

Klemm, Marcus

Working Paper

Job Security and Fertility: Evidence from German Reunification

Ruhr Economic Papers, No. 379

Provided in Cooperation with:

RWI – Leibniz-Institut für Wirtschaftsforschung, Essen

Suggested Citation: Klemm, Marcus (2012) : Job Security and Fertility: Evidence from German Reunification, Ruhr Economic Papers, No. 379, ISBN 978-3-86788-434-1, Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI), Essen, <https://doi.org/10.4419/86788434>

This Version is available at:

<https://hdl.handle.net/10419/67138>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



RUHR

ECONOMIC PAPERS

Marcus Klemm

Job Security and Fertility: Evidence from German Reunification



RUHR
UNIVERSITÄT
BOCHUM

RUB

#379

Imprint

Ruhr Economic Papers

Published by

Ruhr-Universität Bochum (RUB), Department of Economics
Universitätsstr. 150, 44801 Bochum, Germany

Technische Universität Dortmund, Department of Economic and Social Sciences
Vogelpothsweg 87, 44227 Dortmund, Germany

Universität Duisburg-Essen, Department of Economics
Universitätsstr. 12, 45117 Essen, Germany

Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI)
Hohenzollernstr. 1-3, 45128 Essen, Germany

Editors

Prof. Dr. Thomas K. Bauer
RUB, Department of Economics, Empirical Economics
Phone: +49 (0) 234/3 22 83 41, e-mail: thomas.bauer@rub.de

Prof. Dr. Wolfgang Leininger
Technische Universität Dortmund, Department of Economic and Social Sciences
Economics – Microeconomics
Phone: +49 (0) 231/7 55-3297, email: W.Leininger@wiso.uni-dortmund.de

Prof. Dr. Volker Clausen
University of Duisburg-Essen, Department of Economics
International Economics
Phone: +49 (0) 201/1 83-3655, e-mail: vclausen@vwl.uni-due.de

Prof. Dr. Christoph M. Schmidt
RWI, Phone: +49 (0) 201/81 49-227, e-mail: christoph.schmidt@rwi-essen.de

Editorial Office

Joachim Schmidt
RWI, Phone: +49 (0) 201/81 49-292, e-mail: joachim.schmidt@rwi-essen.de

Ruhr Economic Papers #379

Responsible Editor: Christoph M. Schmidt

All rights reserved. Bochum, Dortmund, Duisburg, Essen, Germany, 2012

ISSN 1864-4872 (online) – ISBN 978-3-86788-434-1

The working papers published in the Series constitute work in progress circulated to stimulate discussion and critical comments. Views expressed represent exclusively the authors' own opinions and do not necessarily reflect those of the editors.

Ruhr Economic Papers #379

Marcus Klemm

**Job Security and Fertility:
Evidence from German Reunification**



RUHR
UNIVERSITÄT
BOCHUM

RUB

Bibliografische Informationen der Deutschen Nationalbibliothek

Die Deutsche Bibliothek verzeichnet diese Publikation in der deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über:

<http://dnb.d-nb.de> abrufbar.

<http://dx.doi.org/10.4419/86788434>

ISSN 1864-4872 (online)

ISBN 978-3-86788-434-1

Marcus Klemm¹

Job Security and Fertility: Evidence from German Reunification

Abstract

This paper uses the special occupational status of German civil servants in combination with the unforeseen event of German reunification to study empirically the relationship between job security and fertility. The civil servant-status provides extreme job security as well as good possibilities to combine work and family lives. The fast introduction of the civil service system after reunification represents an exogenous (re-)assignment of individual employment risks in Eastern Germany, and thus allows one to control for occupational self-selection. While no strong evidence for a link between job security and fertility emerges for men, the paper demonstrates a clear link between labor market and demographic outcomes for women, especially in Western Germany and most pronounced for higher educated females between age 25 and 40. This strong relationship is the result of occupational self-selection coupled with a civil servant-specific birth timing pattern and a small causal impact of job security on fertility. It shows that female civil servants are not primarily a selected group of very family oriented individuals, but rather both family as well as career oriented.

