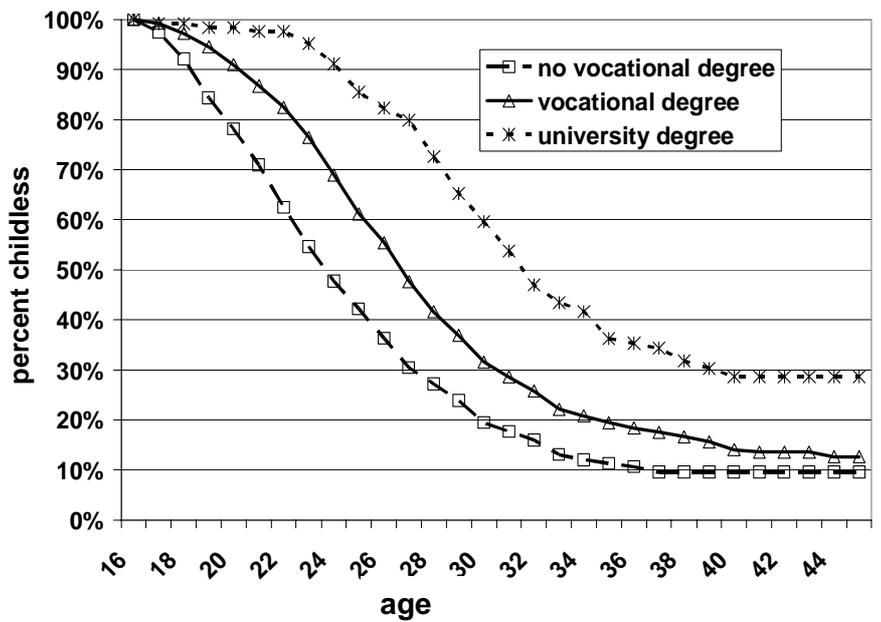


figure 7.5

Western Germany: survival curves for first birth by education cohort 1945-54

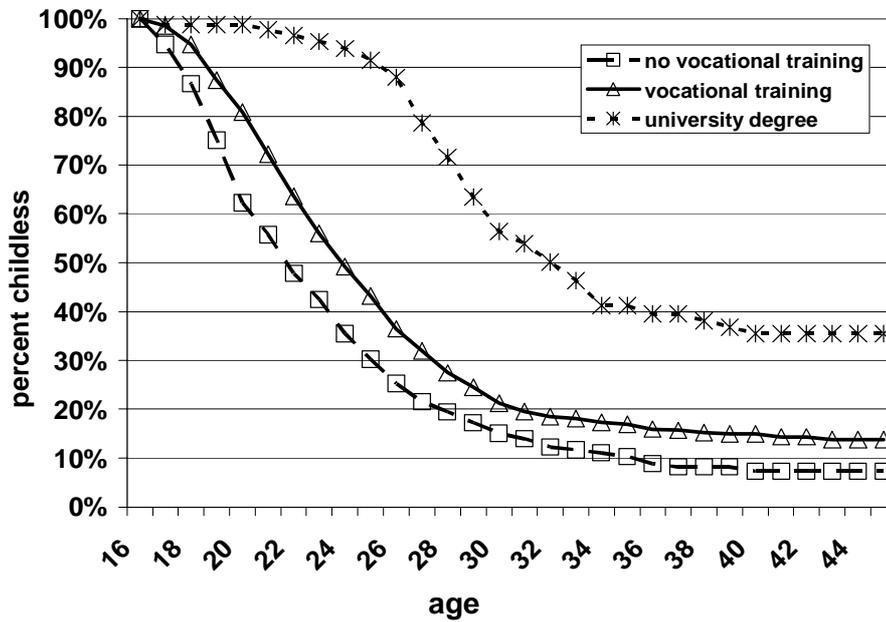
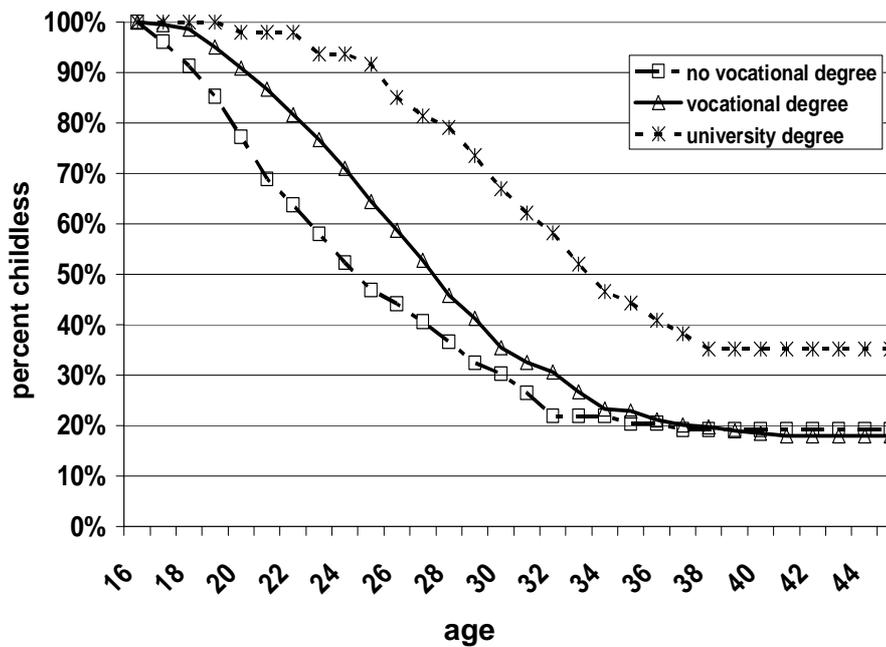


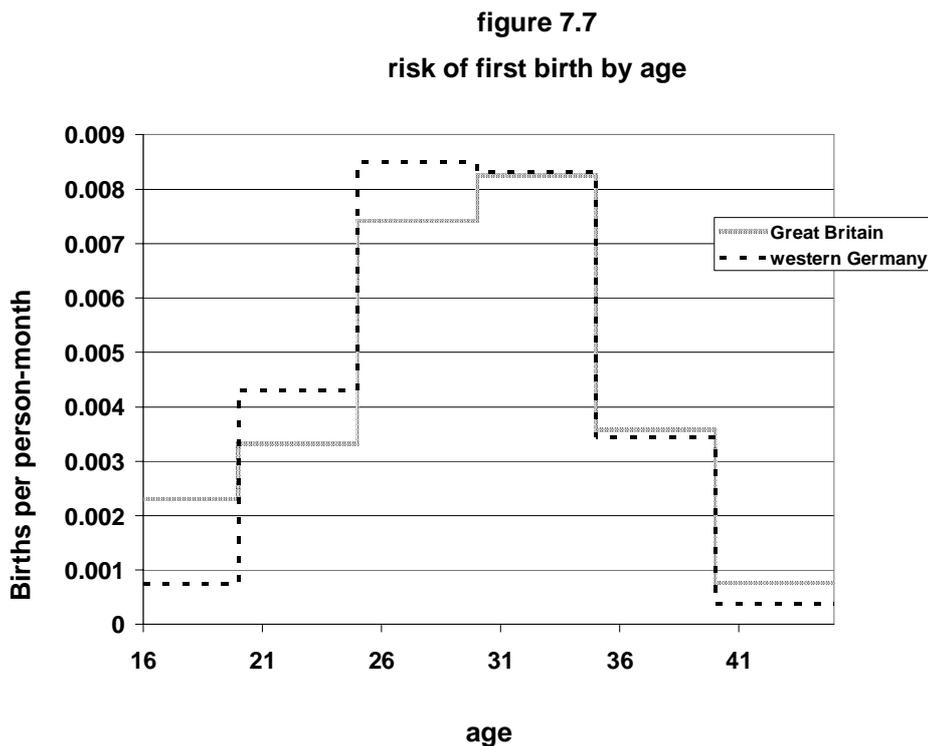
figure 7.6

Western Germany: survival curves for first birth by education cohort 1955-64



#### 7.4 Risk of first birth by age in the 1990s

As described earlier, the analysis of determinants of first birth risks in Great Britain and western Germany will focus on the 1990s. Before moving on to models testing the impact of education, labor market status, occupation and work characteristics on first birth risks, this section briefly compares first birth risks by age in the two countries without any further covariates. Figure 7.7 shows age as the baseline of a piecewise constant model for risk of first birth in the 1990s in western Germany and Great Britain. The shape of the baseline is very similar for the two countries. Between ages 20 and 30, first birth risks are somewhat higher in western Germany. Before age 20 and after age 35, they are slightly higher in Great Britain.



#### 7.5 Current education and risk of first birth

The first model shown in table 7.1 compares the effect of education in Great Britain and western Germany. In both countries, as can be expected from previous research, women still taking part in education have much lower risks of first birth. Women with

a university degree have lower risks of first birth than those with a vocational degree or no degree in both countries. However, the difference in risk of first birth between women with a university degree and those with no degree is only significant in Great Britain. A smaller effect in western Germany than in Great Britain is already indicated by smaller differences in levels of childlessness by education for cohorts 1955-64 in western Germany (figure 7.6) than in Great Britain (figure 7.4). None-the-less, effects of university education are unexpectedly small in both countries. Models interacting age and education will be discussed later in this chapter, in section 7.14, to see whether a time-squeeze may be responsible for the comparatively small effect of university education on first birth risks.

Table 7.1 further shows that there is not much difference in risks of first birth between women with vocational degrees and those without degrees. This is in contrast to the expectation that first birth risks would be higher for women without than with a vocational degree in Great Britain. Research on labor market entry by Scherer (2001) had shown that labor market prospects in Great Britain are particularly low for women without a vocational degree. Therefore, the expectation had been that for them, the opportunity costs of motherhood would be very low. However, there is no evidence of this from the models shown in table 7.1.

In model 2, partnership status as well as the partner's level of education is added. Adding partnership status renders the effect of women's education insignificant in Great Britain as well. A reason may be that partnership status is correlated to timing differences in first birth risks. It is likely that the peak in risk of first birth is later for women with university degrees than for those with lower levels of education. Women with university education will also tend to begin cohabitation and marriage later. Compared to others who also do not yet have a partner or are not married yet, first birth risks will not be that much lower for university educated women.

Neither the partner's level of education nor educational enrollment is significant in either country. The hypothesis had been that there would at least be a positive effect of the partner's education in western Germany, since labor market outcomes are more closely linked to education than in Britain. Also, the expectation had been that first birth risks would be lower for women with partners who have no degree compared to those whose partner has a vocational degree, since labor market prospects for men without vocational degrees are very low in Germany. To obtain a good job, at least some kind of vocational qualification is necessary. However, there is no effect

on first birth risks of the partner having a vocational degree as compared to no degree. If the partner has a university degree, there does seem to be a tendency towards higher first birth risks in western Germany, but the effect is not significant.

In studies of the determinants of higher order births, the partner's level of education has often been found to have a significant effect and to markedly change the effect of women's level of education when entered into the model. Apparently, it is the level of men's education that is important for the ability to support an additional child via better labor market opportunities. Couples often have similar levels of education. Thus, only including women's level of education can represent a misspecification. Kreyenfeld (2002) found a strong positive effect of the partner having a university degree on second birth risks in western Germany. Including the partner's level of education completely explained the effect of women's own level of educational attainment. A similar result was also obtained for Austria by Hoem, Prskawetz, and Neyer (2001). There, an initial small effect of women's education on third births risks could be completely explained by accounting for their partner's level of education. In contrast to these findings for higher order births, the partner's level of education does not seem to be very important for transitions to the first child in either Britain or western Germany. The lack of significance of the effect in western Germany could be related to the sample size. Even so, including the partner's level of education does not alter the effect of women's own level of education much in western Germany. Possibly, the expenses for only one child are not high enough to be reflected in effects of indirect measures of men's financial resources, such as their level of education.

**Table 7.1**  
**The effect of current educational attainment on risk of first birth<sup>27</sup>**

	Great Britain		Western Germany	
	model 1	model 2	model 1	model 2
<b>age (baseline)</b>				
16-20	0.0054	0.0044	0.0020	0.0014
20-24	0.0044	0.0018	0.0060	0.0030
25-29	0.0084	0.0019	0.0094	0.0030
30-34	0.0093	0.0019	0.0085	0.0024
35-39	0.0040	0.0008	0.0034	0.0009
40-45	0.0008	0.0002	0.0004	0.0001
<i>relative risks</i>				
<b>education</b>				
no degree	1	1	1	1
voc. degree	0.95	0.97	1.08	0.99
univ. degree	0.70 **	0.77	0.86	0.84
in education	0.13 ***	0.17 ***	0.28 ***	0.42 ***
<b>partnership status</b>				
no partner		1		1
married		9.29 ***		6.92 ***
cohabiting		3.42 ***		2.55 ***
<b>partner's education</b>				
no degree / (no partner)		1		1
voc. degree		0.93		1.06
univ. degree		1.14		1.34
in education		0.38		1.00

\*\*\*:p<0.01; \*\*:0.01≤p<0.05; \*:0.05≤p<0.1

<sup>27</sup> Table 7.1 shows a model including the partner's level of educational attainment. Of course, this variable cannot have a meaningful value for women who do not have a partner. Women who do not have a partner have to arbitrarily be assigned a value for this variable. For the results, it does not matter which value they are assigned. Here, in order to make the interpretation of the estimates easier, they were assigned the value for having a partner without a degree. A more elegant solution would have been to estimate an interaction effect between partnership status and the partner's degree of education. This would have avoided creating a systematic pattern of zero exposures (Hoem 2000). Presenting estimates of interaction effects for this and each of the following models would have been very space-consuming though. In later models, it would have often involved three-way interactions. This would also have been likely to exceed the limits set by sample size. The table below gives estimates for a model interacting partnership status and the partner's level of education (for Great Britain). The figures without parentheses are the estimates for this interaction model. The figures in parentheses are the corresponding figures calculated from the model estimates shown in table 7.1. To make them comparable to the estimates from the interaction model, the reference category for the figures in parentheses (giving the results of the model estimated for table 7.1) was changed to being married to a partner with no degree, and the figures for each category were calculated by multiplying the corresponding estimates from table 7.1 for the effect of partnership status and the partner's level of education. As one can see by comparing the figures inside and outside parentheses, differences in the results of the two models are not very large.

partner's ed.:		no degree	voc. degree	univ. degree	in ed.
no partner	0.12*** (0.11)				
married		1	1.04 (0.93)	1.33 (1.14)	n.e. (0.38)
cohabiting		0.49*** (0.37)	0.34*** (0.34)	0.31*** (0.42)	0.32 (0.14)

## 7.6 The partner's level of education and the business cycle

A further hypothesis with respect to men's educational attainment was that it would have a stronger effect at the beginning than at the end of the 1990s in Great Britain, and vice versa in western Germany. Unemployment was particularly high in Great Britain between 1992 and 1994. Having a high level of training might have been especially important to avoid the risk of unemployment and to feel secure enough to support a family. Indeed, between 1992 and 1994, there was a more pronounced positive effect of men's education than at any other time in the 1990s, as can be seen in table 7.2. In 1996-97, by contrast, there was more of a U-shaped effect of men's education, with the highest risks of first birth for women whose partner had no vocational degree. In western Germany, the pattern does not fit the hypothesis as well. Unemployment was quite high at the end of the 1990s in western Germany, and low at the beginning of the 1990s. First birth risks are higher in 1998-2000 for women whose partner has a university degree than for those where the partner has a vocational degree. However, if the partner has no degree, they are almost just as high. Also, at the beginning of the 1990s, there are positive effects of education as well, although unemployment rates at this time were comparatively low. Perhaps the partner's labor market chances are more important in Great Britain than in western Germany for first birth decisions, because of lower levels of transfers and lower degrees of employment protection.

**Table 7.2**  
**Interaction between the partner's education and calendar time**

	Great Britain	Western Germany
<b>age (baseline)</b>		
16-19	0.0043	0.0014
20-24	0.0019	0.0030
25-29	0.0019	0.0030
30-34	0.0019	0.0024
35-39	0.0008	0.0008
40-45	0.0002	0.0001
<i>relative risks</i>		
<b>education</b>		
no degree	1	1
voc. degree	0.97	0.99
univ. degree	0.75	0.85
in education	0.17 ***	0.41 ***
<b>partnership status</b>		
no partner	1	1
married	6.65 ***	7.08 ***
cohabiting	2.43 ***	2.57 ***
<b>interaction: partner's education/ calendar time</b>		
<i>1990-91</i>		
no degree	1.12	0.72
voc. degree	1.64	1.04
univ. degree	1.14	1.96
<i>1992-93</i>		
no degree	1.05	0.83
voc. degree	1.33	1.16
univ. degree	2.35 ***	1.35
<i>1994-95</i>		
no degree	1.50	0.93
voc. degree	1.14	0.91
univ. degree	1.34	1.14
<i>1996-97</i>		
no degree	1.90 **	0.67
voc. degree / (no partner) <sup>28</sup>	1	1
univ. degree	1.47	0.65
<i>1998-2000</i>		
no degree	1.54	1.62
voc. degree	1.52	1.10
univ. degree	1.41	1.79 **

\*\*\*:  $p < 0.01$ ; \*\*:  $0.01 \leq p < 0.05$ ; \*:  $0.05 \leq p < 0.1$

<sup>28</sup> See footnote 26.

## 7.7 Employment status and risk of first birth

Table 7.3 shows effects of men's and women's employment status on first birth risks. A first hypothesis had been that working part-time would have a positive effect on first birth risks for women, because opportunity costs would be lower. Especially in Great Britain, part-time jobs tend to be very low quality jobs (Robson et al. 1999; Black et al. 1999, Rubery and Fagan 1996). However, there is no evidence of an effect of part-time work on first birth risks in Great Britain. In Germany, working part-time does have a significant positive effect on first birth risks for women. However, this effect no longer holds when controlling for partnership status. Apparently, working part-time is strongly linked to being in a partnership. Unemployment, by contrast, has a strong positive effect on first birth risks for women in Great Britain. This corresponds to the effect found by Francesconi and Golsch (2005). However, in contrast to Francesconi and Golsch (2005), I do not find any effect of being outside the labor market.

A further expectation had been that the partner's unemployment would have a negative effect in both countries, and that the negative effect would be stronger in Great Britain. This was expected because in Britain, only flat rate unemployment benefits are paid, making it even harder to support a family. However, there was no effect of men's unemployment in either country. Also, it was hypothesized that first birth risks would be lower if the partner is employed part-time. This is because part-time jobs are usually badly paid and do not provide very good career prospects. In Great Britain, however, there was no effect of the partner's part-time work on first birth risks. This is in contrast to what had been expected, because part-time work has been rising among male labor market entrants in Great Britain and appears to represent a new type of marginalized employment. It was expected that men working in these types of employment arrangements would be particularly unlikely to become fathers. In any case, these models are essentially models of women's first birth risks; information for men is only included if they are the partner of a woman in the sample. Possibly, men with very low labor market prospects are less likely to even be in a partnership. In western Germany, on the other hand, it was not possible to estimate an effect of part-time work for men. This is because there was not a single first birth among women whose partner was employed part-time. In a sense, then, it does seem

that there is a negative effect of men's part-time work in western Germany. From this data, however, it is not possible to obtain an estimate.

**Table 7.3**  
**The effect of employment status on risk of first birth**

<b>age (baseline)</b>	<b>Great Britain</b>		<b>Western Germany</b>	
	<b>model 1</b>	<b>model 2</b>	<b>model 1</b>	<b>model 2</b>
16-19	0.0047	0.0037	0.0021	0.0014
20-24	0.0040	0.0017	0.0059	0.0029
25-29	0.0080	0.0018	0.0093	0.0030
30-34	0.0091	0.0018	0.0084	0.0024
35-39	0.0038	0.0008	0.0033	0.0009
40-45	0.0008	0.0002	0.0004	0.0001
<i>relative risks</i>				
<b>education</b>				
no degree	1	1	1	1
voc. degree	0.97	1.02	1.06	0.98
univ. degree	0.72 *	0.80	0.83	0.83
in education	0.14 ***	0.20 ***	0.28 ***	0.42 ***
<b>employment status</b>				
full-time	1	1	1	1
part-time	0.84	0.77	1.43 **	1.07
unemployed	1.85 ***	2.01 ***	1.15	1.36
not employed	1.30	1.41	0.71	0.69
<b>partnership status</b>				
no partner		1		1
married		9.13 ***		7.01 ***
cohabiting		3.32 ***		2.56 ***
<b>partner's education</b>				
no degree / (no partner) <sup>29</sup>		1		1
voc. degree		0.97		1.06
univ. degree		1.18		1.33
in education		0.39		0.99
<b>partner's employment status</b>				
full-time / (no partner)		1		1
part-time		0.73		-
unemployed		1.17		0.78
not employed		0.78		1.52

\*\*\*:p<0.01; \*\*:0.01≤p<0.05; \*:0.05≤p<0.1

<sup>29</sup> See footnote 26. Women with no partner were arbitrarily assigned the value for having a partner with no degree. This does not imply that the estimates for the effect of the partner's level of education give risks relative to having no partner. To obtain the risk of first birth for a woman who is married to a partner with a university degree relative to a woman with no partner, one needs to multiply the estimate for being married with the estimate for the partner having a university degree. In the model for Great Britain, this would be: 9.13\*1.18=10.77.

## 7.8 Firm size, sector and self-employment

There is evidence that the provision of family-friendly work arrangements for parents, such as part-time work or flexible work schedules, is positively correlated with firm size and public sector employment in Great Britain. The corresponding hypothesis had therefore been that women working in large firms or in the public sector would be less likely to postpone the decision to have a first child. Correlations between firm size or sector and family-friendly work arrangements are less well documented for western Germany. It is likely, though, that larger firms and public sector employers in western Germany will have more resources and longer planning horizons as well, which better allow them to provide family-friendly arrangements than smaller firms or private sector employers. In Britain, however, it is also common for employers to provide supplementary maternity leave, since statutory requirements are only very limited. In Germany, by contrast, legal regulations are very extensive, so that supplementary leave is not usually an issue. If large firms and public sector employers are better able to grant supplementary leave in Great Britain, this may lead to a stronger effect of firm size and sector than in Germany. Model 1 in table 7.4 shows that firm size has a straight-forward positive effect on first birth risks in Great Britain, in line with the hypothesis. The sector of employment, by contrast, has no effect. In western Germany, the effect of firm size is very different than what was expected. There appears to be a negative effect of working in a medium size firm on first birth risks. This effect is very difficult to explain. It is not apparent why working conditions in medium size firms should be less compatible with parenthood than those in small firms, for instance. With respect to sector of employment, as in Britain, there is no effect of being a public sector employee on first birth risks, in contrast to what one might expect.