JEL Classification: D12, J13, J24

Keywords: Job security; fertility; occupational choice

October 2012

¹ German Council of Economic Experts, Ruhr Graduate School in Economics and Ruhr-Universität Bochum. – This paper solely reflects the personal views of the author and not necessarily those of the German Council of Economic Experts. The paper is not an official publication of the German Council of Economic Experts and does not necessarily reflect the views of its members. I thank John P. Haisken-DeNew, Jan Kleibrink, Christoph M. Schmidt and seminar participants at the RWI Essen for helpful comments and suggestions. Financial support by the RGS Econ is gratefully acknowledged. In addition, I thank the Ruhr-University Research School funded by Germany's Excellence Initiative for further support [DFG GSC 98/1]. – All correspondence to Marcus Klemm, German Council of Economic Experts, c/o German Federal Statistical Office, Gustav-Stresemann-Ring 11, 65189 Wiesbaden, Germany, E-Mail: marcus.klemm@destatis.de.

1 Introduction

Labor market outcomes, demographic developments and their interrelations are of major social and economic importance. Since the 1970's, Germany – like many other developed countries – has been experiencing low total fertility rates that lie significantly below the population replacement rate while female employment rates have been steadily increasing (Adsera 2005). Therefore, the (in)compatibility of work and family lives, especially for women, has become an area of major public concern, leading to several family policy changes since the 1990's and a large reform of the parental leave and benefit system in 2007.¹

Since the seminal contribution of Becker (1960), economists have been investigating fertility decisions, and in particular the importance of labor market outcomes for fertility. The other way around, the effects of having children on parents' economic decisions, including labor supply, have been subject to many studies, too (see Browning 1992, for a survey). Since career and family choices are closely interrelated, it is difficult to address each of them in isolation assuming either fertility or labor market outcomes as exogenous. Relatively few studies have addressed family, labor supply as well as educational or occupational choices jointly (Hotz and Miller 1988, Francesconi 2002, Sheran 2007, Adda *et al.* 2011). Besides the obvious opportunity costs of having children in the form of foregone labor earnings and loss of labor market experience, economic uncertainty represents a possible determinant of fertility in its own right (Ranjan 1999, Kreyenfeld 2010, Bhaumik and Nugent 2010). In particular, economic uncertainty is widely believed to have contributed to the large drop of birth rates in Eastern Germany after reunification (Witte and Wagner 1995, Conrad *et al.* 1996, Adler 1997, Lechner 2001, Kreyenfeld 2003, Huinink and Kreyenfeld 2005, Bhaumik and Nugent 2010).

This paper contributes to the economic literature on the relationship between labor market outcomes and fertility decisions in three ways. First, it focuses on job security as a possible causal determinant of fertility by exploiting the exogenous institutional changes brought about by German reunification in Eastern Germany. Second, these changes allow me to account for occupational self-selection which is very likely important when studying career and family choices. Third, I include women as well as men in the analysis. While most studies to date focus on women who face the more costly trade-off between having children or a professional career, job security is likely important for men too, especially if the male-breadwinner model applies as often argued for Western Germany (Tölke and Diewald 2003, Kreyenfeld 2004, and references therein).

The empirical analysis is based on the idea of Fuchs-Schündeln and Schündeln (2005): The special occupational status of German civil servants is combined with the “natural experiment” of German reunification to study the relationship between job security and fertility. The civil servant-status provides a very high level of job security as well as good possibilities to combine work and family life. The analysis is based on the identification assumption that the fast introduction of the Western German civil service system after reunification constitutes an exogenous (re-)assignment of individual employment risks in Eastern Germany where occupational choice was largely independent of risk or family preferences and of the special rights granted by the – then nonexistent – civil servant-status before 1990. The empirical analysis studies future concep-

¹A first evaluation of this reform is provided by Kluge and Tamm (2009).

tions to avoid reverse causality and is based on large scale individual-level data from the German Socio-Economic Panel.

While no strong evidence for a link between job security and fertility emerges for men, the analysis demonstrates a clear link between the civil servant status and having children for women, especially in Western Germany. The empirical effects are particularly pronounced for better educated females between age 25 and 40 for whom the probability of a conception is almost 4%-points (or 66%) higher when being a civil servant, conditional on being employed and individual socio-economic and occupational characteristics. The comparison of the regression results from different Western and Eastern German samples suggest that occupational selection and a particular birth timing accounts for much of this effect, and that job security also contributes directly to fertility albeit to a smaller degree. When subjective family and career attitudes are accounted for, it shows that female civil servants are not a selected group of very family oriented individuals, but rather both family as well as career oriented, which has important consequences for employers who want to attract more females, and public discussions about the importance of the compatibility of work and family lives.