The great majority of self-employed women in both countries have very small firms with less than 4 employees. The total case numbers of women working in very small firms, as well as of the self-employed, are very low, making it difficult to estimate separate effects of being self-employed and of working in very small firms. Therefore, model 2 in table 7.4 only includes a variable for being self-employed and not for firm size. Model 2 indicates that being self-employed has a negative effect on

first birth risks in both countries, but the effect is not significant, possibly because of the small case numbers.

**Table 7.4**  
**Firm size, sector, self-employment and risk of first birth**

<i>age (baseline)</i>	<b>Great Britain</b>		<b>Western Germany</b>	
	<b>model 1</b>	<b>model 2</b>	<b>model 1</b>	<b>model 2</b>
16-19	0.0054	0.0047	0.0021	0.0021
20-24	0.0046	0.0040	0.0062	0.0059
25-29	0.0092	0.0081	0.0096	0.0093
30-34	0.0105	0.0092	0.0087	0.0084
35-39	0.0044	0.0039	0.0034	0.0034
40-45	0.0009	0.0008	0.0004	0.0004
<i>relative risks</i>				
<b>education</b>				
no degree	1	1	1	1
voc. degree	0.98	0.98	1.06	1.06
univ. degree	0.73 *	0.72 *	0.85	0.84
in education	0.12 ***	0.14 ***	0.27 ***	0.28 ***
<b>employment status</b>				
full-time	1	1	1	1
part-time	0.88	0.84	1.38 *	1.43 **
unemployed	1.59 **	1.83 ***	1.11	1.14
not employed	1.12	1.28	0.69	0.71
<b>firm size</b>				
very small	0.62 *		1.08	
small	0.82		1.11	
medium	0.88		0.78 *	
large / (non-employed) <sup>30</sup>	1		1	
<b>sector</b>				
public sector	0.93		1.01	
private sector / (non-employed)	1		1	
<b>self-employment</b>				
employee / (non-employed)		1		1
self-employed		0.63		0.70

\*\*\*:  $p < 0.01$ ; \*\*:  $0.01 \leq p < 0.05$ ; \*:  $0.05 \leq p < 0.1$

### **7.9 Interaction between the partner's self-employment and vocational qualification**

A greater proportion of men than women were self-employed in both Great Britain and western Germany during the 1990s. Especially in Great Britain, quite a large pro-

<sup>30</sup> See footnotes 26 and 28.

portion, up to 17%, of male labor force participants were self-employed during this time. For Great Britain, there is some evidence that among labor market entrants, men with low levels of education are overrepresented among the self-employed (Scherer 2001). However, one might assume that self-employed men with and without vocational qualifications have strongly diverging levels of economic security and thus perceive their ability to support a family very differently. Self-employed men with vocational qualifications may have very good economic prospects, while those without degrees may perceive a high level of economic insecurity. To see whether the partner having a formal qualification had any effect on first birth risks for women whose partner was self-employed, a model testing for an interaction effect between the partner's self-employment and vocational training was estimated. Table 7.5 shows that first birth risks were significantly higher for women in Great Britain whose partner was both self-employed and had a vocational qualification than for women whose partner had a vocational qualification but was an employee. There was practically no difference in first birth risks between women whose partners were employees with a vocational qualification, employees without a vocational qualification, or self-employed without a vocational qualification. This partly supports the hypothesis in that women whose partners are self-employed and have a vocational degree have exceptionally high first birth risks. However, it was not the case that the partner being self-employed without a vocational degree led to exceptionally low first birth risks.

For western Germany, the results shown in table 7.5 indicate that the partner being self-employed with a degree has a similar positive effect as in Britain, but in Germany, the effect is not significant. On the other hand, in western Germany, there is a significant negative effect of the partner being self-employed without a degree. However, the group of women whose partner is self-employed but has no degree is quite small in western Germany.

**Table 7.5**  
**Men's self-employment and vocational degree**

	Great Britain	Western Germany
<b>age (baseline)</b>		
16-19	0.0036	0.0014
20-24	0.0016	0.0028
25-29	0.0017	0.0029
30-34	0.0017	0.0023
35-39	0.0007	0.0008
40-45	0.0001	0.0001
<i>relative risks</i>		
<b>education</b>		
no degree	1	1
voc. degree	1.03	0.99
univ. degree	0.86	0.94
in education	0.20 ***	0.44 ***
<b>employment status</b>		
full-time	1	1
part-time	0.77	1.01
unemployed	2.04 ***	1.35
not employed	1.42	0.69
<b>partnership status</b>		
no partner	1	1
married	8.95 ***	7.50 ***
cohabiting	3.23 ***	2.77 ***
<b>partner's employment status</b>		
full-time / (no partner)	1	1
part-time	0.66	
unemployed	1.21	0.78
not employed	0.80	1.55
in education	0.40	0.92
<b>interaction: partner's self-employment/ education</b>		
self-employed without degree	0.99	0.31 *
self-employed with degree	1.51 **	1.47
employee without degree	1.02	0.96
employee with degree / (no partner/ partner non-employed) <sup>31</sup>	1	1

\*\*\*:p<0.01; \*\*:0.01≤p<0.05; \*:0.05≤p<0.1

<sup>31</sup> See footnotes 26 and 28. In the model for Great Britain, the risk of first birth for a woman married to a partner who is self-employed with a degree and working part-time relative to a woman without a partner is  $8.95 \times 0.66 \times 1.51 = 8.92$ . The risk of first birth for a woman with a partner who is self-employed with a degree relative to a woman with a partner who is an employee with a degree is 1.51. The risk of first birth for a woman with a partner who is self-employed without a degree relative to a woman whose partner is unemployed is  $0.99/1.21 = 0.82$ .

### 7.10 Total work hours per week and risk of first birth

The total amount of hours that men and women work per week may have an effect on their decision of whether to have a child. Given the traditional division of labor, if women work very long hours, they may feel that caring for a child is not compatible with their work schedule. This might particularly apply to Great Britain, where a discernible proportion of women return to full-time work quite quickly. In western Germany, the compatibility of long work hours with bringing up small children is likely to be less relevant, since durations of parental leave and part-time work are very long. Again under the assumption of a traditional division of labor, working long hours may have a positive effect on men's decisions to become fathers, if long work weeks are connected to good career prospects. Table 7.6 shows first one model for women's total work hours only, and a second model including both men's and women's total hours worked per week. There are no significant effects of women's work hours in Great Britain. For western Germany, by contrast, significantly higher first birth risks are found for women working 20-29 hours a week than for those working a standard amount of 30-40 hours. Those working more than 40 hours have lower first birth risks. This is especially the case for those working only slightly more than 40 hours, that is, 41-49 hours. The difference in first birth risks for this group compared to those working 30-40 hours is found to be significant. First birth risks for women working over 50 hours are again quite similar to those for women working a standard work week of 30-40 hours. Like earlier in the model shown in table 7.3 that only generally tested for employment status, the positive effect of part-time work disappears when controlling for partnership status. Differently than the model shown earlier though, this model makes clear that the positive effect of working part-time applies in the main to women working only slightly less than full-time hours, that is, 20-29 hours per week.

It is surprising that there is a negative effect of long work hours in western Germany, but not in Great Britain, since compatibility considerations should be more important for women in Britain. To look into the effect of work hours more closely, they were interacted with occupation (not shown). It was found that long work hours had a positive effect for women in professional occupations in both countries. As discussed earlier though, women with a high degree of education, who almost exclusively compose the group of professionals, are the quickest to return to work. This

does not provide much support for the incompatibility argument. There were no positive effects of working long hours for any other occupation in Germany. In Great Britain, by contrast, the effect of working long hours was positive for several other occupations as well. An explanation may be that the negative effect of work hours in western Germany is not related to compatibility problems, but to opportunity costs for those who do not return to employment quickly. If the number of hours worked per week is correlated with career resources, taking long times of leave may involve high opportunity costs for those working long hours. Some women who work long hours may also belong to a special group having a particular need for the extra income from working overtime. To summarize, it does not seem that compatibility problems are the reason for a negative effect of long work hours on first birth risks. There is no negative effect in Great Britain, where compatibility problems should be more relevant. There is also no negative effect in either country for women working as professionals, the group that usually returns to employment the quickest and would therefore most likely be faced by compatibility problems. Instead, opportunity costs from long times of absence may be the reason for the negative effect in western Germany.

The measure of hours worked per week is less precise for Great Britain. The measure for Great Britain is the sum of overtime and the amount of hours excluding overtime that respondents said they were expected to work each week. The problem is, though, that it is of course possible that respondents in reality work less than the expected number of hours per week. This cannot be taken account of. For Germany, by contrast, a more precise measure is available and was made use of for the models presented in table 7.6. Respondents were asked for the exact number of hours they actually worked. A measure similar to the one for Great Britain was constructed for western Germany as well (results not shown) in order to see whether this would lead to similarly weak effects as those that were found for Great Britain. The positive effect of part-time work held using this alternative measure, but the effect of working long hours was no longer significant. The effect of working 41-49 hours was somewhat weaker, while the effect of working 50-59 hours was stronger in magnitude than before, but still not significant. Although the effects for long hours were not significant, they were still larger in magnitude than for Great Britain. Thus, the difference in effects between western Germany and Great Britain may partly, but not wholly, have to do with a difference in the quality of measures.

For men, significant positive effects of working very long hours, over 60 hours a week, were found in both countries. Possibly, working very long hours indeed has to do with good career prospects, facilitating the decision to have a child. Working part-time, on the other hand, appears to have a negative effect on decisions to have a first child for men in both countries. This was expected, since part-time jobs are usually less well paid and provide fewer possibilities for advancement. The number of men working part-time was too small to be further subdivided into categories of hours worked. Using the measure of actual hours worked, this time, in contrast to the model just testing the effect of employment status (in table 7.3), there actually were first births among women whose partner worked part-time in western Germany. Therefore, it was possible to estimate an effect of part-time work for men, which turned out to be significantly negative. Interestingly, in western Germany, the effect of men's university education increases and becomes significant after controlling for hours worked. Men with a university degree are strongly overrepresented in the group working 50-59 hours. There seems to be a slight negative effect of working long hours at this level for men in Germany. This could explain why having a university degree had previously not been significant. Men with a university degree are also overrepresented among male part-time employees; this group is however altogether very small.

**Table 7.6**  
**Effect of total hours of work on first birth risks**

<b>age (baseline)</b>	<b>Great Britain</b>		<b>Western Germany</b>	
	<b>model 1</b>	<b>model 2</b>	<b>model 1</b>	<b>model 2</b>
16-19	0.0047	0.0038	0.0023	0.0015
20-24	0.0040	0.0017	0.0066	0.0032
25-29	0.0081	0.0018	0.0103	0.0033
30-34	0.0091	0.0018	0.0093	0.0026
35-39	0.0039	0.0008	0.0037	0.0010
40-45	0.0008	0.0002	0.0004	0.0001
<i>relative risks</i>				
<b>education</b>				
no degree	1	1	1	1
voc. degree	0.97	1.01	1.06	0.98
univ. degree	0.72 *	0.83	0.83	0.84
in education	0.14 ***	0.19 ***	0.25 ***	0.38 ***
<b>employment status</b>				
employed	1	1	1	1
unemployed	1.84 ***	2.00 ***	1.03	1.23
not employed	1.29	1.37	0.64	0.61 *
<b>work hours</b>				
1-9	0.47	0.52	0.72	0.88
10-19	0.86	0.71	1.66	1.07
20-29	0.84	0.80	1.85 ***	1.48
30-40 / (non-empl.) <sup>32</sup>	1	1	1	1
41-49	1.01	0.94	0.68 ***	0.68 ***
50-59	0.92	0.87	0.84	0.92
60+	0.84	0.79	1.07	0.92
<b>partnership status</b>				
no partner		1		1
married		7.90 ***		6.25 ***
cohabiting		2.85 ***		2.32 ***
<b>partner's education</b>				
no degree / (no partner)		1		1
voc. degree		0.99		1.10
univ. degree		1.19		1.50 *
in education		0.45		1.12
<b>partner's employment status</b>				
employed / (no partner)		1		1
unemployed		1.34		0.85
not employed		0.90		1.63
<b>partner's work hours</b>				
1-29		0.37		0.15 *
30-40 / (no partner / partner non-empl.)		1		1
41-49		1.21		1.22
50-59		1.18		0.93
60+		1.60 **		1.46 *

\*\*\*:p<0.01; \*\*:0.01≤p<0.05; \*:0.05≤p<0.1

<sup>32</sup> See footnotes 26, 28, and 30.

## 7.11 Occupation and risk of first birth

Table 7.7 shows estimates for models testing effects of men's and women's occupation on first birth risks. These models do not include controls for the level of education, because there is not much overlap of occupational groups between people with different levels of education attainment.

Women working in occupations that require higher levels of qualification have been found to have better access to family-friendly arrangements, such as part-time work or flexible work schedules. However, they may be less willing to take advantage of these types of arrangements out of fear of losing employment opportunities and of not meeting role expectations. Therefore, it was expected that women working as professionals would have lower first birth risks than those working as technicians, clerks, service workers, or in manual occupations. For several countries though, empirical studies have found higher first birth risks for teachers than other professionals. This may be due to more social support for mothers in this profession, since it is more female dominated. Model 1 in table 7.7 shows that in Great Britain, first birth risks for professionals are indeed lower than those for clerks, service, or manual workers. The difference to clerks and service workers, though, is not significant. In western Germany, like in Great Britain, first birth risks for professionals are lower than for service or manual workers. In contrast to Great Britain, professionals do not have lower first birth risks than clerks though. First birth risks for teachers are slightly higher than those for other professionals in both countries, but the difference is too small to be significant. In both countries, the majority of managers have vocational, not university degrees. Non-the-less, they have the lowest first birth risks of all in Great Britain. In Germany, however, first birth risks for managers are somewhat higher than for professionals.

Clerks represent a large proportion of female workers with vocational degrees in both countries, especially in Great Britain. It is interesting that they belong to the group of occupations with comparatively low first birth risks in western Germany, but to the group with comparatively high first birth risks in Great Britain.

In neither country do technicians and associate professionals, another relatively large group of female workers predominantly possessing vocational degrees, have much higher first birth risks than professionals, the largest group of women with

university degrees. Thus, occupations typically requiring vocational degrees do not generally seem to be associated with higher first birth risks. This only seems to be the case for clerks in Great Britain and manual occupations in both countries, in which few women are employed however. I had expected nurses and health assistants to have higher first birth risks than other technicians and associate professionals, of which they are a subgroup. Health occupations are usually more female dominated than other technical and associate professional occupations. However, first birth risks are not higher for nurses and health assistants either.

Contrary to what one might expect, the majority of service and sales workers have vocational degrees in both countries. First birth risks are higher in this group than in other occupational groups with high proportions of employees having vocational degrees. It is likely that perspectives for job development among service or sales workers are not very promising. Although many of them have a vocational degree, they may deem their opportunity costs of giving up their job to be quite low.

The proportions of women with no degree are highest among machine operators and assemblers and in elementary occupations in both countries. It has been found that in contrast to men, the majority of women working in manual occupations earn very low wages (Robson et al. 1999). Machine operators and assemblers have by far the highest first birth risks in western Germany, though their group is quite small.

The hypothesis for men had been that being a professional or manager would have a positive effect on first birth risks. This is because men in these occupations are likely to earn the highest incomes, have the most secure jobs, and the best employment prospects. Looking at model 2 in table 7.7, women with partners working as professionals do seem to have relatively high first birth risks. However, first birth risks for women whose partners are professionals are not much different than those for women whose partners are technicians, associate professionals, or clerks. Having a partner who is a manager does not appear to have as much of a positive effect on first birth risks. The reason may be that the category for managers is a very broad category. Most managers have vocational, but not university degrees. Even among service sector occupations requiring vocational degrees though, being a manager has somewhat of a negative effect for men. While the effect is not significant, in both countries, women whose partners are managers have somewhat lower risks of transition to motherhood than those whose partners are clerks, although they have about the same level of vocational qualification.

Much of the positive effect of being a clerk on first birth risks for women in Great Britain can be explained by the partner's occupation. Contrary to what was expected, being a clerk has a stronger positive effect for men than for women. Many clerical occupations, for example secretarial occupations, tend to be quite female dominated. Therefore, it was expected that social support for mothers would be quite strong in these types of occupations, leading to a positive effect on first birth risks. In western Germany as well, though, first birth risks appear to be comparatively high for men, but not for women who are clerks.

The partner being a teacher appears to have a very strong negative effect on first birth risks in western Germany. However, the number of men who are teachers in this sample is very small, and the effect is not significant. Controlling for the partner's occupation strongly raises the positive effect of being a teacher for women. This also holds in models where men who are teachers are grouped together with other professionals.

There is some difference between the two countries in the effect of having a partner who is employed in crafts occupations. The partner being a crafts worker leads to comparatively low first birth risks in Great Britain, while this is not the case in western Germany. It is possible that working conditions and perhaps levels of pay are very different for these occupations in the two countries. This is indicated by a higher proportion of crafts workers having vocational degrees in Germany than in Great Britain. A very large proportion of men in both countries work in this type of occupation, but the proportion is yet somewhat higher in western Germany. The hypothesis had actually been that having a partner employed in a crafts occupation would have a positive effect on first birth risks, since crafts occupations generally require a relatively high level of skills and qualifications. In Britain, in any case, the results do not fit the hypothesis.

Differences in the impact of the partner being a crafts worker between the two countries can also be seen if one compares first birth risks of women whose partners are crafts workers to those of women whose partners are machine operators and assemblers. Both crafts work and machine operation and assembling are manual occupations. However, in contrast to western Germany, there is a noticeable difference in first birth risks for women whose partners are machine operators and assemblers compared to those whose partners are crafts workers in Great Britain. This could be a

result of differences in level of pay and unionization between the two occupational groups in Great Britain.

As hypothesized though, the partner working in an unskilled occupation has a negative effect on first birth risks in both countries. This is most probably due to low levels of pay and employment security. It has been shown that men working in unskilled occupations have very low levels of income in Great Britain, and very high risks of unemployment in western Germany (Robson et al. 1999; McGinnity and Hillmert 2004).

To summarize then, women working as professionals do not have much lower first birth risks than others working in the service sector in either country. One explanation may be a time-squeeze among university educated women. Among women in service sector occupations typically requiring vocational degrees, those working in service and sales occupations seem to have the highest first birth risks in both countries. They are higher than those for women working in clerical, technical and associate professional, or managerial occupations. Of women working in the service sector in Britain, managers have the lowest first birth risks, although their average level of vocational qualification is lower than for professionals. Working in typically female dominated occupations, for example as a teacher, a nurse, or a clerk, does not seem to have a very strong effect on first birth risks in either country. After controlling for the partner's occupation though, in western Germany, teachers turn out to have much higher first birth risks than other women working in the service sector. Before controlling for the partner's occupation, women working as clerks in Britain have higher first birth risks than other service sector employees. Not many women work in manual occupations in either country, but those that do tend to have higher first birth risks than those working in the service sector. For men, working in particular manufacturing occupations lowers first birth risks compared to other occupations. In both countries, if the partner works in an elementary occupation, this strongly lowers first birth risks. In Britain, but not in western Germany, having a partner employed in a crafts occupation also lowers first birth risks. In western Germany, first birth risks are somewhat higher for women whose partners are professionals than for those whose partners are managers. In models where professionals are the reference category though, the difference is not significant.

Table 7.7

## Effect of occupation on first birth risks

age (baseline)	Great Britain		Western Germany	
	model 1	model 2	model 1	model 2
16-19	0.0050	0.0036	0.0018	0.0011
20-24	0.0042	0.0017	0.0051	0.0023
25-29	0.0083	0.0017	0.0083	0.0024
30-34	0.0095	0.0018	0.0073	0.0019
35-39	0.0041	0.0008	0.0030	0.0007
40-45	0.0008	0.0002	0.0003	0.0001
<i>relative risks</i>				
<b>employment status</b>				
full-time	1	1	1	1
part-time	0.80	0.70	1.37 *	1.11
unemployed	1.70 ***	2.05 ***	1.33	1.60 **
not employed	1.21	1.39	0.82	0.82
in education	0.13 ***	0.20 ***	0.32 ***	0.53 ***
<b>occupation</b>				
managers, leg., s.off.	0.70 *	0.76	1.28	1.17
professionals	0.78	0.95	1.06	1.19
teachers	0.88	0.95	1.32	1.81 *
techn., ass. professionals	0.81	0.86	1.15	1.14
nurses, health ass., social workers	0.78	0.97	0.84	1.00
clerks / (non-empl.) <sup>33</sup>	1	1	1	1
service, sales workers	1.01	1.26	1.44 **	1.30
craft workers	1.21	1.43	1.68 **	1.81 **
operators, assemblers	0.94	0.98	2.08 ***	2.26 ***
elementary occ.	0.90	1.18	1.11	1.10
others	0.38	0.61	0.82	0.88
<b>partnership status</b>				
no partner		1		1
married		11.17 ***		8.00 ***
cohabiting		4.14 ***		2.92 ***
<b>partner's employment status</b>				
employed (no partner)		1		1
unemployed		0.98		0.73
not employed		0.62		1.50
in education		0.31		0.89
<b>partner's occupation</b>				
managers, leg., s.off.		0.85		0.80
professionals		0.90		1.17
teachers		0.65		0.19
techn., ass. professionals		0.93		1.05
clerks (no partner/ partner non-empl.)		1		1
service, sales workers		0.65		0.91
craft workers		0.65 *		1.04
operators, assemblers		1.10		0.91
elementary occ.		0.40 **		0.32 *
others		0.68		0.73

\*\*\*:  $p < 0.01$ ; \*\*:  $0.01 \leq p < 0.05$ ; \*:  $0.05 \leq p < 0.1$

<sup>33</sup> See footnotes 26, 28, and 30.

## 7.12 Earnings and first birth risks

With respect to the effect of earnings on first birth risks, the hypotheses had been that there would be a negative effect of women's earnings in western Germany and a U-shaped effect in Britain. For men the expectation was that there would be a positive effect in both countries, but that this effect would be stronger in Britain. These effects of earnings were anticipated because of a poor childcare infrastructure and traditional role expectations in both countries. A U-shaped effect of women's earnings was however hypothesized for Great Britain because making use of purchased childcare, albeit costly, is socially better accepted than in western Germany. Men's earnings quintile was expected to have a stronger positive effect in Britain than in Germany because of greater earnings inequality and less public transfers. Having earnings near the lower end of the income distribution was expected to have a stronger negative effect because of higher levels of poverty.

The results shown in table 7.8 give some indication of a U-shaped effect of income for women in both countries. This effect is however clearer in western Germany than in Great Britain. In western Germany, first birth risks are highest for women with earnings in the first and fifth quintile. First birth risks are lowest for women with earnings in the third quintile. In Great Britain by contrast, lowest first birth risks are found for women in the fourth earnings quintile, while those in the third quintile are slightly higher than in the 2<sup>nd</sup> quintile. So, maybe one could describe the pattern for Britain as a doubled U-shaped effect.

In both countries, before controlling for the partner's earnings, first birth risks are basically equal for women with earnings in the first and fifth quintiles. Controlling for the partner's earnings however leads to a small, though insignificant, negative effect of having earnings in the fifth rather than the first quintile. In Great Britain, this does not affect the difference in first birth risks between the fourth and the fifth quintile though. Differences between the 2<sup>nd</sup> and the 3<sup>rd</sup> quintile in Great Britain are however flattened out by controlling for the partner's earnings. In both countries, controlling for the partner's earnings leads to slightly stronger negative effect of having earnings in any other than the lowest quintile.

The partner's earnings generally have a positive effect on first birth risks in both countries. However, in western Germany, the lowest first birth risks are found for women whose partner has earnings in the 2<sup>nd</sup> quintile, leading to a very lop-sided U-shaped effect.

The hypothesis that there would be a U-shaped effect of women's earnings in Great Britain is thus partially supported. However, the hypothesis of a straightforward negative effect of women's earnings in western Germany is not supported. By contrast, there is a clearer U-shaped effect in western Germany than in Great Britain. This seems to indicate that women with high earnings in western Germany, despite low levels of social acceptance of childcare, do feel confident of finding a way to return to work after having children. Perhaps this is due to long leave periods and better possibilities to work part-time under relatively good conditions. In Great Britain, on the other hand, part-time jobs seem to be restricted largely to low-paid service work.

Differences in the effects of one's position in the income distribution on first birth risks between the two countries may also result from differences in absolute levels of income in each quintile. In absolute terms, the quintile borders are all about 15% to 30% lower in Great Britain than in western Germany for both men and women. Only the borders to the highest quintile are approximately equal for both men and women between the two countries. Especially those belonging to the first quintile have substantially lower earnings in absolute terms in Great Britain than in western Germany. This could be one explanation why first birth risks are so low for women whose partners have earnings in the first quintile compared to the other quintiles in Great Britain. In western Germany, though, it is not quite as clear why the partner having earnings belonging to the second quintile leads to lower first birth risks than for those with earnings in the first quintile. Generally, though, there is support for the hypothesis that the partner's earnings have a positive effect on first birth risks in both countries. Considerations in terms of the traditional male-breadwinner role may thus still be playing a part in fertility decision-making.

**Table 7.8**  
**Effect of earnings on first birth risks**

<b>age (baseline)</b>	<b>Great Britain</b>		<b>Western Germany</b>	
	<b>model 1</b>	<b>model 2</b>	<b>model 1</b>	<b>model 2</b>
16-19	0.0049	0.0043	0.0023	0.0016
20-24	0.0042	0.0021	0.0066	0.0034
25-29	0.0083	0.0022	0.0107	0.0036
30-34	0.0094	0.0022	0.0094	0.0027
35-39	0.0040	0.0010	0.0037	0.0010
40-45	0.0008	0.0002	0.0004	0.0001
<i>relative risks</i>				
<b>education</b>				
no degree	1	1	1	1
voc. degree	0.96	0.99	1.07	1.01
univ. degree	0.73 *	0.81	0.79	0.81
in education	0.13 ***	0.16 ***	0.25 ***	0.36 ***
<b>employment status</b>				
full-time	1	1	1	1
part-time	0.84	0.67 *	1.29	0.89
unemployed	1.79 ***	1.65 **	1.01	1.14
not employed	1.25	1.16	0.63	0.57 *
<b>earnings</b>				
1. quintile / (non-empl.) <sup>34</sup>	1	1	1	1
2. quintile	0.95	0.81	0.83	0.79
3. quintile	1.15	0.87	0.73	0.71 *
4. quintile	0.83	0.63 **	0.81	0.77
5. quintile	1.00	0.77	0.98	0.89
<b>partnership status</b>				
no partner		1		1
married		6.72 ***		7.12 ***
cohabiting		2.49 ***		2.60 ***
<b>partner's education</b>				
no degree/ (no partner)		1		1
voc. degree		0.98		1.13
univ. degree		1.06		1.27
in education		0.54		1.02
<b>partner's employment status</b>				
employed / (no partner)		1		1
unemployed		1.62		0.76
not employed		1.05		1.51
<b>partner's earnings</b>				
1. quintile (no partner/ partner non-empl.)		1		1
2. quintile		1.36		0.69 *
3. quintile		1.35		1.04
4. quintile		1.62 **		0.98
5. quintile		1.92 ***		1.23

\*\*\*:  $p < 0.01$ ; \*\*:  $0.01 \leq p < 0.05$ ; \*:  $0.05 \leq p < 0.1$

<sup>34</sup> See footnotes 26, 28, and 30.

### 7.13 Work hours, earnings, firm size, and risk of first birth

Finally, table 7.9 shows results of a model including firm size, work hours, and level of earnings. Since firm size, work hours, and earnings were found to be significant in previous models, it will be interesting to see whether all of these effects also hold in a combined model. To begin with, working a relatively long week of 41-49 hours still has a negative effect on first birth risks for women in western Germany in the model shown in table 7.9. It is not so surprising that controlling for income could not explain the effect of long hours, since income did not have a straightforward negative effect, but more of a U-shaped effect in western Germany. By contrast, working in a medium size firm no longer has a significant negative effect in western Germany, though the magnitude of the effect did not change much. The positive effect of firm size in Great Britain on the other hand holds and even increases slightly in this model<sup>35</sup>. The positive effect of having earnings in the lowest quintile also increases for Great Britain in this model, while the relations between the other quintiles do not change much. Working in a small firm and having low earnings are strongly correlated; however their effects on first birth risks are in opposite directions. Including them in the same model thus seems to increase each of the effects. The U-shaped effect of earning in western Germany remains in this model, but it flattens out a bit and first birth risks are no longer significantly lower in the 3<sup>rd</sup> quintile than in the 1<sup>st</sup> or 5<sup>th</sup> quintile<sup>36</sup>. Thus, it seems that work hours are more important predictors of first birth risks in western Germany than are earnings or firm size.

The effects of the partner's earnings and work hours both become somewhat weaker for Great Britain in this model that includes both variables. However, both effects are still significant. Thus, the positive effect of the partner's work hours cannot completely be explained by higher earnings. Possibly, work hours are correlated with other attributes important for fertility decision making as well, like future employment prospects. Also, the effect of earnings cannot completely be explained by longer work

---

<sup>35</sup> The partner's firm size is controlled for in this model and has the opposite effect, although it is insignificant. This however is not the main explanation for the increase in the effect of women's firm size. The increase is nearly as large in a model excluding the partner's firm size.

<sup>36</sup> First birth risks for the fifth quintile had been slightly lower than for the 1<sup>st</sup> quintile in previous models controlling for the partner's earnings. In this model however, they are slightly above those for the 1<sup>st</sup> quintile.

hours. Present earnings themselves thus seem to be important for fertility decisions. On the other hand, present earnings can also be indicative of future earnings. In western Germany, working part-time still has a significant negative effect for men. The size of the effect of working more than 60 hours a week did not change, but now is no longer significant. Thus, the effect of working long hours seems to be less stable in western Germany. The reason for this may be that the proportion, as well as the number in this data set, of men working more than 60 hours a week is a bit smaller in western Germany than in Great Britain.

The partner having earnings in the 2<sup>nd</sup> quintile is still associated with lower first birth risks than in any other quintile in western Germany. This effect has even become somewhat stronger in this model. The difference in first birth risks between the 2<sup>nd</sup> and the 5<sup>th</sup> quintile in western Germany is about the same as the difference between the 1<sup>st</sup> and the 5<sup>th</sup> quintile in Great Britain.

**Table 7.9**  
**Work hours, firm size, earnings and first birth**

<i>age (baseline)</i>	<b>Great Britain</b>	<b>Western Germany</b>
16-19	0.0055	0.0017
20-24	0.0026	0.0036
25-29	0.0028	0.0037
30-34	0.0028	0.0028
35-39	0.0012	0.0010
40-45	0.0002	0.0001
<i>relative risks</i>		
<b>education</b>		
no degree	1	1
voc. degree	1.01	1.00
univ. degree	0.82	0.80
in education	0.13 ***	0.34 ***
<b>employment status</b>		
employed	1	1
unemployed	1.30	1.11
not employed	0.88	0.54 *
<b>work hours</b>		
1-9	0.47	0.79
10-19	0.56	0.85
20-29	0.68	1.22
30-40 / (non.empl.)	1	1
41-49	0.97	0.65 ***
50-59	0.96	0.85
60+	0.91	0.79

<b>firm size</b>			
very small	0.54	**	1.08
small	0.78		1.22
medium	0.90		0.84
large / (non.empl.)	1		1
<b>earnings</b>			
1. quintile /(non.empl.)	1		1
2. quintile	0.72		0.85
3. quintile	0.76		0.77
4. quintile	0.53	***	0.86
5. quintile	0.66	*	1.08
<b>partnership status</b>			
no partner	1		1
married	6.19	***	6.64 ***
cohabiting	2.24	***	2.50 ***
<b>partner's education</b>			
no degree / (no partner)	1		1
voc. degree	1.01		1.15
univ. degree	1.16		1.43
in education	0.60		1.09
<b>partner's employ- ment status</b>			
employed / (no partner)	1		1
unemployed	1.76		0.79
not employed	1.12		1.56
<b>partner's work hours</b>			
1-29	0.40		0.16 *
30-40 / (no partner / partner non-empl.)	1		1
41-49	1.18		1.22
50-59	1.13		0.89
60+	1.53	**	1.47
<b>partner's firm size</b>			
very small	1.35		0.79
small	0.93		1.10
medium	0.93		1.15
large / (no partner / partner non-empl.)	1		1
<b>partner's earnings</b>			
1. quintile / (no partner / partner non-empl.) <sup>37</sup>	1		1
2. quintile	1.32		0.65 **
3. quintile	1.32		0.98
4. quintile	1.50	*	0.89
5. quintile	1.70	**	1.15

\*\*\*:p<0.01; \*\*:0.01≤p<0.05; \*:0.05≤p<0.1

<sup>37</sup> See footnotes 26, 28 and 30.

### 7.14 Differences in the timing of first birth by education

In the models discussed in this chapter so far, effects of women's level of education were weak. Since levels of childlessness, though, are substantially higher for women with university degrees than for others, this finding is puzzling. An explanation may perhaps be found in different first birth timing patterns for women with different levels of educational attainment. The maximal time period that women with university degrees can possibly be at risk of first birth is shorter than for women with lower levels of education. Thus, even the same levels of first birth risks for the different educational groups can lead to higher levels of childlessness for women with university degrees simply because the time at risk is shorter. Also, since women with university degrees are aware that they have less time left during which they can choose to have a child, births will be more concentrated across a shorter time span. As a result, first birth risks could even be much higher at some ages for women with university degrees than for those with lower levels of education, and still result in higher levels of ultimate childlessness. Extremely high first birth risks at some ages together with short times at risk can be a cause of small general effects of educational attainment. To see if this is the case, patterns of first birth timing by education will be examined more closely in this section using models specifying an interaction effect between age and education.

One might also suspect that models without an interaction effect give a rather imprecise picture of the effect of education on first birth risks. Instead of a small general negative effect of education, there may actually be strong negative effects at younger ages and strong positive effects at later ages. In age-standardized models, negative effects of education on first birth risks at an early age and positive effects at a later age can cancel each other out. This will also be discussed in describing the results shown below.

Figure 7.8 shows first birth risks by education and age in Great Britain as estimated using a model without interaction effects. The results indicate that first birth risks are slightly lower for women with vocational degrees than for those without a vocational degree, and again somewhat lower for those with university degrees. Figure 7.9 shows results of an interaction model. Here, one can see that between the ages of 31 and 36, first birth risks are actually higher for women with university degrees than for women with lower levels of education. In the early to mid-20s, though, the

effect of university education is much more strongly negative than in the model without the interaction effect. As indicated in both figures, women with a university degree are not at risk of first birth until the early to mid 20s, when they actually have acquired a degree.

The models of which the results are shown in figures 7.8-7.11 were estimated using aML. Since it was difficult to obtain stable and significant estimates for the slopes of the splines in models specifying many nodes, in the end, only one node was used for each educational group. The point where to place the node was determined by first estimating models with more nodes, and then choosing the age where the curve peaked as the point for the node in the final model. Diagrams showing results of earlier models can be found in the appendix.

In western Germany, the results from the model without the interaction effect (figure 7.10) are similar to those found for Great Britain. The peaks of the curves are however somewhat higher, and the slopes are steeper. In western Germany, practically no difference is found between women with a vocational degree and those without a degree in this model. The model with the interaction effect (figure 7.11) however looks very different in western Germany compared to Great Britain. The curve for women with a vocational degree shows the highest and also earliest peak here. Like in Great Britain, between the ages of 31 and 36, first birth risks for women with a university degree are higher than those for women with other levels of education. But, in contrast to Great Britain, the peak in first birth risks for women with a university degree is lower, not higher, than that for women with lower levels of education.

Non-the-less, in models without an interaction effect, first birth risks are found to be significantly lower for women with a university degree in Great Britain, but not in western Germany. Just by looking at the diagrams for the models with interaction effects, this seems to be quite surprising, since first birth risks are so much higher for women with university degrees than for others after the age of 30 in Great Britain. The explanation may however be that women with university degrees in Britain are at risk of first birth for a much longer time in their 20s, when their first birth risks are low, than is the case in western Germany. Many women do not finish education until their late 20s in western Germany. They are not at risk of first birth as someone with a university degree until they are nearly 30. In Britain, by contrast, people tend to gain their degrees in their early 20s. Although they may have already finished their education for several years, their first birth risks are still quite low until past the age of 30.

Since the total time at risk during their 20s for people with a university degree is greater in Britain than in western Germany, this may serve to lower the average risk of first birth for women with university degrees more strongly in Britain than in western Germany.

The pattern given by the results of the interaction model for Great Britain looks more like what one would expect if people with a university degree are reacting to a time-squeeze situation. In the model for western Germany, the curve for women with a university degree just seems to be shifted to the right a bit, and is altogether lower than for other education groups. This does not rule out that women with a university degree in western Germany are reacting to a time squeeze; first birth risks might be even lower at a given age if there were no time squeeze.

To summarize, the explanation for the very small effect of having a university degree on first birth risks in western Germany does not seem to be that, due to a time squeeze, first birth risks for university educated women are extremely high at any particular ages. Due to a time-shift though, the effect of university education is positive after the age of 31, and negative before that age. On average then, in the age-standardized model without the interaction effect, the effect of having a university degree is small. The reason why this small negative effect of having a university degree can lead to much higher levels of childlessness may be that people with a university degree are not at risk of first birth for very long. Thus, their final level of childlessness is high despite their first birth risks not being much lower than for other education groups.

For Great Britain, the question may be why the negative effect of university education is not smaller in models without the interaction effect. First birth risks for university educated women are extremely high between the ages of 31 and 33, possibly reflecting the perception of a time squeeze. One might expect this to even out the average effect of university education. However, women with a university degree in Great Britain are at risk of first birth for quite a long time in their 20s, and during this time their first birth risks are very low. This seems to lead to a very low average level of first birth risks for university educated women in Great Britain.

Thus, time-squeeze effects seem to be less important in shaping general effects of education in these two countries. Rather, a time-shift tends to lead to a mutual canceling-out of positive and negative effects of education. The length of the time period during which women with different levels of education are at risk of first birth is also

very important for outcomes in terms of average effects of education on first birth risks. Not including an interaction effect between age and education leads to a very imprecise picture of the timing of first birth in the individual education groups. Whether this is a serious problem will depend on whether other variables of interest are correlated with the timing of first birth by education or not.

Figure 7.8

Great Britain: effects of education and age without interaction effect

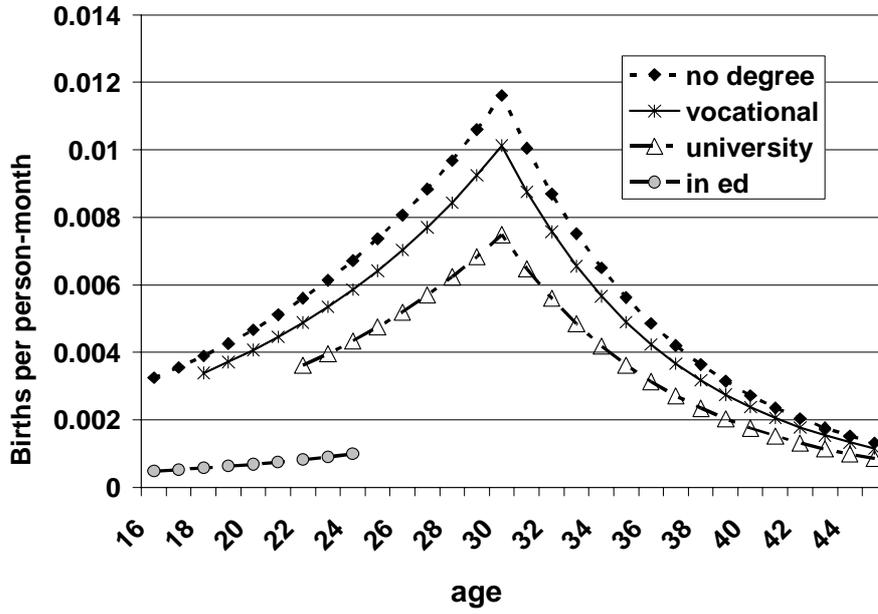


Figure 7.9

Great Britain: interaction of education and age

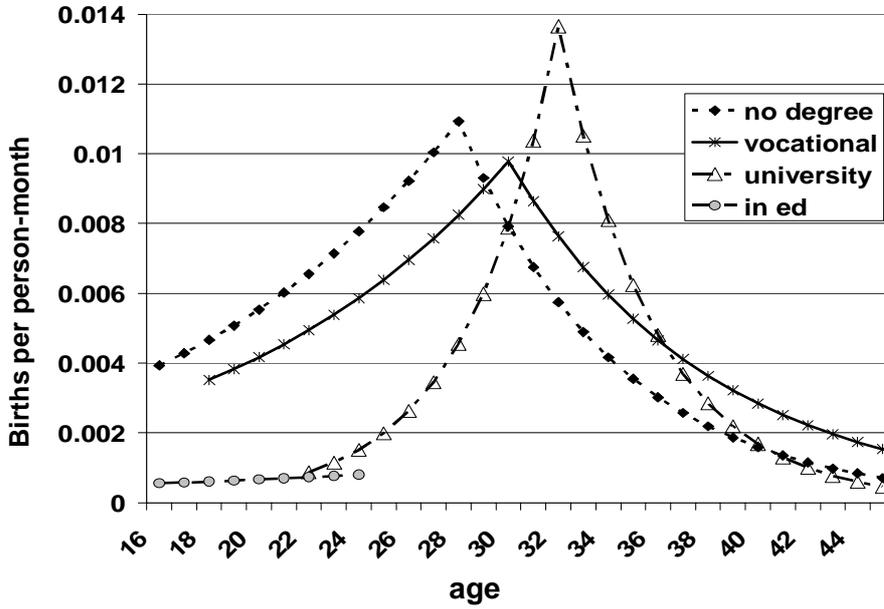


Figure 7.10

western Germany: effects of education and age without interaction effect

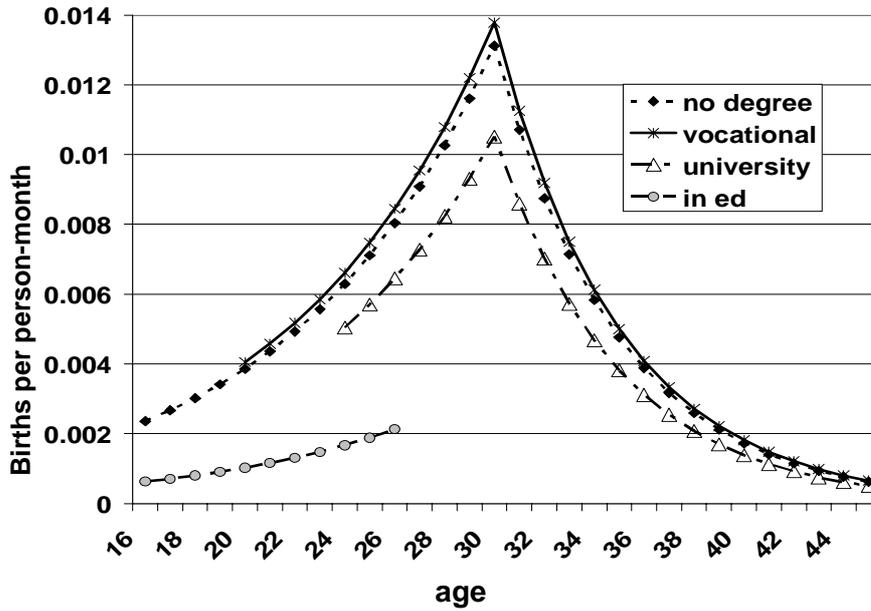
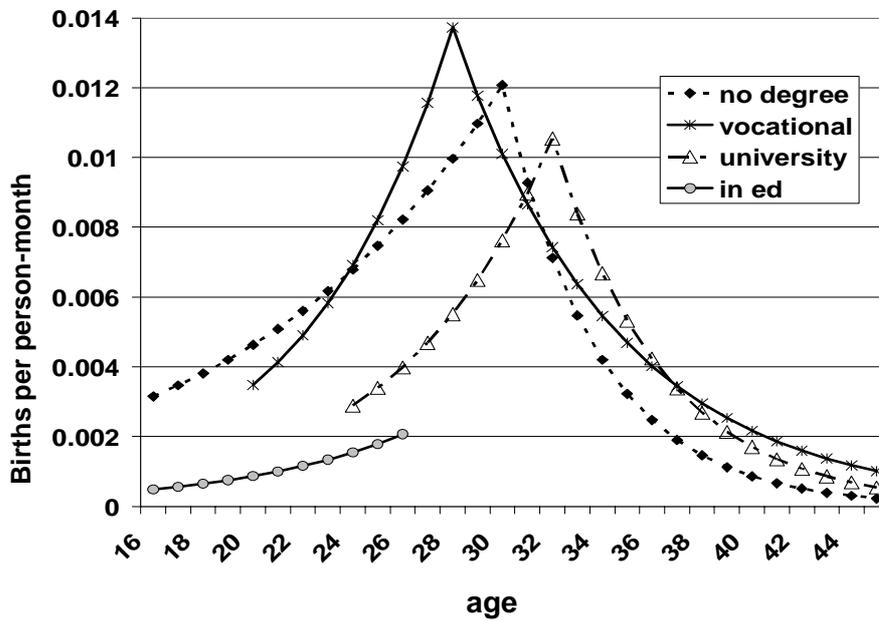


Figure 7.11

western Germany: interaction of education and age



### 7.15 Summary

This chapter tested the effect on risks of first birth of education as well as employment characteristics of women and their partners in western Germany and Great Britain in

the 1990s. The analyses started out by looking at the effect of women's and men's level of education on first birth risks. The level of education is often taken to be an indicator of women's earnings potential and thus of their opportunity costs of interrupting work to take care of children. However, no general effect of education was found for western Germany. For Great Britain, an effect was only found before controlling for partnership status. Weak general effects of education are not all that surprising, though, given different timing patterns of first birth by education and different durations of time that women are at risk of first birth after acquiring each type of degree. Interaction models discussed at the end of this chapter showed that there is a positive effect of university education after the age of 30-31 and a negative effect before that age in both countries. Also, the time at risk of first birth is shorter for women with university degrees than for others, especially in western Germany.