The remainder of the paper is organized as follows. The next section briefly discusses the theoretical background and reviews the empirical evidence about the relationship between job security and fertility. Section 3 describes the institutional background of the German civil service system and its introduction in Eastern Germany after reunification. Section 4 presents the data and introduces the empirical strategy. The estimation results are presented in section 5. The last section concludes.

2 Economic background

Job security is one of the most important employment characteristics. Its relationship with other socio-economic outcomes has frequently been investigated. Prominent research areas include the importance of job insecurity for consumption and saving (e.g., Benito 2006, Carroll *et al.* 2003), health (e.g., Burgard *et al.* 2009, Reichert and Tauchmann 2011) or subjective well-being (e.g., Knabe and Rätzl 2010, Green 2011). The relationship between job insecurity and fertility constitutes another important field for economic research, especially because labor market outcomes and fertility mutually affect each other (Browning 1992, Adda *et al.* 2011).

2.1 Theoretical considerations

Since Becker (1960), economic research has been dealing with the analysis of fertility. The basic idea underlying economic models of fertility is that children yield utility to their parents and can hence be regarded as (durable) consumption goods.² If parents derive utility from consumption as well as from children, they will face a classical trade-off problem between two competing life

²They can also be regarded as investments goods in that they can provide income to their parents later in life, or as an insurance mechanism. As argued by Bhaumik and Nugent (2010), the insurance aspect of having children should not be important in Germany because of its advanced social security and welfare system.

domains, having a career or a family.³ However, the existence or type of this trade-off depends on the institutional surroundings, and thus remains to some extent an empirical question (Michaud and Tatsiramos 2011, Adsera 2011). Kreyenfeld (2004) studies fertility decisions in West and East Germany before reunification. In the West, work and family were rather incompatible life-domains for women, whereas both could be combined more easily in the East.

Based on Zedeck (1992), Tölke and Diewald (2003) discuss the three possibilities for the relationship between labor market success and family formation for men: First, labor market success and family formation can be positively linked (“spillover hypothesis”). Second, both life domains can be negatively linked (“compensation hypothesis”). Third, they can represent mutually independent life domains that do not influence each other (“segmentation hypothesis”). The authors find strong empirical support for the first hypothesis. In a traditional male breadwinner society, sound economic prospects can be regarded as a prerequisite for having children. With increasing female labor market participation, this could also be hypothesized for women. But the link between economic uncertainty and fertility likely depends more heavily on a woman’s values, life goals and abilities (Kreyenfeld 2010).

It has long been realized that work and family choices are very closely interwoven and should be analyzed jointly, especially for women. An early example of for such an empirical study is Hotz and Miller (1988) who estimate a life cycle model where labor supply decisions link wages and fertility. Francesconi (2002) incorporates the choice between full-time and part-time employment into a dynamic model of married women’s labor supply and fertility. But the intertemporal optimization problem does not only apply to labor supply and fertility decisions, it also includes educational, occupational and marriage choices. Sheran (2007) develops and estimates a dynamic model where labor supply, education, marriage and fertility are determined endogenously. Her results suggest that all of these life domains are indeed closely related, and that choices also vary with personal characteristics. In a theoretical model, Watts (2008) shows that women may abstain from having a more prestigious career or a family because of the uncertainty surrounding the possibility of having both. Ma (2010) and Adda *et al.* (2011) both explicitly model occupational choices in life cycle models of female labor supply and fertility. While Ma (2010) focuses on occupational choices over the life cycle, Adda *et al.* (2011) highlight the importance of fertility plans even for career decisions made very early in life. They attribute 20% of the fertility-related wage costs incurred by women to occupational choices made at the start of their careers.⁴

What stands out for the reduced-form estimation carried out in the study at hand is that the measure of job security must be exogenous in an econometric sense to fertility. Otherwise, the estimates could suffer from an omitted variable bias because work and family choices have been jointly determined at an (unobserved) earlier stage. Since educational and the first occupational choices are in most cases made before children arrive, the most critical point to address is the potential selection of family oriented individuals into family friendly jobs, e.g., jobs that provide

³This is obviously a very simplified picture that only serves to illustrate the main idea. For instance, Becker (1960) explicitly incorporates the quantity and quality of children into his analysis. Apart from the economic approach for explaining fertility, other theories exist which put more emphasis on the role of personal values, attitudes or general life plans (see Bernardi *et al.* 2007, Kreyenfeld 2010).

⁴In total, Adda *et al.* (2011) estimate women’s total costs of fertility at 64% of life-time earnings. 75% of these costs are due to reduced labor supply, and 25% due to lower wages.

a high level of security or flexibility. Polachek (1981) already showed that women's realized occupational choices and career interruptions are related, and that this relationship potentially explains much of the different occupational distributions among women and men. Blakemore and Low (1984) draw the same conclusion for the choice of college majors: Women who expect higher levels of fertility choose occupations in which human capital depreciates at lower rates during career interruptions. Most of the economic literature on occupational choices is based on the neoclassical human capital approach and focuses on the pecuniary aspect of the different choices, but there are more job and institutional characteristics that can be expected to be important when looking at the interplay of work and family lives. For instance, institutional settings and reforms have been shown to affect fertility patterns (Adsera 2005, Michaud and Tatsiramos 2011, Lalive and Zweimüller 2009). Humlum *et al.* (2012) include non-pecuniary aspects in their analysis and find that the different educational choices of women and men can be explained by personal identity factors, in particular career and social orientation.

2.2 Empirical evidence

Establishing a causal link from fertility to employment in empirical studies is difficult and can critically depend on econometric modeling assumptions, especially concerning the exogeneity of fertility (Cramer 1980, Michaud and Tatsiramos 2011). Rosenzweig and Wolpin (1980) use the event of twins at first birth as an exogenous variation in fertility and find large effects of children on female labor supply in the short, but not in the long run. The econometric problem of establishing causality is not much different concerning the other direction – from labor market characteristics to fertility. With data for Western Germany, Schröder and Brüderl (2008) show that female employment is negatively correlated with future fertility, but based on two indirect causality tests the authors argue that this relationship is rather due to occupational self-selection than a direct effect.

Job security has been identified as one potentially important aspect for fertility. Theoretically, delaying childbearing can be optimal when income uncertainty is high because having children impacts irreversibly on future career possibilities (Ranjan 1999, Bhaumik and Nugent 2010). Sobotka *et al.* (2011) review the literature on the impact of recessions on fertility and discuss uncertainty as one mechanism through which fertility is affected by economic downturns. Hondroyannis (2009) shows with macroeconomic panel data for 27 European countries that output volatility as well as unemployment rates are negatively related to fertility, and argues that labor market insecurity might be an important factor that negatively impacts on the decision to have children. Adsera (2011) shows with microeconomic data for women from 13 European countries that high levels of unemployment are associated with postponed fertility, even when controlling for individual work histories. A negative impact of unemployment on the transition to first births is also found by Meron and Widmer (2002) for young French women at the start of their professional careers. Kreyenfeld (2010) does not find evidence that employment uncertainty generally leads German women to postpone fertility. She finds that unemployment as well as economic concerns delay fertility among the high educated, but accelerate family formation among the low educated. A similar relationship between economic uncertainty, fertility and education is found by Huinink and Kreyenfeld (2005) for Eastern German women born in 1971 who entered

adulthood when the Berlin Wall came down in 1989. Del Bono *et al.* (2011, 2012) and Huttunen and Kellokumpu (2012) find that exogenous job displacements, but not unemployment reduce fertility among Austrian women. This negative effect is driven by women in high skilled jobs who are probably more career oriented. For Germany, Bhaumik and Nugent (2010) report a non-linear relationship between job security and fertility, i.e., women who feel either very secure or very insecure about their employment situation have a higher probability of giving birth than those who are in between, which might have contributed to the exceptionally low fertility rates in Eastern Germany following reunification. For Western German men, Tölke and Diewald (2003) find that job insecurity lowers the probability to become a father in the near future.

3 Institutional background

The following empirical analysis is based on the approach of Fuchs-Schündeln and Schündeln (2005) which has two main features. First, it is argued that civil servants in Germany face virtually no employment uncertainty and can combine work and family life more easily than other occupational groups. Second, while family oriented individuals can be expected to self-select into this special occupational status in Western Germany, this selection process should be much less pronounced in Eastern Germany, if existent at all.