Based on assumptions about opportunity cost considerations, the hypothesis with respect to employment status had been that both part-time work and unemployment would have positive effects on first birth risks for women. As it turned out though, Great Britain and western Germany are very different in this respect. Only in Great Britain is there a significant positive effect of unemployment, and only in western Germany is there a significant positive effect of part-time employment. In a model looking more precisely into the effects of working hours, it was found that especially working 20-29 hours, but not an extremely short week of less than 20 hours, had a positive effect on first birth risks for women in western Germany. The effect of part-time employment in western Germany no longer holds when controlling for partnership status. The effect of unemployment in Great Britain by contrast does still hold after controlling for partnership status. There is no effect of the partner being unemployed in either country, although a negative effect was expected especially for Great Britain, where only flat-rate unemployment benefits are paid. Especially for Great Britain, negative effects of men's part-time work were also expected because part-time jobs tend to be very low paid. However, a negative effect was only found for western Germany.

As hypothesized, there is a positive effect of the size of the firm where women are employed on first birth risks in Great Britain. This was expected because firm discretion in providing flexible employment schedules and supplementary leave may be especially important in Britain where statutory leave is short. Previous research has also found a correlation between public sector employment and family friendly work

arrangements for Britain (Evans 2001; den Dulk 2005). Therefore, a positive effect of being employed in the public sector was expected as well. However, public sector employment does not seem to influence first birth risks in Britain. For western Germany, positive, though perhaps weaker, effects of public sector employment and firm size were expected as well. No effect of public sector employment was found for western Germany either however. Instead of a positive effect of firm size, there is a somewhat odd negative effect of being employed in a medium-sized firm with 20-199 employees instead of in a smaller or larger firm.

While no general effect of the partner's vocational qualification was found, there were significant effects for some sub-groups in Great Britain. Having a vocational degree may be especially important to reduce economic insecurity during times of high unemployment, and in relatively high risk employment situations such as self-employment. Significant positive effects of the partner's vocational qualification were found for the time period of 1992-1993, when unemployment was especially high in Great Britain. The partner's vocational qualification was also important among the self-employed. First birth risks were significantly higher for women whose partner was both self-employed and had a vocational degree than for those whose partner was either an employee with or without a degree, or self-employed without a degree.

Working long hours had a negative effect on first birth risks for women in western Germany. This especially applied to women working 41-49 hours a week, that is, only somewhat more than a standard work week. In Great Britain, if women worked long hours, this had no effect on first birth risks. For men, working long hours had a positive effect in both countries, but the effect was stronger in Great Britain.

Although one might expect the opportunity costs of interrupting work to be especially high for women working as professionals, they were not found to have much lower first birth risks than others working in the service sector in either country. One reason could be a time-squeeze, as the majority of professionals have university degrees. In Britain, managers had lower first birth risks than professionals, although their average level of vocational qualification is lower than for professionals. High first birth risks were found for service and sales workers and manual workers in both countries. Working in typically female dominated occupations, for example as a nurse or a clerk, did not have a very strong effect on first birth risks in either country. Only in western Germany, after controlling for the partner's occupation, teachers turned out to have higher first birth risks than other women working in the service sector. A large

proportion of men in both countries were employed in crafts occupations. However, the partner being employed in this type of occupation had a negative effect in Great Britain, but not in western Germany. By contrast, the partner working in an elementary occupation strongly lowers first birth risks in both countries. In western Germany, first birth risks are 46% higher for women whose partners are professionals than for those whose partners are managers, but this effect is not significant.

A U-shaped effect of income on first birth risks was found for women in western Germany. This contradicts the hypothesis of a straightforward negative effect of women's earnings. This had been expected because women in western Germany are usually found to be reluctant to make use of childcare, leading to higher opportunity costs for those with higher levels of income. A U-shaped effect was expected for Britain, where purchasing childcare is socially better accepted. However, this hypothesis was only partially supported. For Britain, more of a doubled U-shaped effect was found, with first birth risks being highest for the 1<sup>st</sup> and the 3<sup>rd</sup> quintile, and rising only slightly between the 4<sup>th</sup> and the 5<sup>th</sup> quintile. Generally, positive effects of the partner's income were found in both countries, though in western Germany, first birth risks were lowest for women whose partner had earnings in the 2<sup>nd</sup> quintile instead of the first quintile.

In a model including variables for firm size, work hours, and earnings at the same time, working long hours was still found to have a significantly negative effect for women in western Germany. Both the negative effect of working in a small firm and the positive effect of having very low earnings grew stronger for women in Britain in this model. This is likely to be due to the fact that the two variables are correlated but have opposite effects on first birth risks. By contrast, for western Germany the effect of women's earnings loses strength in this model. When both variables are included in the same model, for Great Britain, the positive effects of men's work hours and earnings each become a bit weaker. However, they are both still significant. In western Germany, the effect of the partner working long hours is no longer significant in this model. However, the negative effect of the partner working part-time is still significant in western Germany, although earnings are controlled for in this model. The effect of the partner's earnings is also still significant.

Thus, in Great Britain, opportunity cost considerations seem to find an expression in positive effects on first birth risks of women being unemployed or having very low earnings. The family-friendliness of the employment situation appears to have an

impact on first birth decisions as well in Britain in that firm size has a positive effect on first birth risks. The reason for this effect may be that women working in small firms fear compatibility problems of work and childrearing because of lack of flexible employment opportunities. In western Germany, especially women who work more than 40 hours a week appear to be reluctant to decide to have a first child. Reasons may be that this group of women has especially good career prospects which they would be likely to lose across long periods of absence, or that they have a special need for the extra income from overtime work. Work hours do not seem to be as much of an obstacle in Great Britain. In both countries, the level of the partner's earnings still is quite important for the decision to have a first child. Having a service, sales, or manual occupation seems to be connected to especially low opportunity costs for women in both countries. Working in a crafts occupation has a negative effect for men in Britain but not in western Germany, perhaps pointing to differences in working conditions in this type of occupation between the two countries. There may be some evidence that women who work as a teacher anticipate more social support for combining motherhood and employment than do other professionals in western Germany, as first birth risks for teachers are exceptionally high after controlling for the partner's occupation.

## Chapter 8

### **Employment duration, employer tenure and first birth in Great Britain**

#### **8.1 Introduction**

In this chapter, the impact of work experience on first birth decisions is studied. The analysis relates exclusively to Great Britain, since the British data include complete employment histories, which allow hypotheses on the effects of work experience on first birth risks to be tested. As delineated earlier in chapter 3, economic models of first birth timing predict positive effects of late birth timing within the career on lifetime earnings (Hotz, Klerman, and Willis 1997). An hypothesis is therefore that women will be more likely to decide to have a first child the more employment experience they have gathered. Women with higher levels of qualification most often have jobs where human capital accumulation is more rapid at the beginning and slower later on. Therefore, the advantage of postponing first birth is greater for them (Gustafsson 2001). The effect of employment experience should accordingly be stronger for women with higher than for women with lower levels of qualification. In addition, it has been found that women often expect that they will have less opportunities for advancement if they have children early in their career. Therefore, there is a tendency to wait until one has advanced somewhat in ones career before deciding to have children (Ranson 1998). This is also likely to apply more strongly to women with higher levels of education, who will have more opportunities for advancement than women with lower levels of qualification. To summarize then, a second hypothesis is that employment experience, while having a positive effect on first birth risks for all women, will have a stronger effect for women with higher levels of education.

A third hypothesis relates to the specific regulations for maternity leave in Great Britain. Maternity leave was introduced in 1976 for those who had been working for their employers full-time for at least 2 years, or part-time for at least 5 years. Requirements for maternity leave were successively weakened. However, until 2003 at least some elements of maternity leave and maternity pay were still conditional on having acquired a certain amount of tenure with ones employer. The second part of

this chapter tests the hypothesis that the specific requirements for maternity leave had an effect on fertility timing in Great Britain.

## **8.2 Employment duration and first birth**

The models testing for an effect of work experience on first birth risks in this chapter distinguish between current continuous work experience and previous work experience. Current continuous work experience is defined as all of the work experience that has been accumulated during the present employment spell, that is, employment experience acquired after the end of the last employment break. Previous work experience is all the work experience that has been accumulated prior to the present employment spell, in other words, work experience that is separated from the current spell by an employment break. The idea is that current continuous work experience should play a more important role in fertility decision-making than previous work experience. If there are breaks separating employment episodes, human capital previously accumulated is likely to have depreciated. When employment is not continuous, it is also more likely that an occupational change has occurred. Then, skills specific to the previous occupation will not be of use anymore, and new skills need to be acquired in the initial phases of the new career. Jobs within a continuous employment phase are more likely to belong to the same career.

Blossfeld and Huinink (1991) have tested the effect of a composite measure of work experience and occupational prestige on first birth risks. Their indicator for career resources can assume higher values both because of higher levels of occupational prestige and because of greater work experience. Thus, it is not possible to distinguish effects of work experience from effects of occupational prestige. As pointed out by Kravdal (1994), though, earnings potential and work experience may have opposite effects. There may be mechanisms, such as those named in the introduction, that lead to a positive effect of work experience, independent of earnings potential. Like in Kravdal (1994), the models in this chapter test for an effect of work experience on first birth risks while controlling for educational attainment, which may be seen as an indicator of earnings potential and labor market opportunities. Differently than Kravdal (1994) though, the effect of current work experience is differentiated from that of previous work experience. Also, the effect of current work experience is al-

lowed to vary with employment duration, to see if employment duration has a stronger effect earlier or later on in employment spells.

In this chapter, effects of full-time work experience only on first birth risks are studied. Career development is likely to be very different in part-time than in full-time jobs. Models testing for the effect of part-time work experience on first birth risks have also been run. The effect of part-time work experience on first birth risks was found to be largely negative. However, case numbers are quite small, thus preventing stable results. Therefore, this chapter concentrates on full-time work experience only.

Table 8.1 shows a model testing for the general effect of full-time work experience on first birth risks, not interacted with education. An especially strong positive effect of continuous full-time employment experience is found across the first year of employment. After one year of continuous full-time employment, first birth risks are about 70% higher than at the beginning of the employment spell. After the first year of employment, work experience continues to have a positive effect, but the effect is now weaker. Across the next 3 years, first birth risks rise by only 7%. Between 4 and 8 years of work experience, first birth risks rise by another 27%. After 8 years of work experience, there is practically no further increase in first birth risks. Previous full-time work experience, by contrast, has no effect on first birth risks. These results support the hypothesis of a positive general effect of continuous work experience on first birth risks. Women working full-time appear to postpone first birth until they have gained some experience within their current employment spell. The reason may be that they want to lengthen the period of employment before an interruption to maximize life-time earnings, as predicted by economic models of fertility timing. It could also be the case that they want to move on in their jobs and secure a good position before having a first child, as can be inferred from an alternate model of skill appreciation and first birth timing by Gustafsson (2001) and qualitative results by Ranson (1998). However, the greatest increase in first birth risks is across the first year of the employment spell. This seems to indicate that beginning a new employment spell leads to a short-time postponement of the decision to have a first child. Although this effect was not expected, it is quite plausible. When starting a new job, people will want to find out more about the working conditions specific to this job before making a decision with such long-term consequences as having a first child. That there is no significant effect of previous work experience in this model also sup-

ports the hypothesis that current work experience is more important for first birth decisions than previous work experience.

**Table 8.1: Risk of first birth.**

**Model including union and marriage duration**

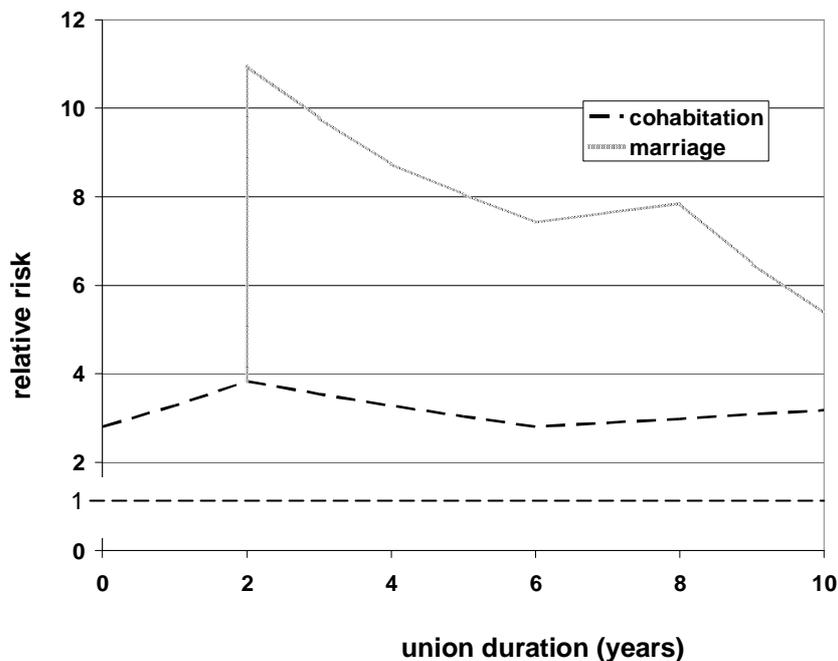
Estimates are log relative risks

<b>constant</b>	-6.792	***
<b>age</b>		
<i>slopes (increment per month)</i>		
16-18	0.026	***
18-22	-0.015	***
22-30	0.000	
30-45	-0.011	***
<b>union duration</b>		
intercept	1.031	***
<i>slopes (increment per month)</i>		
0-2 years	0.013	**
2-6 years	-0.007	*
6+ years	0.003	
<b>marriage duration</b>		
intercept	1.051	***
<i>slopes (increment per month)</i>		
0-2 years	-0.003	
2-6 years	0.000	
6+ years	-0.018	***
<b>full-time employment duration</b>		
<i>slopes (increment per month)</i>		
0-1 year	0.044	***
1-4 years	0.002	
4-8 years	0.005	**
8+ years	0.000	
<b>employment status</b> (reference category: beginning of full-time employment)		
part-time employed	0.811	***
self-employed	0.389	*
not employed	1.465	***
other empl. status	0.183	
in education	-0.572	***
<b>previous full-time experience (months)</b>	0.000	
<b>union order</b>		
1st union	0	
2nd union	0.000	
3rd+ union	0.367	**
<b>cohort</b>		
1940-1949	0	
1950-1959	-0.069	
1960-1969	0.016	
1970-1984	-0.023	
<b>educational attainment (school degree)</b>		
no degree	0.369	***
low	0.251	***
medium	0	
high	-0.176	**

\*\*\*:p<0.01; \*\*:0.01≤p<0.05; \*:0.05≤p<0.1

The model shown in table 8.1 also controls for union duration, marriage duration, and union order. The effects of union duration and marriage duration are additive<sup>38</sup>. That is, if people get married, the effect of union duration still applies to them, and the effect of marriage duration is an effect in addition to the effect of union duration. Starting cohabitation increases the risk of first birth by 180%. Increases in first birth risk with union duration are less strong. Across the first two years of cohabitation, first birth risks increase by 37%, and then decrease again by 29% between 2 and 6 years of cohabitation. After 6 years of cohabitation, there is little change in first birth risks. Getting married increases the risk of first birth again by about the same amount as starting a union in general, by 186%. So if people get married immediately without prior cohabitation, the joint effect of starting a union and starting marriage is to raise first birth risks by 700%. After 6 years of marriage, marriage duration has a negative effect on first birth risks. First birth risks decrease by 19% per year after 6 years of marriage. Figure 8.1 illustrates the effects of union duration and marriage duration for an example where a couple gets married after 2 years of cohabitation.

**Figure 8.1**  
**Effect of union and marriage duration on first birth risks**



<sup>38</sup> They are additive when looking at log relative risks. The relative risks are of course multiplicative.

In the model shown in table 8.1, a positive effect of union order on first birth risks is found. Being in a third or higher order union increases first birth risks by 44%. Apparently, people feel more secure about their union when it is not only the first or second union.

Whether to include controls for union and marriage duration when studying the effect of work experience is however debatable. On the one hand, work experience could be correlated with union duration. Estimates for the effects of work experience on first birth risks may therefore just be picking up effects of union duration if it is not controlled for. On the other hand, union duration should be more strongly correlated with age than with work experience, and age is controlled for in any case. More importantly though, causality may be in the opposite direction. The decision to get married and to have children will often be a simultaneous decision. Then, if people have gathered some work experience and feel that other factors as well are right, they decide to get married and also subsequently to have children. Thus, cohabitation, and more so marriage, could just be an indicator that the decision to start the process of family formation has already been made.

Controlling for partnership status can therefore be problematic. Figure 8.2 compares the effect of continuous full-time work experience in models not controlling for partnership status, controlling for partnership status, and controlling for union and marriage duration. As one can see, the effect of work experience is estimated to be quite a lot stronger in the model not controlling for partnership status. The difference in effects of work experience between the different models is especially large between 1 and 8 years of employment experience. In all models however, the effect of continuous employment duration is found to be positive. There is especially little difference in the size of the effect estimated for the first year of an employment spell.

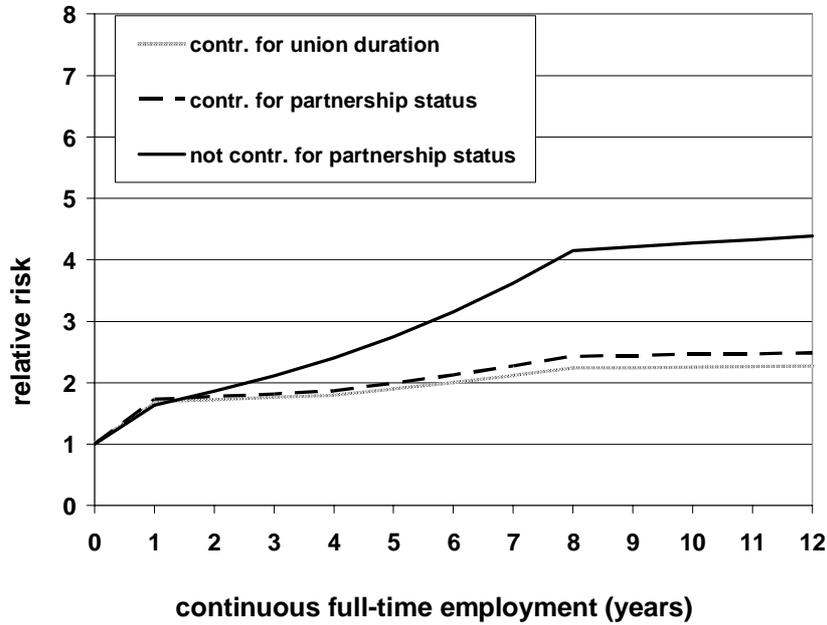
Including partnership status alters the estimates for the effects of other variables in the model quite strongly. This is not only the case for work experience, but especially also for age. Figure 8.3 shows the estimates for the effect of age in the three different models. When controlling for partnership status or union duration, the peak in first birth risks is estimated to be as early as age 18. In the model controlling for union duration, practically no effect of age is estimated between the ages of 22 and 30. Any differences in first birth risks by age in this range found in the alternate model could be explained by partnership status and duration. Again, one might wonder if this does not give a false impression of the direction of causality. People may

actually be taking their age into consideration when they decide to begin a union and to begin family formation.

**Figure 8.2**

**Effect of full-time employment duration on first birth risks in models including and not including partnership status and union duration**

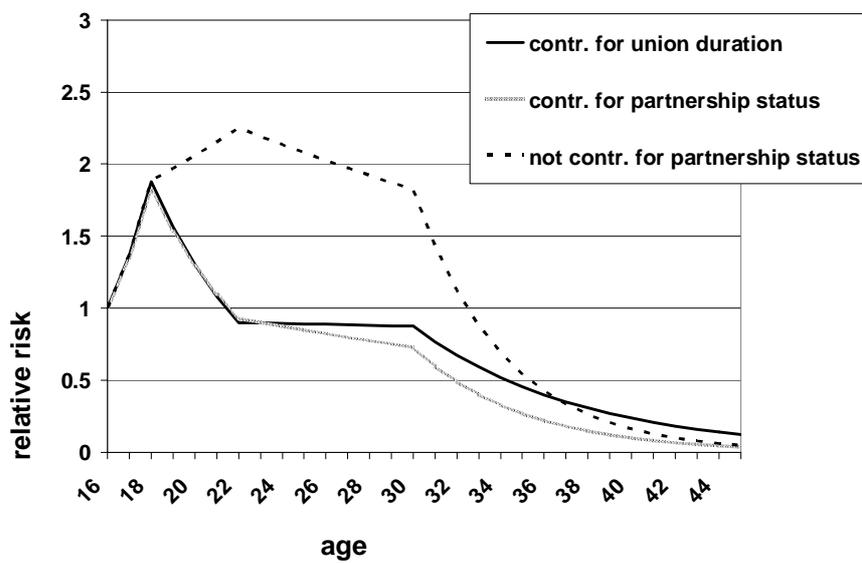
**Risks relative to the beginning of each spline**



**Figure 8.3**

**Effect of age on first birth risks in models including and not including partnership status and union duration**

**Risks relative to age 16**



To test the hypothesis that employment duration has a stronger positive effect on first birth risks for women with high levels of education than for those with lower levels of education, a model interacting education with employment duration was run (table 8.2). As discussed in chapter 7, the effect of age on first birth risks differs strongly between educational groups. To make sure that the interaction of employment duration and education does not just pick up differences in the effect of age between the educational groups, age was also interacted with education in this model. The model for which the estimates are shown in table 8.2 does not include partnership status or union duration. However, in figure 8.4 below, the effects of continuous work experience by education in this model can be compared to the effects in models controlling for union and marriage duration, shown in figure 8.5.

Figure 8.4 shows positive effects of continuous work experience for all educational groups, except for women with low education between 1 and 4 years of work experience and women with high education after 8 years of work experience. There is no clear indication of a stronger effect of work experience for women with higher levels of education. Instead, the effect of work experience on first birth risks seems to be relatively similar for all educational groups. In the model controlling for marriage and union duration, shown in figure 8.5, long-term effects of work experience on first birth risks are weakened for all educational groups. The increase in first birth risks across the first year of employment remains stable however. For most educational groups, there is no longer any uniform direction for the development of first birth risks after one year of continuous work experience.

In both models, women with a high level of education seem to have the highest first birth risks at 8 years of employment duration. Women with high education postpone first birth across the first 4 years of employment duration, whereafter the risk of first birth rises to its highest level at 8 years of employment. The most straightforward positive effect of employment experience on first birth risks was found for women with a medium level of education. Women with low education seem to postpone first births until after 8 years of continuous employment. Like women with high education, those with no education postpone first births until after 4 years of employment experience. So, there seems to be some pattern of postponement of first birth immediately after starting employment, and then again until after 4 years of employment experience. First birth risks tend to be higher after 4 years, and sometimes after 8 years of employment experience than before. It is difficult, though, to come to any

clear conclusion for which educational group the effect of employment experience on first birth risks is greatest.

In table 8.2, one can also see that the effect of previous work experience is now significant and positive. This is also the case in models not interacting age and current work experience with education as soon as partnership status is not controlled for anymore. Previous work experience seems to be correlated with the likelihood of being in a partnership. When partnership status is not controlled for, previous work experience has a positive effect. In this model then, there is not as much support for the hypothesis that previous work experience is not so important for decisions to have a first child. Still, however, the effect of previous work experience is smaller than the effect of current work experience across most segments of current work experience for most educational groups. Also, the effect of previous work experience is less stable than the effect of current work experience, since it no longer holds when controlling for partnership status.

**Table 8.2**  
**Risk of first birth: interaction of education with full-time employment duration and age**  
**(model not controlling for partnership status or union duration)**

Estimates are log relative risks

<b>constant</b>	-5.945	***
<i>interaction of age and education</i>		
<b>age (no degree)</b>		
<i>slopes (increment per month)</i>		
16-20	0.022	***
20-25	-0.011	***
25-32	-0.015	***
32-45	-0.026	***
<b>age (low education)</b>		
intercept	-0.692	*
<i>slopes (increment per month)</i>		
16-20	0.024	***
20-25	0.000	
25-30	-0.016	**
30-45	-0.038	***
<b>age (medium education)</b>		
intercept	-0.326	
<i>slopes (increment per month)</i>		
16-20	0.010	
20-25	0.003	
25-32	-0.009	***
32-45	-0.029	***

<b>age (high education)</b>	
intercept	-0.955
<i>slopes (increment per month)</i>	
16-20	0.002
20-25	0.008 *
25-30	0.003
30-36	-0.012 ***
36-45	-0.024 ***
<i>interaction of full-time employment duration and education</i>	
<b>full-time employment duration (no degree)</b>	
<i>slopes (increment per month)</i>	
0-1 year	0.029
1-4 years	0.002
4-8 years	0.016 ***
8+ years	0.008 ***
<b>full-time employment duration (low education)</b>	
intercept	-0.006
<i>slopes (increment per month)</i>	
0-1 year	0.076
1-4 years	-0.008
4-8 years	0.011
8+ years	0.018 **
<b>full-time employment duration (medium education)</b>	
intercept	-0.227
<i>slopes (increment per month)</i>	
0-1 year	0.036
1-4 years	0.014 **
4-8 years	0.011 ***
8+ years	0.006 **
<b>full-time employment duration (high education)</b>	
intercept	0.226
<i>slopes (increment per month)</i>	
0-1 year	0.068 *
1-4 years	0.004
4-8 years	0.015 ***
8+ years	-0.007 **
<b>employment status</b>	
<i>(reference category: beginning of full-time employment (low edu))</i>	
part-time employed	1.083 ***
self-employed	0.649 *
not employed	1.805 ***
other empl. status	0.126
in education	-0.937 ***

<b>previous full-time experience (months)</b>	0.007	***
<b>cohort</b>		
1940-1949	0	
1950-1959	-0.033	
1960-1969	-0.083	
1970-1984	-0.342	***

\*\*\*:  $p < 0.01$ ; \*\*:  $0.01 \leq p < 0.05$ ; \*:  $0.05 \leq p < 0.1$

Figure 8.4

Effect of full-time employment duration on first birth risks by education  
(model not controlling for partnership status or union duration)

Risks relative to the beginning of each spline

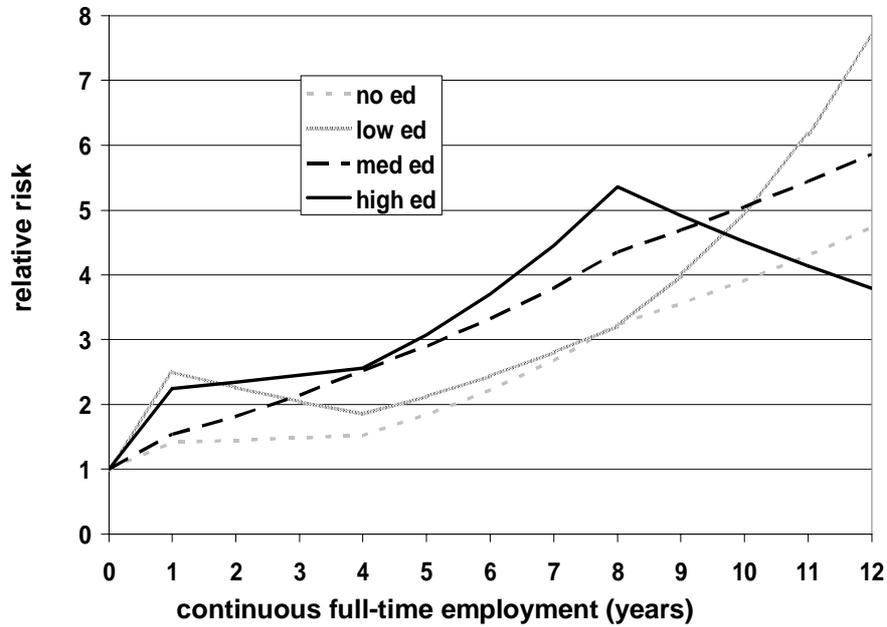
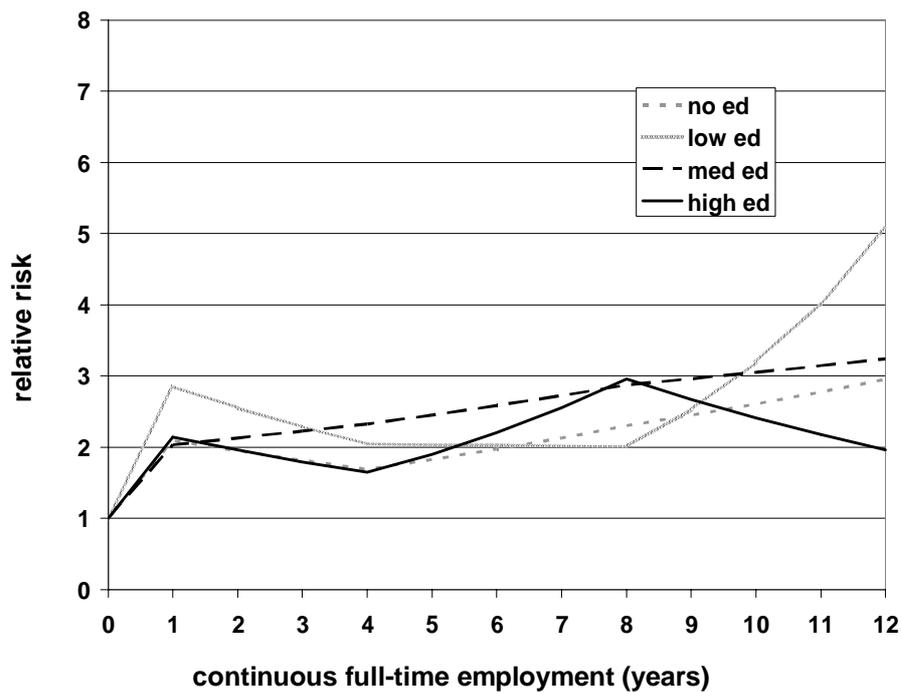


Figure 8.5

Effect of full-time employment duration on first birth risks by education  
(model controlling for partnership status and union duration)

Risks relative to the beginning of each spline



### 8.3 Tenure requirements for maternity leave and first birth

Maternity leave was introduced in June 1976 in Great Britain. The requirement for eligibility was that one had to have been employed for 2 years with ones employer until the 11<sup>th</sup> week before the expected week of childbirth. That means that mothers were eligible for maternity leave if they were employed with the same employer for 18 months at the time of conception. Regulations for maternity leave were altered in 1987. Now, one had to have been employed for 1 month longer with the same employer for the right to retain one's job and, as before, to receive income dependent maternity pay for 6 weeks. However, to receive a flat-rate benefit for 18 weeks, one only had to have had 6 months insured employment during the last year. In 1994, 14 weeks of unconditional maternity leave were introduced. But, for an additional 14 weeks of maternity leave, one still had to be employed with the same employer for 2 years into the 15<sup>th</sup> week before the expected week of childbirth. An additional change was that one now only had to have had 6 months insured employment to receive income dependent maternity pay<sup>39</sup>.

The hypothesis is that women postponed first birth until they had accumulated enough tenure to meet the requirement for maternity leave, once it was introduced in 1976. After 1987 then, since a flat rate benefit was now available without necessarily having to have been employed with the same employer for any amount of time, the effect is expected to become weaker. After 1994, the effect is expected to become weaker still since 14 weeks of leave are now available without any tenure requirements.

These hypotheses are tested separately for the different educational groups. The idea is that maternity leave may be more important for women with higher levels of education because they would have higher opportunity costs of losing their jobs. Figures 8.6-8.9 show the effects of employer tenure on first birth risks (or, to be more precise, first conception risks). For these models, employer tenure was used, not continuous full-time employment duration (within which employer changes were possible) as in the previous section. The effect of employer tenure on first birth risks was modeled in a piecewise-constant manner (using aML) to better be able to compare

---

<sup>39</sup> Maternity, paternity, and parental leave regulations are described in more detail in chapter 4.

first birth risks between different durations of employer tenure. The cohorts included in these models are cohorts 1935-1984.

Figure 8.6 shows the effect of employer tenure on first conception risks before June 1976. This is the time before maternity leave was introduced. The reference category for each educational group is 0-1 year of employer tenure (for that educational group). In each educational group, first birth risks rise after 1 year of employer tenure. This is especially so for those with a high level of education, where the increase in first birth risks is significant. After 18 months of employer tenure, first conception risks decrease again for those with high or medium education, and continue to rise slowly for those with low education. So, for all educational groups, first conception risks begin to rise after one year of tenure, and either decline or continue to rise only slightly after 18 months of tenure. This type of a pattern is conceivable, since there is not yet any reason to postpone the decision to have a first child until after 18 months of tenure.

Figure 8.7 then shows the effect of employer tenure on first conception risks between June 1976 and 1987. During this time, both the right of reinstatement and any kind of maternity pay depended on having had 18 months of employer tenure. Judging from the shape of the effect of employer tenure on first conception risks in figure 8.7 though, it seems that only women with a high level of education reacted to these requirements in order to take advantage of the new possibility for maternity leave. For women with a high level of education, first conception risks no longer rise after 1 year of employer tenure. After 18 months of employer tenure, they increase only slightly. The postponement is thus longer than what would be expected. There are no strong increases in first birth risks for women with a high level of education until after 3 years of employer tenure.

The effect of employer tenure on first conception risks between 1987 and 1994 is shown in figure 8.8. During this time period, all education groups seem to adhere most closely to the expected pattern. This is a bit surprising, since regulations had actually become slightly more generous in 1987. The required amount, now 19 months<sup>40</sup>, of employer tenure was still necessary for the right to retain one's job dur-

---

<sup>40</sup> Since now 19 instead of 18 months of tenure were necessary, an idea might have been to specify the effect of employer tenure differently for the time periods after 1987. The effect of employer tenure could have been allowed to change after 19 instead of 18 months. In the end, I decided not to change the point where the effect of employer tenure was allowed to change in order to make the effect of employer tenure more comparable across time periods. Even if 19 months of tenure were required to be

ing maternity leave and to receive an income-related benefit. But, a flat rate benefit was now available even if one had not been employed with the same employer for any amount of time. In any case, as in the previous time period, women with a high level of education still continue to postpone the decision to have a first child for longer than 1 year of tenure. At 18 months of tenure then, there is a relatively clear increase in first birth risks. Women with a low level of education show a less clear but relatively similar pattern to that of women with a high level of education. Women with a medium level of education demonstrate the strongest reaction to the requirements for maternity leave. First birth risks even decrease after one year of tenure, to then rise quite strongly after having accumulated 18 months of tenure.

After 1994, 14 weeks of maternity leave became available without any requirements. Six months of insured employment with any employer in the previous year were sufficient to receive income-related maternity pay. For 14 additional weeks of leave, the same tenure requirements as before still applied. However, as can be seen in figure 8.9, the additional 14 weeks of leave do not seem to have been enough of an incentive to postpone the decision to have a first child until after 18 months of tenure. After 1994, in no educational group did women react to the requirements for additional leave in their fertility timing. Thus, the loosening of the requirements for maternity leave after 1994 seems to have altered fertility timing. The effect of employer tenure on first birth risks now has a very similar shape to that of before 1976 again, before maternity leave was introduced.

---

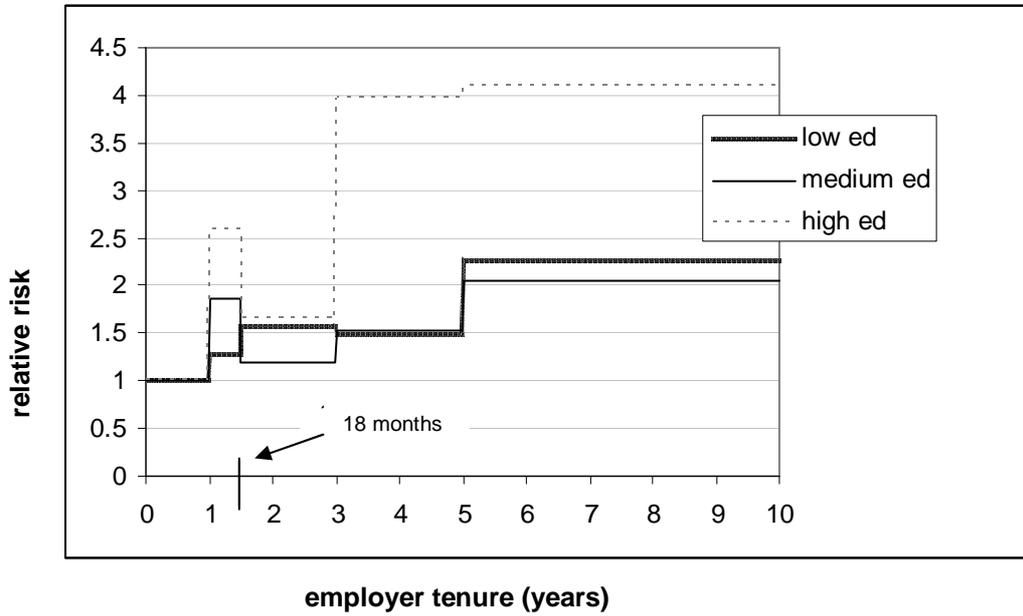
eligible for maternity leave after 1987, this still implies that women would have to postpone the decision to have a child for at least 18 months.

**Figure 8.6**

**Before June 1976**

**Effect of employer tenure on first birth risks by education**

**Risks relative to first year of employer tenure**

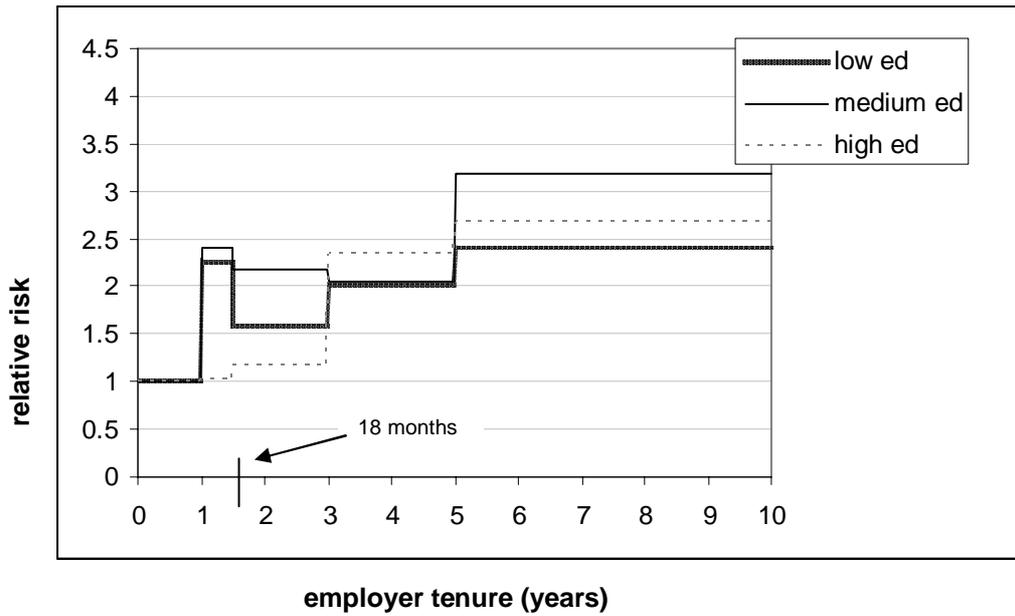


**Figure 8.7**

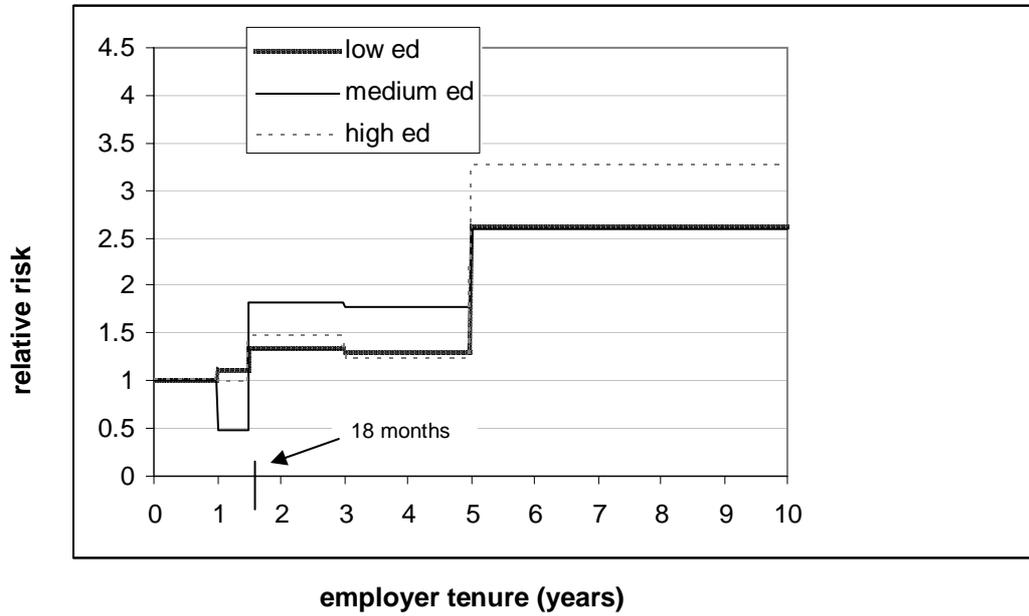
**Between June 1976 and 1987**

**Effect of employer tenure on first birth risks by education**

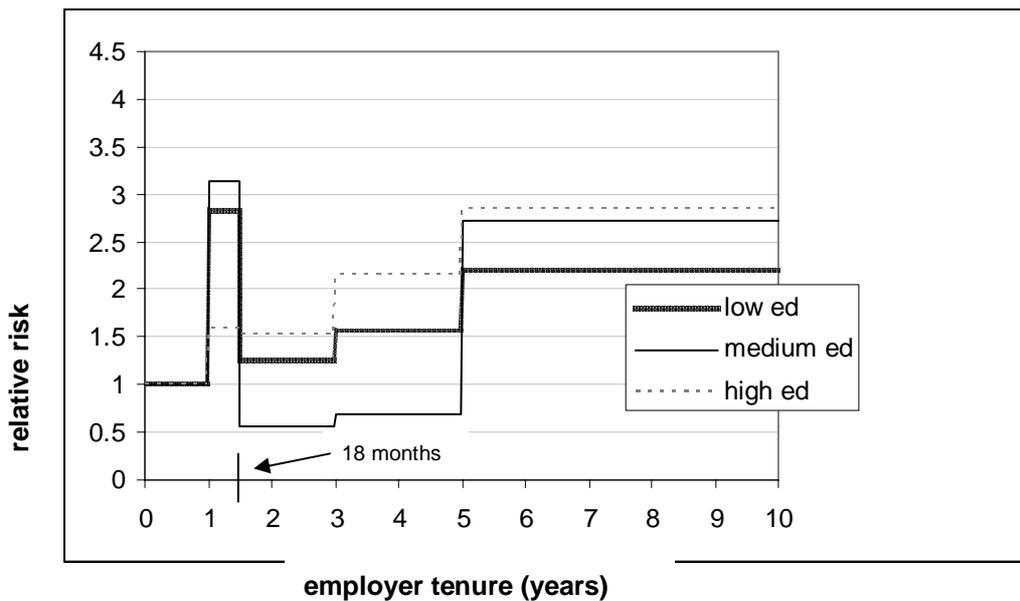
**Risks relative to first year of employer tenure**



**Figure 8.8**  
**Between 1987 and 1994**  
**Effect of employer tenure on first birth risks by education**  
**Risks relative to first year of employer tenure**



**Figure 8.9**  
**After 1994**  
**Effect of employer tenure on first birth risks by education**  
**Risks relative to first year of employer tenure**



## 8.4 Summary

Continuous full-time employment experience was found to have a positive effect on first birth risks. This corresponds to the hypothesis that women postpone the decision to have a first child until they have acquired some work experience in order to maximize life-time earnings or to secure a good position before beginning family formation. However, there was not much support for the hypothesis that the effect of work experience is stronger for women with a high level of education. This had been expected because the careers of women with a high level of education are often characterized by intensive skill development in the early career. According to a model of skill appreciation by Gustafsson, women with a high level of education profit the most from a postponement of first birth in terms of life-time earnings. Also, their employment position is more likely to change in the early career than is the case for women with a lower level of education, so that they would have more reason to wait to secure a good position. There is no evidence though that continuous work experience affects first birth timing differently for women with a high level of education than for women with lower levels of education.