3.1 The occupational status of civil servants

Public sector employment is often associated with advantages in terms of earnings or job security compared to other employees (see, e.g., Fuchs-Schündeln and Schündeln 2005, Lüchinger *et al.* 2010b, Adsera 2011, Danzer 2011). In Germany, the special status of civil servants offers an additional layer of job and income security even within the public sector. Civil servants report higher job satisfaction, lower job insecurity and less unemployment experience than public employees who, in turn, report to be better off than private employees (Lüchinger *et al.* 2010b, Table 1). The civil servant status is regulated by German federal and state laws (e.g., the federal civil servant law “*Bundesbeamtengesetz (BBG)*” and the federal remuneration law “*Bundesbesoldungsgesetz (BBesG)*”). Fuchs-Schündeln and Schündeln (2005) and Giavazzi and McMahon (2010) discuss the high level of employment and income security of civil servants in detail: They are granted life tenure and can only be dismissed in exceptional cases. Their salaries cannot decline, and the future income paths are highly predictable with very low fluctuations.

As argued by Fuchs-Schündeln and Schündeln (2005), subjective and objective employment and income uncertainty are very likely to coincide if they are determined by the legal status as in the case of civil servants. Their relative employment security compared to other employees is larger in the Eastern than in the Western part of Germany because the overall economic situation is worse in Eastern Germany. The unemployment rate in the Eastern German states sharply increased after German reunification, reaching a maximum of 20.6% in 2005. On average, the unemployment rate between 1991 and 2010 was 17.0%, about twice as high as the Western average of 8.7% (maximum 11.0% in 2005) (Federal Employment Agency 2011).⁵ However,

⁵Bonin and Zimmermann (2000) describe the labor market situation in East Germany in the 1990's in detail.

Eastern German civil servants might not perceive their occupational situation as safe if the major upheaval of German reunification eroded their trust in public institutions. From self-reported information in the German-Socio Economic Panel (GSOEP)⁶ about perceived job security, it can be concluded that while Eastern Germans generally feel more insecure about their employment situation, the relative advantage of civil servants is even larger in the East: On a scale from 0% to 100%, Eastern German civil servants rate the probability of losing their job within the next two years at only 9%. Other Eastern German employees report a probability of approximately 30%. In Western Germany, the respective probabilities are only 5% and 20%.⁷

In addition to the great economic security, the civil servant status is also more compatible with having a family than other occupations. The income of civil servants is partly based on the family situation (marital status and number of children, see BBesG). Civil servants have a right to work part-time or take up to 15 years of unpaid leave for family reasons (e.g., care of children or other family members, see BBG), and the return to work must be supported by the employer. Similarly generous rights do not exist for other employees.

The German family policy measures do not differentiate between civil servants and other employees. While monetary child and child-rearing benefits have been changed several times since 1990 with the latest major reform in 2007 (federal parental benefit and leave law “*Bundeseltern-geld-und Elternzeitgesetz (BEEG)*”), they do not constitute any major differential between civil servants or other occupational groups with regard to the incentives for having children.⁸ The extensions of parental leave periods from 15 to 18 months in 1990 and to 3 years in 1992, and an extension of child sick leave in 1992 should have relatively decreased the disadvantage for other occupational groups (for a timeline of family policies until 2002, see Kreyenfeld 2004, Table 2). But since job guarantees after a parental leave and the entitlements to part-time arrangements depend on employment and employer characteristics (e.g., temporary contracts or company size, see BEEG), civil servants are still in a much more comfortable employment situation than most other employees.

Civil servants are not part of the public statutory health insurance and pension scheme which is a major difference between them and other parts of the population. Again, civil servants can be regarded as relatively better covered by their special health and pension systems. There are also some drawbacks of being a civil servant: Career flexibility and opportunities are limited, and salaries are capped depending on age, region, education and family situation. Still, civil servants can be found across almost all age groups, educational levels, as well as many income groups, sectors and company sizes. Giavazzi and McMahon (2010) estimate propensity scores for a household in their GSOEP sample being headed by a civil servant, and find that the probability of being a civil servant household is similar for civil servant and non-civil servant households. Therefore, civil servants can confidently be regarded as sufficiently similar to other employees while possessing some distinctive employment features that warrants their use as the “treatment

⁶The dataset is described in detail in Section 4.1.

⁷These differences are all highly statistically significantly different from 0 and from each other. The same pattern is found for information on worries about the employment or economic situation, or the likelihood of really becoming unemployed.

⁸Tamm (2010) and Kluge and Tamm (2009) show that such reforms have an impact on the labor market participation of parents, but do not differentiate between civil servants and other employees.

group” in the empirical analysis.⁹

3.2 The introduction of civil service in Eastern Germany

The advantages of being a civil servant are well known in Germany and their justifications are also frequently subject to public discussions. Therefore, certain individuals can be expected to self-select into this occupational status. Fuchs-Schündeln and Schündeln (2005) and Pfeifer (2011) show that this is true for risk averse individuals. More generally, Lüchinger *et al.* (2010a) show that self-selection into the private or public sector is important when studying the determinants of job satisfaction. Occupational self-selection can also take place due to the family orientation of individuals. While such a selection process could have always been present in Western Germany, this is different for Eastern Germany. The unexpected event of German reunification marked by the fall of the Berlin Wall in November 1989 can be seen as a natural experiment (Frijters *et al.* 2004, Alesina and Fuchs-Schündeln 2007, Redding and Sturm 2008, Bauernschuster and Rainer 2011). Here, the most important aspect of the reunification process is the largely exogenous assignment of the civil servant status to individuals from the former German Democratic Republic (GDR).

As discussed by Fuchs-Schündeln and Schündeln (2005), occupational choice was strongly limited in the GDR, unemployment virtually did not exist and income inequality was very low. From the early 1970’s onward, a pro-natalist family policy created a high degree of compatibility between labor market participation and having children, e.g., by providing extensive public day care for all families (Kreyenfeld 2004). Bauernschuster and Rainer (2011) investigate differences in sex-role attitudes between East and West Germans. They and Kreyenfeld (2004) discuss the institutional settings concerning work and family lives before, during and after the separation of Germany. From these descriptions, it can be confidently concluded that occupational choice in the GDR was largely independent of risk and family preferences (see also Bredtmann *et al.* 2009).

Article 20 of the German Reunification Treaty of 1990 called for the introduction of the civil service system in Eastern Germany “as soon as possible”. Quint (1997) and Schwanengel (1999) describe the process which took place in two major steps: First, entire units of the public administration and companies were reviewed and closed if not needed. Second, individual public employees could be dismissed if their service was not needed any longer. Those who stayed served a qualifying period of 1 to 4 years and a probationary period of 2 to 3 years (depending on education and position). Afterward, they underwent individual reviews. Employees could be dismissed on grounds of violations of the principles of humanity or a too close affiliation with the former GDR regime.¹⁰ If granted the civil servant status for life, Eastern Germans possess the same rights as their Western German counterparts, including all privileges.

⁹Since Giavazzi and McMahon (2010) refer to civil servant households and not individuals, it is also very unlikely that the regression results suffer from an omitted variable bias due to different household structures of civil servants and other population groups, in particular because the major household and family characteristics are included in the regressions.

¹⁰Quint (1997) notes that one of the major difficulties for the introduction of the civil service system was to strike a balance between sweeping away the old GDR system and providing enough continuity for the Eastern German population.

According to Schwanengel (1999), the earliest possible date for granting an Eastern German employee the civil servant status (on probation) was April 3, 1991 because at least 6 months of the qualification period had to be served under Western German law. According to Keller and Henneberger (1992), all Eastern German civil servants were on probation until December 31, 1996. The official number of civil servants in Eastern Germany increased sharply from 5,000 in 1991 to 171,000 in 1997. The maximum of 188,000 civil servants was reached in 2000 and 2001. Then, the number declined slightly to reach 171,000 in 2010. On, average, civil servants represent close to 5% of the working population in Eastern Germany since 1997 (Federal Statistical Office 2011c).¹¹

Keller and Henneberger (1992), Karpen and Maass (1992) and Schwanengel (1999) all note that the actual implementation of the civil service system in Eastern Germany was difficult and heterogeneous across federal states and occupations. The system was introduced much faster on the federal level than on the state or community levels.¹² At the beginning, mainly police women and men, firefighters and employees of the financial and social security administration became civil servants (Karpen and Maass 1992). In contrast to Western Germany, many teachers did not become civil servants, e.g., in Saxony or Brandenburg (Karpen and Maass 1992, Schwanengel 1999). In 2010, 71% of all Eastern German civil servants worked in the public administration (including police, judiciary system and armed forces) and 20% in the education sector. This compares to 48% and 41%, respectively, in Western Germany (Federal Statistical Office 2011b).¹³ In addition, Karpen and Maass (1992) report that no former GDR citizens older than 50 should have entered the civil service system when it was introduced in Eastern Germany. In sum, the groups of civil servants in the two parts of Germany are composed quite differently. And occupational self-selection should be much less pronounced in Eastern Germany because the decision to grant the civil servant status was mainly based on objective demand side-determined criteria.¹⁴

4 Data and empirical strategy

The empirical analysis of the relationship between fertility and labor market outcomes has strong data demands. Ideally, complete individual biographies, including fertility and employment histories would be covered. Here, the task is even more demanding because enough observations of female and male civil servants in Western and Eastern Germany are needed. Adda *et al.* (2011)

¹¹For comparison, the number of civil servants has been declining steadily from 1.8 million in 1991 to 1.5 million in 2010 in Western Germany, representing about 6% of the working population. The overall number of civil servants was reduced by approximately 300,000 in 1995 due to the privatization of Deutsche Post.