An unexpected but plausible result was that first births are consistently postponed at the very beginning of a new employment spell. The steepest increase in first birth risks was found across the first year of a new employment spell. This type of a pattern is quite plausible since people will want to find out more about the employment conditions in their new job before making the important and long-term decision to have a first child.

The size of the increase in first birth risks with employment experience beyond the first year of employment depended on whether partnership status was controlled for or not. In models not controlling for partnership status, the increase in first birth risks beyond the first year of employment was quite strong. In models controlling for partnership status, a positive effect of employment experience beyond the first year remained, but it was weaker. Whether to include partnership status or not is an ambivalent question.

The hypothesis that current employment experience is more important than previous employment experience was partially supported. In models controlling for partnership status, there was no significant effect of previous employment experience, while the effect of current employment experience was significant. By contrast, in

models that did not control for partnership status, there was a significant effect of previous employment experience in addition to the effect of experience within the current employment spell. It was expected that current employment experience would be more important for first birth decisions than previous employment experience because skills depreciate during times of absence, so that the process of skill building partially starts over again when a new job is found. Also, if one begins a new job after a time of absence, it will again take some time to gain employment security and to achieve some job advancement independent of the amount of work experience that one had before a time of absence from employment.

The special requirements for maternity leave in Great Britain were found to affect fertility timing. Women had to have acquired a certain amount of employer tenure to qualify for maternity leave. After the introduction of maternity leave in 1976, at first only women with a high level of education adjusted their fertility timing to meet the requirements for maternity leave. Between 1987 and 1994 then, the shape of the effect of employer tenure on first birth risks indicated that women with all levels of education postponed the decision to have a first child until they had enough tenure to be eligible for maternity leave. Starting in 1994, a basic amount of maternity leave was freed from tenure requirements. Additional maternity leave still depended on tenure. However, after 1994, there no longer was any evidence of an adjustment of fertility patterns to meet the requirements for additional leave. Apparently, the prospect of additional leave was not enough of an incentive to adjust fertility timing as soon as basic leave was unconditionally available.

## Chapter 9

### **Unobserved heterogeneity and the effect of non-employment on first birth risks**

In the analyses so far, the direction of causality was assumed to run from respondents' employment characteristics to decisions to have a first child. Self-selection into a specific employment situation was not taken account of. However, it is possible that people who have a strong preference for children in the first place choose an employment situation that is particularly compatible with caring for children. To use a very basic example, in this chapter, self-selection into non-employment is studied. The analysis here applies to Great Britain, as complete employment histories were available from the British data. In previous analyses, non-employment was consistently found to have a positive effect on first birth risks. The interpretation was that women who are not employed have particularly low opportunity costs of having children. Therefore, due to their specific employment status, they are more likely to decide to have a first child. Especially in older cohorts though, very family-oriented women may have already left the labor force in anticipation of having children in the near future. To see whether there is any indication of this kind of a process, a model for first conception risks and a model for the transition from employment to non-employment were run simultaneously. Employment episodes in the model for the risk of entry into non-employment were censored at first birth. These models were estimated separately for cohorts 1895-1939, cohorts 1940-1959, and cohorts 1960-1984. There was no significant correlation of unobserved characteristics between the two models for cohorts 1940-1959 and cohorts 1960-1984. This is not so surprising, since it has become much less common for women to leave the labor market early on when they do not even have children yet. For the oldest cohorts, though, there was significant correlation between unobserved characteristics in the two models. Table 9.1 shows results for cohorts 1895-1939.

In model 1, first birth risks for women who are not employed are estimated to be 2.2 times higher than for women who are employed full-time. Factors that are found to be important for entry into non-employment, as can be seen in the second part of table 9.1, are partnership status, age, employment duration and cohort. In

model 1, education was not found to have a significant effect on entry into non-employment, possibly because not many women had a high level of education in these cohorts.

When controlling for unobserved heterogeneity in model 2 of table 9.1, the effect of non-employment on first birth risks increases. The positive effects of part-time employment and of having no educational degree also increase. These results are quite different than what had been expected. It had been expected that unobserved characteristics such as family-orientedness would be positively correlated both with non-employment and with first birth risks. Controlling for unobserved heterogeneity then should have reduced the effect of non-employment on first birth risks. However, the opposite is the case. Possibly, other unobserved characteristics than those that had been expected are dominant. A presumption might be that the family's economic resources are important unobserved characteristics that are controlled for in the second model. Women's non-employment, part-time employment, and low level of education are likely to be correlated with generally poor economic resources of their family. If family income is low, the decision to have a first child will be more difficult. But, when this factor is controlled for, the positive effects of low opportunity costs of being non-employed, part-time employed, or having a low level of education show up more clearly.

In the third model, the correlation between unobserved heterogeneity in the two equations is controlled for. Now, the effect of non-employment on first birth risks decreases again slightly. The decline is not very large, and first birth risks for women who are not employed are still 2.5 times higher than for those who are employed full-time. To a small extent, the effect of non-employment on first birth risk can thus be explained by unobserved characteristics that are also important for the transition from full-time employment to non-employment. An important characteristic among these could be, as hypothesized, the degree of family-orientedness. Whatever the unobserved characteristics are, though, they can hardly explain the strong effect of non-employment on first birth risks. To conclude, then, not even for cohorts 1895-1939 did a high degree of preferences for children apparently lead both to leaving the labor market and to quicker transition to the first child, to any extent that could explain the strong positive effect of non-employment on first birth risks. Instead, the results seem to better support hypotheses of straight-forward effects of opportunity costs on first birth risks.

**Table 9.1: Simultaneous estimation of models for risk of first birth and for risk of entry into non-employment**  
**Estimates are log relative risks**

	model 1	model 2	model 3
<i>risk of first birth equation</i>			
<b>constant</b>	-7.980 ***	-8.649 ***	-8.674 ***
<b>age</b>			
<i>slopes</i>			
16-18	0.081 ***	0.077 ***	0.076 ***
18-25	-0.003 *	0.004 *	0.005 **
25-30	-0.007 ***	0.000	0.001
30-45	-0.017 ***	-0.015 ***	-0.015 ***
<b>partnership status</b>			
<i>no partner</i>	0	0	0
union (marr. or coh.)	2.122 ***	2.033 ***	2.047 ***
married (additive)	0.306	0.789 *	0.777
<b>employment status</b>			
<i>full-time</i>	0	0	0
part-time employed	0.169	0.439 ***	0.416 ***
self-employed	0.299	0.328	0.301
not employed	0.775 ***	1.073 ***	0.917 ***
other empl. status	-0.125	-0.109	-0.154
In education	-1.723 ***	-1.611 **	-1.601 **
<b>work experience</b>	-0.007 ***	-0.002	-0.004
<b>cohort</b>			
1895-1909	-0.137	-0.407 **	-0.384 **
1910-1919	-0.321 ***	-0.637 ***	-0.619 ***
1920-1929	-0.226 ***	-0.437 ***	-0.438 ***
1930-1939	0	0	0
<b>education</b>			
no degree	0.097	0.316 **	0.335 **
<i>medium</i>	0	0	0
high	0.090	0.117	0.115

*(table continued next page)*

(table 9.1 continued)

	Model 1	Model 2	Model 3
<i>entry into non-employment equation</i>			
<b>constant</b>	-7.164 ***	-7.450 ***	-7.470 ***
<b>age</b>			
<i>slopes</i>			
16-18	0.029	0.020	0.021
18-25	0.016 ***	0.017 ***	0.018 ***
25-45	-0.008 ***	-0.007 ***	-0.007 ***
<b>partnership status</b>			
<i>no partner</i>	0	0	0
union	1.039 **	1.324 ***	1.347 ***
married	-0.728 *	-0.971 **	-0.908 *
<b>full-time employment duration</b>			
<i>slopes</i>			
0-1 year	-0.071	-0.065	-0.065
1-2 years	0.070 ***	0.079 ***	0.079 ***
2+ years	-0.003 **	-0.001	-0.001
<b>employment status</b> (reference category: beginning of full-time employment)			
part-time employed	-0.304	-0.093	-0.069
self-employed	-0.474	-0.321	-0.309
<b>work experience</b>	0.008 **	0.004	0.005
<b>cohort</b>			
1895-1909	0.494 ***	0.567 **	0.542 **
1910-1919	0.452 ***	0.542 ***	0.502 ***
1920-1929	0.099	0.113	0.079
1930-1939	0	0	0
<b>education</b>			
no degree	0.031	0.031	0.060
<i>medium</i>	0	0	0
high	-0.374	-0.438	-0.447 *
<b>Standard deviation of the heterogeneity distribution for the first conception model</b>		1.095 ***	1.119 ***
<b>Standard deviation of the heterogeneity distribution for the employment to non-employment model</b>		0.757 ***	0.770 ***
<b>Correlation</b>			0.302 *

\*\*\*:  $p < 0.01$ ; \*\*:  $0.01 \leq p < 0.05$ ; \*:  $0.05 \leq p < 0.1$

## Chapter 10

### Conclusion

This study has compared the effect of employment characteristics on transitions to the first child in Great Britain and western Germany. The welfare state and labor market contexts in the two countries diverge quite strongly, shaping the impact of economic factors on decisions to have a first child in distinct ways. An attribute that the two countries have in common is a poor childcare infrastructure. This makes parenthood and employment very difficult to combine. In Germany, the taxation system makes it financially easier for families to react to this by assuming a traditional division of labor. In addition, in Germany, there are very extensive parental leave provisions. In Great Britain, leave durations are typically shorter, and there are no tax benefits for single-earner married couples as there are in Germany. Therefore, employment arrangements that are compatible with caring for children may be more important in Britain.

When people make decisions about having a first child, they will typically take into account whether their economic resources enable them to support their child. They will also consider the consequences of having children for their future career outcomes. Classical economic fertility theories indicate which factors may influence decisions to have a child in a male breadwinner context. These theories postulate that the decision to have a child tends to become easier the higher income and career resources a man has. For women, on the other hand, an effect in the opposite direction is predicted, as these variables translate into opportunity costs in contexts where women give up or interrupt their paid work to take care of their children. Hypotheses based on this model have very often been tested in empirical studies. In the theoretical literature however, classical economic theories of fertility are not quite as straightforward as just presented, as we pointed out in chapter 3. Nonetheless, the model outlined above has become quite well established in the empirical literature as a framework against which to track changes in the relationship between men's and women's education, employment, and family formation.

Opportunity cost considerations can be assumed to be important for women in both countries. Mothers in Britain tend to return to work much more quickly than in

western Germany. On the other hand, part-time work, to which a large proportion of mothers return in both countries, is less well paid in Britain than in western Germany. So, opportunity costs of motherhood can be substantial in western Germany because of long work interruptions, and in Great Britain because of extended times in poorly paid part-time work. In Great Britain, though, one might presume opportunity cost considerations to be less important for women with very high earnings. Making use of childcare is socially better accepted in Great Britain, though it is usually quite expensive. Women with very high income may be better able to afford childcare, and in that manner avoid long durations of absence from employment. Thus, a U-shaped effect of women's earnings, reflecting opportunity cost considerations across the first half of the income distribution, and positive income effects across the second, would be possible for women in Great Britain. The ability to support their family can be taken to be important for fathers in both countries. They are unlikely to be affected by opportunity costs, and will often have to support their partner as well if she interrupts or reduces employment. Stronger effects of men's career resources and position in the income distribution can be expected for Britain than for western Germany. This is because, in contrast to Germany, there is no public financial support for couples with very unequal earnings. Additionally, income inequality is higher in Great Britain, implying greater income differences in real terms between people with different positions in the income distribution.

Seen from a life-course perspective, classical economic theories of fertility postulate different directions of causality between the employment and family spheres of the life course for men and women. Men's employment characteristics are seen to influence fertility, but there is very little causality running in the opposite direction, from fatherhood back to men's employment situation<sup>41</sup>. However, strong effects of motherhood on employment outcomes are expected. It is the anticipation of these effects of childbearing on employment that is taken to affect fertility. In contexts where it is common to make use of family-friendly employment arrangements, such as flexible employment schedules, though, parenthood can be expected to affect one's employment situation less strongly. There is still an impact of the family sphere of the life course on employment, but the link is weaker. Consequently, there is also less of an impact on fertility of anticipated employment implications. The availability of fam-

---

<sup>41</sup> Of course, it is sometimes argued that fatherhood has a positive effect on employment outcomes, as men increase their job investments to better accommodate their breadwinner role.

ily-friendly employment arrangements may be especially important for fertility decisions in Great Britain, since parental leave durations tend to be quite short. Previous research has found that public sector employers and larger firms are more likely to provide family-friendly employment schemes. Therefore, the hypothesis is that women employed in the public sector or in large firms have higher first birth risks, particularly in Great Britain.

Family-friendly employment schemes such as flexible or part-time employment may not eliminate opportunity costs completely, however. Making use of family-friendly arrangements can lead to lower career prospects and lower income. It has been found that women in occupations requiring higher levels of qualification have better access to family-friendly arrangements. If their availability is correlated with better job resources, one may have to control for education and earnings to find an effect of family-friendliness on fertility, since better jobs also imply higher opportunity costs. Besides flexible employment arrangements, the degree to which an occupation is female-dominated can be seen to enhance the compatibility of employment and childrearing. Since mothers in female-dominated occupations are likely to receive more social support for combined roles, it is sometimes held that teachers or nurses, for instance, will be more likely to decide to have a child than women working in other occupations. They are likely to be less stigmatized in the workplace and therefore to also experience less opportunity costs, or at least less psychological distress.

A variant of classical economic fertility theories are economic theories of fertility timing. Here, too, the assumption is that motherhood implies opportunity costs for women, and that fertility is inversely related to opportunity costs. Given that mothers are absent from employment for some duration around the birth of their child and that their attainable wages depreciate to some extent during employment interruptions, it can be shown that life-time earnings are raised by postponing first birth across time in employment. Following this theory, one hypothesis is that time in employment will have a positive effect on first birth risks.

Qualitative studies, for example by Ranson (1998), have shown that women often decide to wait until they have achieved some employment security or have advanced to a certain level before deciding to have a first child. In this sense, gathering employment experience can be seen as a way to avoid the loss of employment opportunities over childbirth, and thus decrease the friction between employment and parenthood. These considerations lead to the same conclusion as classical economic theo-

ries of fertility timing, which is that the amount of time one has spent in employment will have a positive effect on transitions to the first child.

Support was found for predictions based on classical economic theories of fertility with respect to the effects of men's characteristics on the transition to the first child. In both countries, first birth risks increased with the height of women's partner's earnings. Risks of transition to the first child were also augmented by the partner working long hours, even independent of earnings. Long work hours may be an indicator of future career potential. The partner working in unqualified occupations led to lower risks of transition to the first child, compared to all other occupations, for women in both countries. As was expected, the effect of men's career resources was stronger in Great Britain than in western Germany. Higher risks of poverty in Great Britain may also be reflected in the finding that in economically insecure situations, men's level of education is important for first birth transitions. This was found to be the case during times of high unemployment in the early 1990s, as well as among the self-employed.

No support was found for the hypothesis that opportunity cost considerations would be the dominating link between women's employment and fertility in western Germany. Rather, a U-shaped effect was found for earnings. This could be interpreted to indicate a prevalence of opportunity cost considerations across the first half of the income distribution and positive income effects across the second half. This type of an effect could be a result of the better ability of women with higher income to afford childcare. However, because the age at completion of university education is usually quite high in western Germany, the elevated risks of first birth for women at the upper end of the income distribution may just reflect a time-squeeze. In Great Britain, by contrast, where this type of a U-shaped effect was expected, it turned out to be less pronounced than in western Germany. Lowest first birth risks were found in the fourth quintile, instead of the third like in western Germany. A reason may be differences in the income distribution between the two countries. Women with earnings in the fourth quintile earn less in real terms in Great Britain than in western Germany. Along a different dimension there seems to be more evidence of opportunity cost considerations in western Germany than in Great Britain. Long work hours reduced first birth risks for women in western Germany, but not in Great Britain. This was found especially for occupational groups that tend to take long durations of parental leave in western

Germany. If long work hours are an indicator of career prospects, they may translate into opportunity costs if parental leave durations are long.

A straight-forward positive effect of firm size on first birth risks was found for Great Britain. This supports the hypothesis that the compatibility of childcare and employment is important there, since larger firms are better able to provide family-friendly employment schemes. No clear pattern except a weak negative effect of working in a medium-sized firm was found for western Germany. In the latter country, the compatibility of work and raising children may not be as important for fertility decisions, since parental leave durations are very long.

In contrast to what we expected, no effect of public sector employment was found for either country. To see whether working in female-dominated occupations had an effect on first birth transitions, indicators for working as a teacher and working as a nurse were added. Teachers were found to have higher first birth risks than other professionals in western Germany, but not in Great Britain. An explanation may be that, in addition to social support from female colleagues, teachers in western Germany have extremely secure life-time contracts. Working as a nurse did not increase first birth risks compared to other associate professionals in either country. Working in a female-dominated occupation by itself may not be enough to influence first birth risks in western Germany or Great Britain.

We studied the effect of duration of continuous full-time employment on first birth risks for Great Britain, as it was possible to obtain complete employment histories from the British data. First birth risks were found to rise with continuous full-time employment duration, as hypothesized. The increase in first birth risks was especially strong across the first year of employment. An explanation may be that people are especially inclined to postpone first birth while they are still insecure about their employment conditions.

When eligibility for maternity leave is linked to employer tenure, the timing of childbearing becomes especially important for combining employment and childcare. In Britain, until very recently, one had to have acquired a certain amount of employer tenure to qualify for maternity leave. By testing for effects of employer tenure on first birth risks, we showed that women adjusted the timing of first births to fit eligibility requirements during times when most elements of maternity leave were still conditional on tenure.

To summarize, it seems that first birth risks are the higher the weaker the impact of parenthood on the employment sphere of the life course. This especially applies to the effect of firm size in Britain. The ability of large firms to provide a family-friendly arrangement seems to be more important than in western Germany, as mothers in Britain return to work more quickly. The U-shaped effect of income on first birth risks in western Germany could be interpreted to show that motherhood affects the employment situation of women with higher income less than is the case for women with medium income. This may be the case if women with higher income are more inclined to purchase childcare. The U-shaped income effect could also be the result of the beginning of a transition from male breadwinner to dual earner families. On the other hand, the income effect that was found for western Germany could just be the result of a time-squeeze. In any case, differences in first birth patterns between women with low and medium career prospects still seem to follow predictions of classical economic fertility theories, as indicated by the negative effect of income on first birth risks across the first half of the income distribution. Women with the lowest career prospects, such as service and manual workers, also have very high first birth risks in comparison to other occupations in both countries. Additionally, career resources that cannot be measured by earnings seem to reduce first birth risks in western Germany. Long work hours can be an indicator of future career prospects. These lead to lower first birth risks independent of income in western Germany, where in contrast to Great Britain work interruptions are very long and women may not be able to return to work quickly in critical early phases of their career. The impact of fatherhood on employment outcomes has in the past been weak, or in any case, not negative. Men in western Germany and Great Britain still seem to anticipate little influence of the family on the employment sphere of their lives. Instead, as predicted by classical economic theories of fertility, men's career resources have a positive effect on first birth risks. For men, the direction of causality is thus from employment resources to fertility, but no effect in the opposite direction is expected. Effects are stronger in Great Britain than in western Germany, presumably because of less financial support for male breadwinner families and more income inequality.

If provision of childcare for young children improves in Great Britain and western Germany, this can weaken the impact of parenthood on employment outcomes. Affordable childcare is probably the most important way to reduce the influence of family responsibilities on work. None-the-less, it is unlikely that ones em-

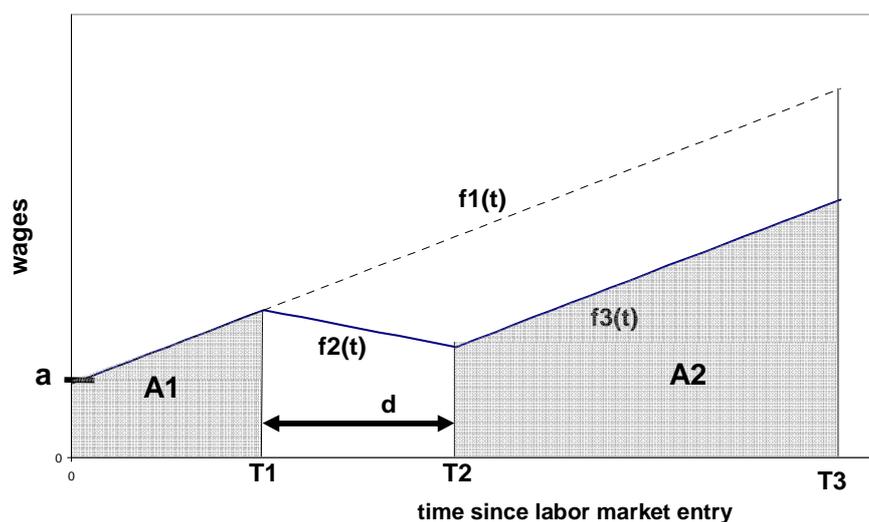
ployment situation will remain completely unaffected by raising children. Therefore, even given more extensive childcare, family-friendly arrangements such as flexible work schedules can be expected to further contribute to weakening the link from parenthood to employment, thereby making the decision to have a first child easier. In the short run, if times of employment interruptions become shorter in western Germany and approach British patterns, the importance of family-friendly employment arrangements for transitions to the first child could increase in western Germany. Characteristics like the length of employment experience may remain important to some extent even if childcare becomes more readily available. If there is at least some length of employment interruption around childbirth, or if mothers face stigmatization independent of taking leave, women may want to establish a certain degree of employment security before having children to decrease the likelihood of downward occupational mobility. Thus, the effect of specific characteristics of the work situation on reducing the opportunity costs of parenthood may lose significance if childcare is improved, but it is unlikely that they will become completely irrelevant.

## Appendix

### A.3 Appendix for chapter 3

Figure A3.1 illustrates a model of linear wage appreciation and depreciation. The first segment of the wage function is given by  $f_1$ , which would also represent the development of wages over the whole time period if there were no interruption. The function for wage depreciation during absence from the labor market is  $f_2$ . Finally, wage development in the period after labor market reentry is given by  $f_3$ , for which the same gradient is assumed as for  $f_1$ .