¹²The federal civil service law was introduced very shortly after reunification. In June 1994, Thuringia was the last state to pass its own state law.

¹³In both Eastern and Western Germany, about 75% of civil servants are employed by the state governments. In the East (West), 12% (7%) are employed by the German government, 8% (11%) by local governments and the remaining part by other (semi-)public institutions (including Deutsche Bahn and Deutsche Telekom).

¹⁴Nevertheless, it is possible that individuals who were eligible to become civil servants, might have chosen to self-select out of the civil service system. Some selection based on personality (including risk preferences) and family situation might have happened within the individual reviews, too. And self-selection might have taken place to a small degree on the community level (Karpen and Maass 1992). But it seems very unlikely that such a selection were of a similar magnitude to that in the West. If at all, it should be into the same direction in Eastern and Western Germany.

combine administrative data from the German social security records with survey data from the German Socio-Economic Panel (GSOEP). Since civil servants are not part of the statutory social security system, such administrative data are not available. However, the GSOEP alone offers high-quality data that can be exploited to study fertility decisions (e.g. Bhaumik and Nugent 2010, Brose 2008, Kreyenfeld 2010, Hener 2010) as well as the behavior of civil servants (Fuchs-Schündeln and Schündeln 2005, Giavazzi and McMahon 2010).

4.1 Data and sample

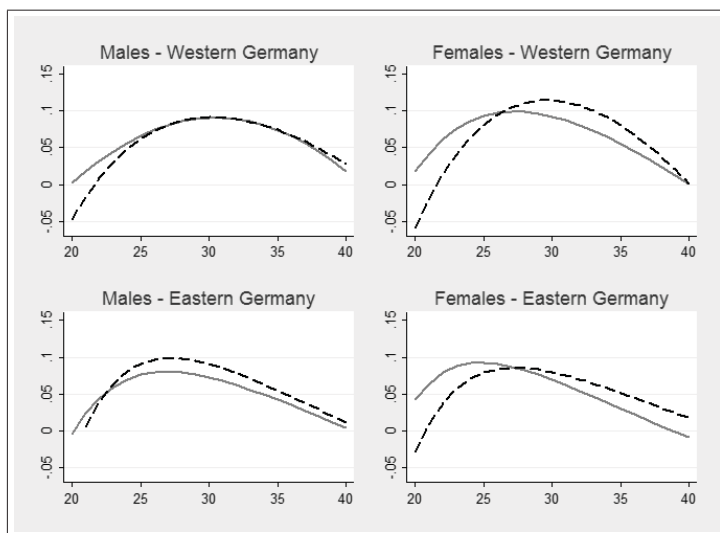
The GSOEP is an annual household panel study which started in 1984 with approximately 12,000 individuals living in 6,000 households. Since then, the survey population has been augmented through refreshment samples (1998, 2000, 2006, 2009) and samples of particular population groups (East Germans, immigrants, high-income households). In 2010, more than 20,000 individuals in more than 10,000 households were interviewed (see Wagner *et al.* 2007, Haisken-DeNew and Frick 2005, for an overview and a detailed description of the GSOEP, respectively).¹⁵ The empirical analysis covers the years 1992 to 2008 because information about individuals from Western and Eastern Germany is needed. Since the introduction of the civil service system in Eastern Germany took some time (see Section 3), the analysis starts in 1992. This also ensures that the immediate turmoil following German reunification which was accompanied by a large drop in Eastern German birth rates (Lechner 2001, Kreyenfeld 2003) does not impact on the analysis. The analysis stops in 2008 because it looks at child conceptions which require information two years into the future (see below).