**Figure A1: wages do not completely depreciate**



The functions are defined as below:

$$f_1(t) = a + b_1 t$$

$$f_2(t) = u + b_2 t = a - T_1 * (b_2 - b_1) + b_2 t$$

$$f_3(t) = v + b_1 t = a + (b_2 - b_1) * (T_2 - T_1) + b_1 t$$

Life-time earnings,  $E$ , are given by the sum of the areas  $A_1$  and  $A_2$ .

$$A_1 = \int_0^{T_1} f_1(t) dt = aT_1 + \frac{1}{2}b_1T_1^2$$

$$A_2 = \int_{T_2}^{T_3} f_3(t) dt = (a + (b_2 - b_1)(T_2 - T_1)) * (T_3 - T_2) + \frac{1}{2}b_1 * (T_3^2 - T_2^2)$$

$$E = A_1 + A_2 = -a(T_2 - T_1) + \frac{1}{2}b_1T_1^2 - \frac{1}{2}b_1T_2^2 + (b_2 - b_1)T_3(T_2 - T_1) - (b_2 - b_1)T_2^2 + (b_2 - b_1)T_1T_2 + \frac{1}{2}b_1T_3^2 + aT_3$$

defining:  $d=T_2-T_1$

$T_2-T_1$  is replaced by  $d$ , for the duration of absence from the labor market. In this manner, one can see what effect timing, represented by  $T_2$ , has when the duration,  $d$ , is held constant.

Life-time earnings:

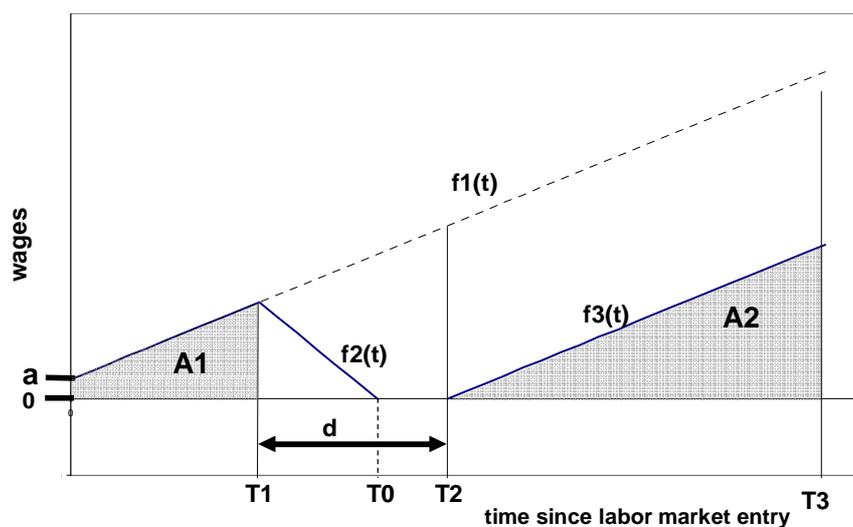
$$E = -b_2dT_2 + \frac{1}{2}b_1d^2 - a*d + (b_2 - b_1)T_3 * d + \frac{1}{2}b_1T_3^2 + aT_3$$

The effect of birth timing on life-time earnings:

$$\frac{\partial E}{\partial T_2} = -b_2d$$

Thus, the effect of  $T_2$  on life-time earnings is positive (since the wage gradient during absence ( $b_2$ ) is always negative). In other words, later birth timing leads to higher life-time earnings. The positive effect of birth timing on life-time earnings is stronger for longer durations of absence from the labor market as well as higher rates of wage depreciation during absence. One can also see here that there is zero effect of birth timing on life-timing earnings if either the rate of wage depreciation during absence or the length of absence from the labor market is zero.

Figure A2: wages depreciate completely during absence



$$T_0 = \frac{-a + T_1 * (b_2 - b_1)}{b_2}$$

The second scenario applies whenever  $T_0$  is smaller than  $T_2$ .

$$T_0 < T_2$$

$$\Leftrightarrow T_2 < \frac{-d * (b_2 - b_1) - a}{b_1}$$

( $b_2$  is always negative;  $d = T_2 - T_1$ )

When wages depreciate completely during absence from the labor market, that is, as soon as  $T_2$  is smaller than the value given above, the second scenario applies and a different formula for life-time earnings is needed.

The functions  $f_1(t)$  and  $f_2(t)$  are still the same as in the first scenario, but the function  $f_3(t)$  is different:

$$f_3(t) = -b_1 T_2 + b_1 t$$

The formula for  $A_2$  changes accordingly:

$$A_2 = \int_{T_2}^{T_3} f_3(t) dt = -b_1 T_2 * (T_3 - T_2) + \frac{1}{2} b_1 * (T_3^2 - T_2^2)$$

$$E = A_1 + A_2 = T_2(a + b_1(T_2 - T_3 - d)) - ad + \frac{1}{2} b_1 d^2 + \frac{1}{2} b_1 T_3^2$$

$$\frac{\partial E}{\partial T_2} = 2b_1 T_2 + a - b_1(T_3 + d)$$

To get the overall effect of first birth timing on life-time earnings, one needs to combine the results for the first scenario with the results for the second scenario. One switches from one function of  $T_2$  to the other in dependence of the value of  $T_2$  itself. As shown earlier, the second scenario applies as long as:

$$T_2 < \frac{-d * (b_2 - b_1) - a}{b_1}$$

While this is the case, the effect of birth timing on life-time earnings is:

$$\frac{\partial E}{\partial T_2} = 2b_1 T_2 + a - b_1(T_3 + d)$$

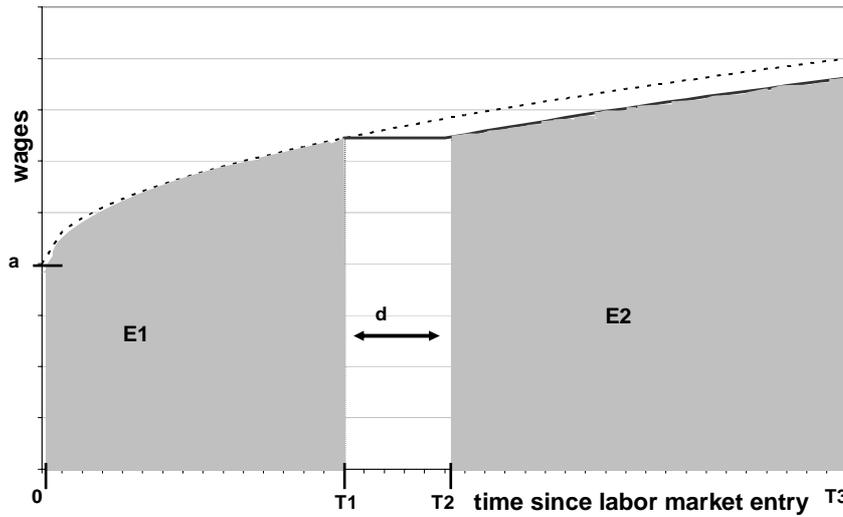
As soon as  $T_2$  is larger than the threshold

$$T_2 \geq \frac{-d * (b_2 - b_1) - a}{b_1}$$

the first scenario applies, and the effect of timing ( $T_2$ ) on life-time earnings is given by the following :

$$\frac{\partial E}{\partial T_2} = -b_2 d$$

Figure A3: skill appreciation slows with time



The wage function before the break

$$w_1(t) = a + b * t^c$$

where  $0 < c < 1$

The wage function after the break

$$\begin{aligned} w_2(t) &= w_1(t) - (w_1(T_2) - w_1(T_1)) \\ &= a + b * ((T_2 - d)^c - T_2^c) + b * t^c \end{aligned}$$

Life-time earnings as the area under the curve

$$\begin{aligned} E &= E_1 + E_2 = \int_0^{T_1} w_1(t) dt + \int_{T_2}^{T_3} w_2(t) dt \\ &= \frac{b}{c+1} * (T_2 - d)^{c+1} - \frac{b}{c+1} * T_2^{c+1} + b T_3 (T_2 - d)^c \\ &\quad - b T_2 (T_2 - d)^c - b T_3 T_2^c + b T_2^{c+1} + a(T_3 - d) + \frac{b}{c+1} * T_3^{c+1} \end{aligned}$$

The effect of timing of employment interruption on life-time earnings:

$$\frac{\partial E}{\partial T_2} = cb(T_3 - T_2)((T_2 - d)^{c-1} - T_2^{c-1})$$

The effect of later birth timing on life-time earnings is positive:

$$cb(T_3 - T_2) > 0$$

$$(T_2 - d)^{c-1} - T_2^{c-1} > 0 \text{ (} c \text{ is smaller than 1)}$$

The longer the break ( $d$ ), the more important is timing for life-time earnings.

## A.7 Appendix for chapter 7

Figure A7.1

Great Britain: effects of education and age without interaction effect

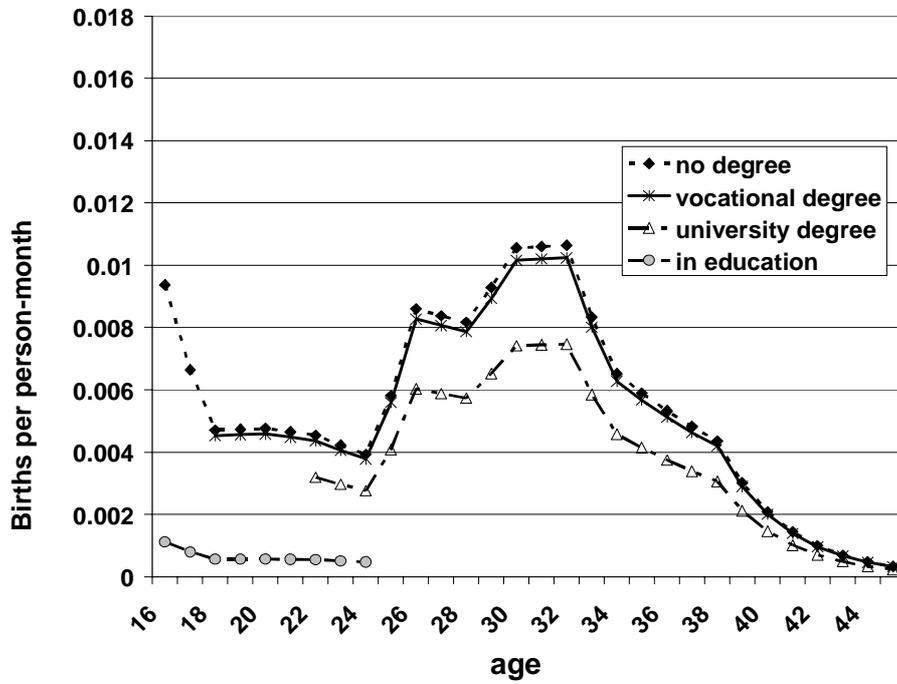


Figure A7.2

Great Britain: interaction of education and age

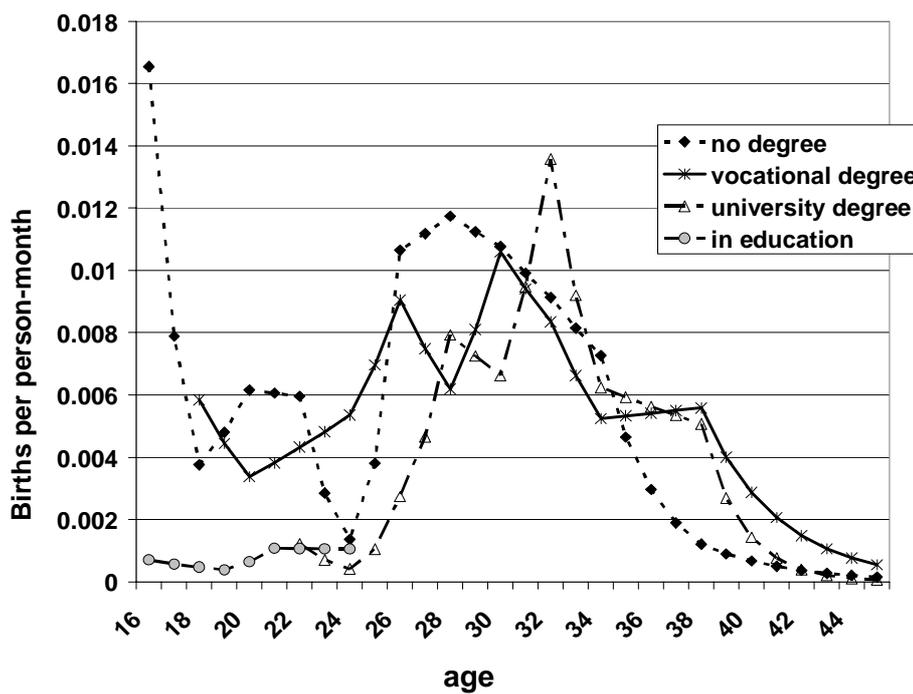


Figure A7.3

Western Germany: effects of education and age without interaction effect

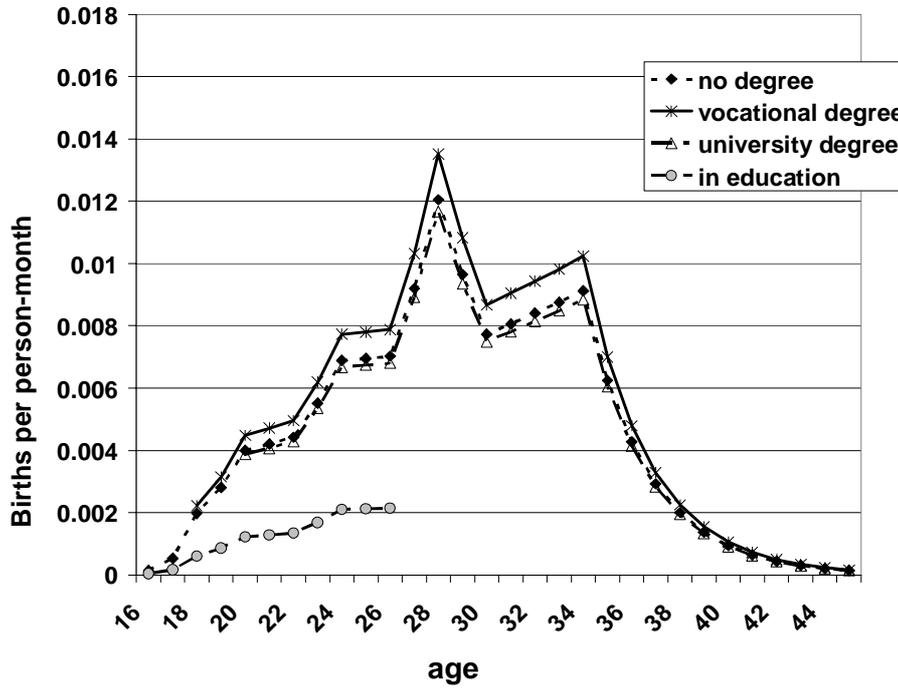
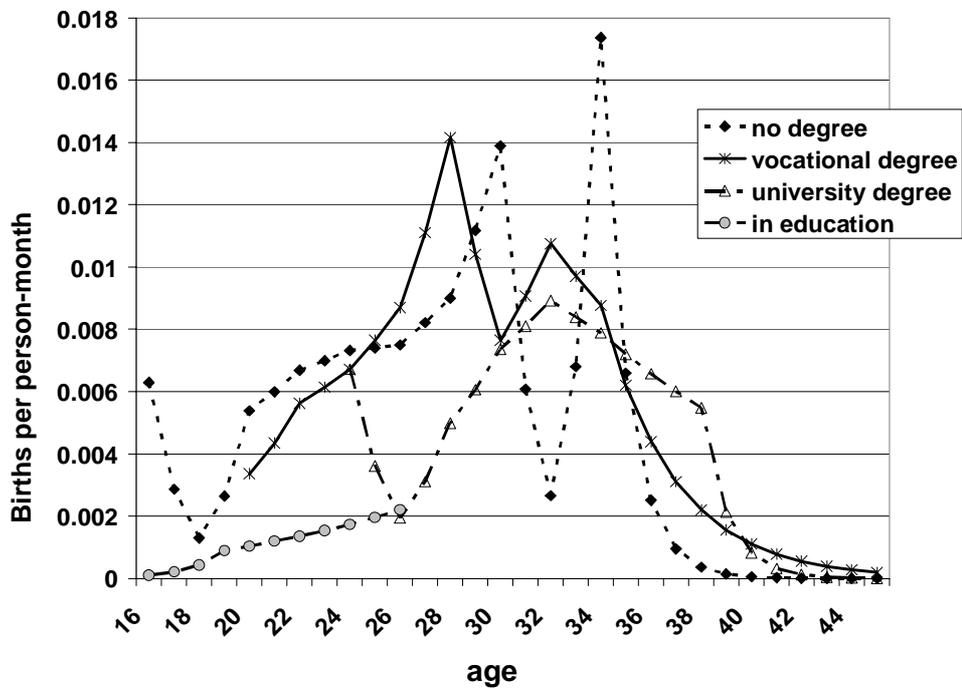


Figure A7.4

Western Germany: interaction of education and age



## references

- Adam, Stuart. 2004. A Survey of UK Tax System. *The Institute for Fiscal Studies. Briefing Note 9*.
- Andersson, Gunnar. 2000. The Impact of Labour-Force Participation on Childbearing Behaviour: Pro-Cyclical Fertility in Sweden During the 1980s and the 1990s. *European Journal of Population* 16: 293-333.
- Barnett, Rosalind Chait, Judith R. Gordon, Karen C. Gareis, and Claudia Morgan. 2004. Unintended Consequences of Job Redesign: Psychological Contract Violations and Turnover Intentions Among Full-time and Reduced-Hours MDs and LPNs. *Community, Work & Family* 7, no. 2: 227-46.
- Becker, Gary S. 1960. An Economic Analysis of Fertility. *Demographic and Economic Change in Developed Countries: A Conference of the Universities - National Bureau Committee for Economic Research. Special Conference Series, No. 11*. National Bureau of Economic Research, 209-31. Princeton: Princeton University Press.
- . 1965. "A Theory of the Allocation of Time." *The Economic Journal* 75(299):493-517.
- . 1985. Human Capital, Effort, and the Sexual Division of Labor. *Journal of Labor Economics* 3, no. 1, Part 2: 33-58.
- . 1993a. The Demand for Children. *A Treatise on the Family*. enlarged edition ed., Gary S. Becker, 135-54. Cambridge, Mass.: Harvard University Press.
- . 1993b. The Evolution of the Family. *A Treatise on the Family*. enlarged edition ed., Gary S. Becker, 342-61. Cambridge, Mass.: Harvard University Press.
- Bell, Alice, and Steven Finch. 2004. Sixth Survey of Parents of Three and Four Year Old Children and their use of early years services. *National Centre for Social Research. Department for Education and Skills. Research Report RR525*.
- Bender, Stefan, Annette Kohlmann, and Stefan Lang. 2003. Women, Work, and Motherhood: Changing Employment Penalties for Motherhood in West Germany after 1945 - A Comparative Analysis of Cohorts Born in 1934-1971. *MPIDR Working Paper WP* , no. 006.
- Bernhardt, Eva M. 1972. Fertility and Economic Status - Some Recent Findings on Differentials in Sweden. *Population Studies* 26, no. 2: 175-84.
- Berth, Felix. 2006. Zusätzliche Ersparnis. Drei Beispiele zur Absetzbarkeit der Kinderbetreuungskosten. *Süddeutsche Zeitung* 26, 1/2/06: 5.
- Biewen, Martin. 2000. Income Inequality in Germany During the 1980s and 1990s. *Review of Income and Wealth* 46, no. 1: 1-19.
- Black, B., M. Trainor, and J. E. Spencer. 1999. Wage Protection Systems, Segregation and Gender Pay Inequalities: West Germany, the Netherlands and Great Britain. *Cambridge Journal of Economics* 23, no. .: 449-64.
- Blackburn, McKinley L., David E. Bloom, and David Neumark. 1993. Fertility Timing, Wages, and Human Capital. *Journal of Population Economics* 6: 1-30.
- Blossfeld, Hans-Peter, and Johannes Huinink. 1991. Human Capital Investments or Norms of Role Transitions? How Women's Schooling and Career Affect the Process of Family Formation. *American Journal of Sociology* 97, no. 1: 143-68.

- Brewer, Mike, Alissa Goodman, Jonathan Shaw, and Andrew Shepard. 2005. Poverty and Inequality in Britain: 2005. *The Institute for Fiscal Studies. Commentary No. 99.*
- Budig, Michelle J., and Paula England. 2001. The Wage Penalty for Motherhood. *American Sociological Review* 66: 204-25.
- Bundesgesetzblatt G5702. 2004. Gesetz zum qualitätsorientierten und bedarfsgerechten Ausbau der Tagesbetreuung für Kinder (Tagesbetreuungsausbaugesetz TAG). Vom 27. Dezember 2004. 1, no. 76, ausgegeben zu Bonn am 31. Dezember 2004.
- Bundesministerium der Finanzen. 2005. *Datensammlung zur Steuerpolitik.*
- Bundesministerium für Familie, Senioren Frauen und Jugend. 2004. *A bis Z zum Tagesbetreuungsbaugesetz.*
- Bundesministerium für Familie, Senioren Frauen und Jugend ed. 2001. *Gerechtigkeit für Familien. Zur Begründung und Weiterentwicklung des Familienlasten- und Leistungsausgleichs.* Stuttgart.
- Bundesministerium für Familie, Senioren Frauen und Jugend. Rede der Bundesministerin für Familie, Senioren, Frauen, und Jugend, Ursula von der Leyen, am 1. Dezember 2005 vor dem Deutschen Bundestag, Berlin. *Redeabdruck, [Http://Www.Bmfefj.De/Kategorien/Reden](http://www.bmfsfj.de/Kategorien/Reden).*
- . 2005. *Staatlich Hilfe für Familien.*
- Bundesrat. 2001. Kindergeld kann zum 1. Januar 2002 in Kraft treten. *Pressemitteilung. [Www.Bundesrat.De](http://www.bundesrat.de) 159.*
- Bundesregierung. *Lebenslagen in Deutschland. Der 2. Armuts- und Reichtumsbericht der Bundesregierung.*
- Butz, William P., and Michael P. Ward. 1979. The Emergence of Countercyclical U.S. Fertility. *The American Economic Review* 69, no. 3: 318-28.
- Cain, Glen G., and Adriana Weininger. 1973. Economic Determinants of Fertility: Results from Cross-Sectional Aggregate Data. *Demography* 10, no. 2: 205-23.
- Carr, Deborah. 2002. The Psychological Consequences of Work-Family Trade-Offs for Three Cohorts of Men and Women. *Social Psychology Quarterly* 65, no. 2: 103-24.
- Cigno, Alessandro, and John Ermisch. 1989. A Microeconomic Analysis of the Timing of Births. *European Economic Review* 33: 737-60.
- Connelly, Rachel. 1992. Self-Employment and Providing Child Care. *Demography* 29, no. 1: 17-29.
- Daly, Mary. 2000. *The Gender Division of Welfare. The Impact of the British and German Welfare States.* Cambridge.
- de Bruijn, B. J. 1999. *Foundations of Demographic Theory.* Groningen.
- den Dulk, Laura. 2005. Workplace Work-Family Arrangements: A Study and Explanatory Framework of Differences Between Organizational Provisions in Different Welfare States. *Work and Family.* Steven A. Y. Poelmans, 211-38. Mahwah, New Jersey; London.
- Department for Education and Employment. 1998. *A New Contract For Welfare: The Gateway to work. Cm4102.*
- Department for Education and Skills. 2001. Statistics of Education: Children's Day Care Facilities at 31 March 2001 England. *National Statistics Bulletin* 8, no. 1.

- Department for Work and Pensions. 2004. Appendix 2. *Households Below Average Income 1994/95 - 2002/03.*, 235-46. <http://www.dwp.gov.uk/asd/hbai/hbai2003/contents.asp>.
- Department of Trade and Industry. 2002. Maternity Rights. A Guide for Employers and Employees. PL 958, no. (Rev 7).
- . 2003. Maternity Rights. A Guide for Employers and Employees. Babies Due on or after April 6 2003. PL 958, no. (Rev 9).
- Deutsche Bundesbank [http://Www.Bundesbank.De/Statistik/Statistik\\_Zeitreihen.Php](http://Www.Bundesbank.De/Statistik/Statistik_Zeitreihen.Php).
- Dex, Shirley, Heather Joshi, and Susan Macran. 1996. A Widening Gulf Among Britain's Mothers. *Oxford Review of Economic Policy* 12, no. 1: 65-75.
- Dilnot, Andrew, and Julian McCrae. 2000. The Family Credit System and the Working Family Tax Credit in the United Kingdom. *OECD Economic Studies* 31, no. 2: 69-84.
- Duesenberry, James S. 1960. Comment on Becker: An Economic Analysis of Fertility. *Demographic and Economic Change in Developed Countries*. National Bureau of Economic Research, 231-34. Princeton.
- Duncan, Alan, Gillian Paull, and Jayne Taylor. 2001. Mother's Employment and the Use of Childcare in the United Kingdom. *The Institute for Fiscal Studies* , no. WP01/23.
- Easterlin, Richard A. 1987. *Birth and Fortune. The Impact of Numbers on Personal Welfare*. Chicago & London.
- Edwards, Mark Evan. 2002. Education and Occupations: Reexamining the Conventional Wisdom About Later First Births Among American Married Mothers. *Sociological Forum* 17, no. 3: 423-43.
- Ekert-Jaffé, Olivia, Heather Joshi, Kevin Lynch, Rémi Mougin, and Michael Rendall. 2002. Fertility, Timing of Births and Socio-Economic Status in France and Britain: Social Policies and Occupational Polarization. *Population (English Edition)* 3: 475-506.
- Elder Jr., Glen H. 1975. Age Differentiation and the Life Course. *Annual Review of Sociology* 1: 165-90.
- Elliott, Jane. 2005. Comparing Occupational Segregation in Great Britain and the United States: The Benefits of Using a Multi-Group Measure of Segregation. *Work, Employment and Society* 19, no. 1: 153-74.
- England, Paula. 1984. Wage Appreciation and Depreciation: A Test of Neoclassical Economic Explanations of Occupational Sex Segregation. *Social Forces* 62, no. 3: 726-49.
- Ermisch, John F. 1989. Purchased Child Care, Optimal Family Size and Mother's Employment. *Journal of Population Economics* 2: 79-102.
- Espenshade, Thomas J. 1972. The Price of Children and Socio-Economic Theories of Fertility. *Population Studies* 26, no. 2: 207-21.
- European Commission. 2002a. Family Benefits and Family Policies in Europe. *MISSOC-Info* 2002, no. 1.
- . 2002b. MISSOC Comparative Tables on Social Protection in the Member States. Maternity. [http://europa.eu.int/comm/employment\\_social/missoc/2002/uk\\_part4\\_en.htm](http://europa.eu.int/comm/employment_social/missoc/2002/uk_part4_en.htm).
- Evans, John M. 2001. Firms' Contribution to the Reconciliation Between Work and Family Life. *Labour Market and Social Policy Occasional Papers, OECD*, no. 48.

- Evers, Adalbert, Jane Lewis, and Birgit Riedel. 2005. Developing child-care provision in England and Germany: problems of governance. *Journal of European Social Policy* 15 , no. 3: 195-209.
- Fagan, Colette, and Jill Rubery. 1996. The Saliency of the Part-Time Divide in the European Union. *European Sociological Review* 12, no. 3: 227-50.
- Francesconi, Marco, and Katrin Golsch. 2005. The Process of Globalization and Transitions to Adulthood in Britain. *Globalization, Uncertainty and Youth in Society*. Hans-Peter Blossfeld , Eric Klijzing, and Melinda Mills, 249-76. Routledge.
- Freedland, M. R. 1976. The Employment Protection Act 1975. Individual Aspects. *The Modern Law Review* 39, no. 5: 561-74.
- Fried, Nico, and Gregor Schiegl. 2006. Einigung in der Familienpolitik. *Süddeutsche Zeitung* 26, 1/2/06: 5.
- Förster, Michael. 2000. Trends and Driving Factors in Income Distribution and Poverty in the OECD Area. *OECD Labour Market and Social Policy Occasional Papers* 42 .
- Geisler, Esther, and Michaela Kreyenfeld. 2005. Müttererwerbstätigkeit in Ost- und Westdeutschland. Eine Analyse mit den Mikrozensus 1991-2002. *Beitrag Zur 4. Nutzerkonferenz "Forschung Mit Dem Mikrozensus: Analysen Zur Sozialstruktur Und Zum Arbeitsmarkt"* .
- Glass, Jennifer, and Valerie Camarigg. 1992. Gender, Parenthood, and Job-Family Compatibility. *American Journal of Sociology* 98, no. 1: 131-51.
- Gregg, Paul, Maria Gutiérrez-Domenech, and Jane Waldfogel. 2003. The Employment of Married Mothers in Great Britain: 1974-2000. *Centre for Economic Performance, London School of Economics and Political Science*.
- Gustafsson, Siv S. 2001. Optimal Age at Motherhood. Theoretical and Empirical Considerations on Postponement of Maternity in Europe. *Journal of Population Economics* 14: 225-47.
- Gustafsson, Siv S., Cécile M. M. P. Wetzels, Jan Dirk Vlasblom, and Shirley Dex. 1996. Women's Labor Force Transitions in Connection with Childbirth: A Panel Data Comparison Between Germany, Sweden and Great Britain. *Journal of Population Economics* 9: 223-46.
- Hall, Anja. 2001. Berufliche Karrieremobilität in Deutschland und Großbritannien. Gibt es Differenzen zwischen Frauen und Männern? *Die Erwerbsgesellschaft. Neue Ungleichheiten und Unsicherheiten* . Peter A. Berger, and Dirk Konietzka (eds.), 213-51. Opladen.
- Happel, S. K., J. K. Hill, and S. A. Low. 1984. An Economic Analysis of the Timing of Childbirth. *Population Studies* 38, no. 2: 299-311.
- Harkness, Susan, and Jane Waldfogel. 1999. The Family Gap in Pay: Evidence from Seven Industrialised Countries. *CASEpaper 29, ESRC Research Centre for Analysis of Social Exclusion (CASE), London School of Economics*, no. 29.
- Hillmert, Steffen. 2001. Deregulierung des Arbeitsmarktes und relative Beschäftigungschancen: Das Beispiel Großbritannien. *Die Erwerbsgesellschaft. Neue Ungleichheiten und Unsicherheiten*. Peter A. Berger, and Dirk Konietzka (eds.), 185-212. Opladen.
- . 2002. Labour Market Integration and Institutions: an Anglo-German comparison. *Work, Employment and Society* 16, no. 4: 675-701.
- Hoem, Jan M. 1986. The Impact of Education on Modern Family-Union Initiation. *European Journal of Population* 2: 113-33.

- . 2000. "Systematic Patterns of Zero Exposures in Event-History Analysis." *Sociological Methodology* 30: 237-59.
- Hoem, Jan M., Alexia Prskawetz, and Gerda Neyer. 2001. "Autonomy or Conservative Adjustment? The Effect of Public Policies and Educational Attainment on Third Births in Austria." *MPIDR Working Paper* 16.
- Hoem, Jan M., Gerda Neyer, and Gunnar Andersson. 2005. Childlessness and Educational Attainment Among Swedish Women Born in 1955-59. *MPIDR Working Paper*, no. 14.
- Hoem, Jan M. and Michaela Kreyenfeld. 2006. "Anticipatory Analysis and Its Alternatives in Life-Course Research. Part 1: Education and First Childbearing." *MPIDR Working Paper* 006(March).
- Hoereth, Ulrike, and Lars Zipfel. 2001. Eiskalt erwischt: die kalte Progression. *Ntv Steuern Transparent. Informationen zur Sendung*.
- Hotz, V. Joseph, Jacob Alex Klerman, and Robert J. Willis. 1997. The Economics of Fertility in Developed Countries. *Handbook of Population and Family Economics. Volume 1A*. Mark R. Rosenzweig, and Oded Stark, 275-347. Amsterdam.
- Huinink, Johannes. 1995a. Education, Work, and Family Patterns of Men: The Case of West Germany. *The New Role of Women. Family Formation in Modern Societies*. Hans-Peter Blossfeld. Boulder; San Francisco; Oxford.
- . 1995b. *Warum noch Familie? Zur Attraktivität von Partnerschaft und Elternschaft in unserer Gesellschaft*. Frankfurt/ New York.
- Hundley, Greg. 2001. Domestic Division of Labor and Self/ Organizationally Employed Differences in Job Attitudes and Earnings. *Journal of Family and Economic Issues* 22, no. 2: 121-39.
- Inland Revenue. 2002. *Child Tax Credit and Working Tax Credit. An Introduction. PS 721A5*.
- Jacobs, Jerry A., and Sarah E. Winslow. 2004. The Academic Life Course, Time Pressure and Gender Inequality. *Community, Work & Family* 7, no. 2: 143-61.
- Joshi, Heather. 1990. The Cash Opportunity Costs of Childbearing: An Approach to Estimation using British Data. *Population Studies* 44, no. 1: 41-60.
- . 2002. Production, Reproduction, and Education: Women, Children, and Work in a British Perspective. *Population and Development Review* 28, no. 3: 445-74.
- Joshi, Heather, Pierella Paci, and Jane Waldfogel. 1999. The Wages of Motherhood: Better or Worse? *Cambridge Journal of Economics* 23: 543-64.
- Kantorová, Vladimíra. 2004. Education and Entry into Motherhood: The Czech Republic during State Socialism and the Transition Period (1970-1997). *Demographic Research Special Collection* 3: 243-74.
- Kaufman, Gayle, and Peter Uhlenberg. 2000. The Influence of Parenthood on the Work Effort of Married Men and Women. *Social Forces* 78, no. 3: 931-47.
- Kohli, Martin. 1985. Die Institutionalisierung des Lebenslaufs. Historische Befunde und theoretische Argumente. *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 37: 1-29.
- Konietzka, Dirk, and Michaela Kreyenfeld. 2004. Angleichung oder Verfestigung von Differenzen? Geburtenentwicklung und Familienformen in Ost- und Westdeutschland. *Berliner Debatte Initial* 15, no. 4: 26-41.
- Kraval, Oystein. 1994. The Importance of Economic Activity, Economic Potential and Economic

- Resources for the Timing of First Births in Norway. *Population Studies* 48: 249-67.
- Kreyenfeld, Michaela. 2001. *Employment and Fertility - East Germany in the 1990s*. Rostock.
- Kreyenfeld, Michaela. 2002. "Parity Specific Birth Rates for West Germany: An Attempt to Combine Survey Data and Vital Statistics." *Zeitschrift Für Bevölkerungswissenschaft* 27(3):327-57.
- Kreyenfeld, Michaela. 2002. "Time-Squeeze, Partner Effect or Self-Selection? An Investigation into the Positive Effect of Women's Education on Second Birth Risks in West Germany." *Demographic Research* 7(2):13-48.
- Kreyenfeld, Michaela. 2004. Fertility Decisions in the FRG and GDR: An Analysis with Data from the German Fertility and Family Survey. *Demographic Research Special Collection* 3: 273-318.
- Kreyenfeld, Michaela. 2005. Economic Uncertainty and Fertility Postponement. Evidence from German Panel Data. *Beitrag für die Ausschussitzung des Vereins für Socialpolitik*.
- Kurz, Karin, Nikolei Steinhage, and Katrin Golsch. 2005. Case Study Germany. Global Competition, Uncertainty and the Transition to Adulthood. *Globalization, Uncertainty and Youth in Society*. Hans-Peter Blossfeld, Eric Klijzing, and Melinda Mills, 51-81. Routledge.
- Lambert, Susan J., and Anna Haley-Lock. 2004. The Organizational Stratification of Opportunities for Work-Life Balance. Addressing Issues of Equality and Social Justice in the Workplace. *Community, Work & Family* 7, no. 2: 179-95.
- Leibenstein, Harvey. 1957. Population Growth Theory and Economic Development. *Economic Backwardness and Economic Growth*. Harvey Leibenstein, 147-75. New York; London.
- Leibenstein, Harvey. 1974. An Interpretation of the Economic Theory of Fertility: Promising Path or Blind Alley? *Journal of Economic Literature* 12, no. 2: 457-79.
- Lundberg, Shelly, and Elaine Rose. 2000. Parenthood and the Earnings of Married Men and Women. *Labour Economics* 7, no. 689-710.
- Lundgren, Lena, and Rosalind C. Barnett. 2000. Reduced-Hours Careers in Medicine: A Strategy for the Professional Community and the Family. *Community, Work & Family* 3, no. 1: 66-79.
- Macunovich, Diane J. 1995. The Butz-Ward Fertility Model in the Light of More Recent Data. *The Journal of Human Resources* 30, no. 2: 229-55.
- . 1996. Relative Income and Price of Time: Exploring Their Effects on US Fertility and Female Labor Force Participation. *Population and Development Review* 22, Supplement: Fertility in the United States: New Patterns, New Theories: 223-57.
- Mayer, Karl Ulrich. 1998. Lebensverlauf. *Handwörterbuch zur Gesellschaft Deutschlands*. Bernhard Schäfers, and Wolfgang Zapf, 438-51. Opladen.
- Mayer, Karl Ulrich, and Johannes Huinink. 1990. Age, Period, and Cohort in the Study of the Life Course: A Comparison of Classical A-P-C-Analysis with Event History Analysis or Farewell to Lexis? *Data Quality in Longitudinal Research*. David Magnusson, and Lars R. Bergmann (eds.), 211-32.
- McGinnity, Frances, and Steffen Hillmert. 2004. Persisting Class Inequality? Comparing class-specific unemployment in early working life in Britain and West Germany. *European Societies* 6, no. 3: 383-408.
- McManus, Patricia A. 2004. Parents, Partners, and Credentials: Self-Employment Mobility in the United States and Germany. *Inequality Across Societies: Families, Schools and Persisting Stratification* 14: 171-200.

- McRae, Susan. 1991. *Maternity Rights in Britain*. London.
- Mincer, Jacob. 1963. Market Prices, Opportunity Costs, and Income Effects. *Measurement in Economics: Studies in Mathematical Economics and Econometrics in Memory of Yehuda Grunfeld*. C. F. et al. Christ, 67-82. Stanford.
- Mincer, Jacob, and Haim Ofek. 1982. Interrupted Work Careers: Depreciation and Restoration of Human Capital. *The Journal of Human Resources* 17, no. 1: 3-24.
- National Statistics <http://www.statistics.gov.uk/statbase/TSDdownload2.asp>.
- OECD Social Policy Division. *What Are Equivalence Scales?*  
<http://www.oecd.org/dataoecd/61/52/35411111.pdf>.
- Okun, Bernhard. 1960. Comment on Becker: An Economic Analysis of Fertility. *Demographic and Economic Change in Developed Countries*. National Bureau of Economic Research, 235-40. Princeton.
- Pascall, Gillian. 1999. UK Family Policy in the 1990s: The Case of New Labour and Lone Parents. *International Journal of Law, Policy and the Family* 13: 258-73.
- Paul, Gillian. 2003. "BHPS Employment Histories: User Guide." *Accompanying Material to BHPS Data*.
- Piachaud, David. 2001. Child Poverty. Aims, Achievements and Prospects for the Future. *New Economy*: 71-76.
- Polachek, Solomon William. 1981. Occupational Self-Selection: A Human Capital Approach to Sex Differences in Occupational Structure. *The Review of Economics and Statistics* 63, no. 1: 60-69.
- Rake, Katherine. 2001. Gender and New Labour's Social Policies. *Journal of Social Policy* 30, no. 2: 209-31.
- Randall, Vicky. 1996. The Politics of Childcare Policy. *Parliamentary Affairs* 49, no. 1: 176-90.
- Ranson, Gillian. 1998. Education, Work and Family Decision Making: Finding the "Right Time" to Have a Baby. *CRSA/RCSA*.
- Regierung Online. Familie, Kinder, Jugend. Chronologie der Familienpolitik.  
[http://www.bundesregierung.de/servlet/init.cms.layout.layoutervlet?global.naviknoten=12030&Link=bpa\\_notiz\\_druck&global.printview=2&link.docs=37532](http://www.bundesregierung.de/servlet/init.cms.layout.layoutervlet?global.naviknoten=12030&Link=bpa_notiz_druck&global.printview=2&link.docs=37532).
- Reid, Judith. 1976. Women in Employment. The New Legislation. *The Modern Law Review* 39, no. 4: 432-51.
- Rendall, Michael S., and Steve Smallwood. 2003. Higher Qualifications, First-Birth Timing, and Further Childbearing in England and Wales. *Population Trends* 111, no. Spring: 18-26.
- Rindfuss, Ronald R., S. Philip Morgan, and C. Gray Swicegood. 1988. *First Births in America. Changes in the Timing of Parenthood*. Berkeley, Los Angeles, London.
- Rindfuss, Ronald R., C. Gray Swicegood, and Rachel A. Rosenfeld. 1987. Disorder in the Life Course: How Common and Does it Matter? *American Sociological Review* 52, no. 6: 785-801.
- Robinson, Warren C. 1997. The Economic Theory of Fertility over Three Decades. *Population Studies* 51: 63-74.
- Robson, Paul, Shirley Dex, Frank Wilkinson, and Olga Salido Cortes. 1999. Low Pay, Labour Market Institutions, Gender and Part-Time Work: Cross-National Comparisons. *European Journal of In-*

- dustrial Relations* 5, no. 2: 187-207.
- Rønsen, Marit, and Marianne Sundström. 2002. Family Policy and After-Birth Employment Among New Mothers - A Comparison of Finland, Norway and Sweden. *European Journal of Population* 18: 121-52.
- Rost, Harald. 2002. Where Are the New Fathers? German Families With a Non-Traditional Distribution of Professional and Family Work. *Community, Work & Family* 5, no. 3: 371-76.
- Rubery, Jill, and Colette Fagan. 1995. Gender Segregation in Societal Context. *Work, Employment and Society* 9, no. 2: 213-40.
- Ryder, Norman B. 1965. The Cohort as a Concept in the Study of Social Change. *American Sociological Review* 30, no. 6: 843-61.
- Scherer, Stefani. 2001. Early Career Patterns: A Comparison of Great Britain and West Germany. *European Sociological Review* 17, no. 2: 119-44.
- Schratzenstaller, Margit. 2002. Familienpolitik - wozu und für wen? Die aktuelle familienpolitische Reformdebatte. *WSI Mitteilungen* 3.
- Schultz, T. P. 1969. "An Economic Model of Family Planning and Fertility." 77(2):153-80.
- Scott, Jacqueline. 1999. European Attitudes Towards Maternal Employment. *International Journal of Sociology and Social Policy* 19, no. 9/10/11: 151-86.
- Smallwood, Steve. 2002. "New Estimates of Trends in Births by Birth Order in England and Wales." *Population Trends* 18(Summer):32-48.
- Social Indicators Department, ZUMA Mannheim. *European System of Social Indicators (EUSI)*. [http://www.gesis.org/en/social\\_monitoring/social\\_indicators/Data/EUSI/index.htm](http://www.gesis.org/en/social_monitoring/social_indicators/Data/EUSI/index.htm).
- Spiegel Online. 2005. Steuervorteil für Gutverdiener soll entfallen. *Spiegel Online* 14.12.05.
- . 2005. Von der Leyen will auch Hausfrauen Elterngeld zahlen. *Spiegel Online* 21.12.05.
- Statistische Ämter des Bundes und der Länder. 2004. *Kindertagesbetreuung regional 2002*.
- Statistischen Bundesamt (ed.). 2004. *Datenreport 2004. Zahlen und Fakten über die Bundesrepublik Deutschland*. Bonn.
- Statistisches Bundesamt. Preise. <http://www.destatis.de/print.php>.
- . 2004. *Kindertagesbetreuung in Deutschland*.
- Stone, Pamela, and Meg Lovejoy. 2004. Fast-Track Women and the "Choice" to Stay Home. *Annals, AAPSS* 596: 62-83.
- Taniguchi, Hiromi. 1999. The Timing of Childbearing and Women's Wages. *Journal of Marriage and the Family* 61: 1008-19.
- . 2002. Determinants of Women's Entry into Self-Employment. *Social Science Quarterly* 83, no. 3: 875-93.
- The Institute for Fiscal Studies (IFS). Fiscal Facts. Child Benefit Rates. <http://www.ifs.org.uk/ff/childben.xls>.
- . Income Tax Allowances. <http://www.ifs.org.uk/ff/income.xls>.

- Twomey, Breda. 2002. Women in the Labour Market: Results from the Spring 2001 LFS. *Labour Market Trends* March: 109-27.
- Vikat, Andres. 2004. Women's Labor Force Attachment and Childbearing in Finland. *Demographic Research* Special Collection 3: 175-212.
- Waldfogel, Jane. 1997. The Effect of Children on Women's Wages. *American Sociological Review* 62, no. 2: 209-17.
- Walke, Rainer and Michaela Kreyenfeld. 2006. *Spellsort*.
- Ward, Clare, Angela Dale, and Heather Joshi. 1996. Combining Employment with Childcare: An Escape from Dependence? *Journal of Social Policy* 25, no. 2: 223-47.
- Woodland, Stephen, Melisa Miller, and Sarah Tipping. 2004. Repeat Study of Parent's Demand for Childcare. *National Centre for Social Research. Department for Education and Skills. Research Report No. 348*.