The empirical analysis focuses on employed individuals in the relevant age bracket from 18 to 45. In order to make the full sample population broadly comparable to civil servants, the following groups are excluded: Immigrants and non-German individuals (mainly GSOEP subsamples B and D), individuals without an educational degree, individuals in households with either a very low or very high income (less than EUR 400, more than EUR 10,000) or with either a very low or very high personal income (less than EUR 150, or more than EUR 10,000).¹⁶ The analysis is also restricted to individuals who are either the head or the spouse of the head of a household. In total, the baseline analysis covers 62,943 person-year observations (11,032 individuals observed for 5.7 years, on average): 21,799 Western German males (including 2,210 civil servants) and 19,198 Western German females (including 1,449 civil servants) as well as 10,828 Eastern German males (including 483 civil servants) and 11,118 Eastern German females (including 319 civil servants). Western and Eastern Germany always refer to the place of living in 1989, just before reunification. Since civil servants differ from the rest of the population with regard to central socio-economic characteristics (see Table 1), the investigations are also carried out for a more restricted sample of individuals from age 25 to 40, with medium or high education, which leaves 30,052 observations.

¹⁵The data used in this paper were extracted using the Add-On package PanelWhiz v3.0 (Nov 2010) for Stata. PanelWhiz was written by Prof. Dr. John P. Haisken-DeNew (john@panelwhiz.eu). The PanelWhiz generated do-file to retrieve the GSOEP data used here and any PanelWhiz plugins are available upon request. Any data or computational errors are my own. Haisken-DeNew and Hahn (2010) describe PanelWhiz in detail.

¹⁶The income values are based on the bottom- and top-1% of the respective income distributions, but less restrictive.

FIGURE 1: Age pattern of conceptions



Notes: Fractional polynomial fit plots of conceptions vs. age for all individuals (solid gray lines) and those who have ever been a civil servant (dashed black lines) from age 20 to 40. Data from 1992 to 2008, weighted using cross-sectional weights of the GSOEP. Source: GSOEP, own calculations

The dependent variable Y_{it} in the regression analysis is the conception of a child. The GSOEP offers precise biographical information on the birth month and year of the respondents' children. In addition, respondents report annually if and when a child was born within the two years preceding the interview. This information is particularly helpful for male respondents for whom birth histories are not consistently available before 2001.¹⁷ The birth dates are backdated by 10 months, and compared to the interview dates of the GSOEP participants. In order to avoid any reverse causation from conceptions or births on the employment situation, the dummy variable for conceptions takes the value 1 at the time of the last interview before a conception, and 0 otherwise (see also Kreyenfeld 2010).¹⁸ Figure 1 and Table 1 show that the conception data follow the typical hump shape over the most relevant range from age 20 to 40, and are well in-line with official birth statistics for Germany (cf. Federal Statistical Office 2011a). In the full sample, 43 conceptions per 1,000 women between age 18 and 45 are observed, with a maximum of approximately 100 births per 1,000 women in their late twenties. Birth rates are also lower in Eastern than in Western Germany.

The central explanatory variable for the analysis is an indicator variable reflecting if an individual is a civil servant or not, which serves as a measure of extreme job security (Fuchs-Schündeln and Schündeln 2005, Giavazzi and McMahon 2010). The information about the civil servant

¹⁷For remaining individuals with missing information, I also identify births from changes in the number of children in the household of adult individuals who are either the head of the household or her spouse and did not change households during the corresponding time frame. This procedure excludes multi-generational households and covers only few cases. It does not impact on the estimation results.

¹⁸If only the year of a birth is known, the birth month is set to June. In case of earlier actual births, the respondents could already be pregnant at the time of the corresponding interview. Due to the 10 months time lag however, the pregnancy would still be at an early stage and any influence on the employment situation strongly limited because maternity protection leave only starts 6 weeks before the scheduled birth date.

TABLE 1: Selected descriptive statistics
for the pooled sample of the employed

	West in 1989		East in 1989	
	Others	Civil servants	Others	Civil servants
<i>Employed males, 18 – 45 years old</i>				
Conception of child	0.046 (0.210)	0.047 (0.212)	0.034 (0.181)	0.030 (0.170)
Child born	0.058 (0.234)	0.053 (0.224)	0.041 (0.199)	0.044 (0.206)
Any children	0.56 (0.50)	0.58 (0.49)	0.64 (0.48)	0.64 (0.48)
Number of children	1.00 (1.07)	1.03 (1.06)	1.05 (0.96)	0.92 (0.81)
Age	36.49 (5.67)	37.62 (5.38)	35.48 (6.13)	34.48 (6.21)
Married	0.62 (0.48)	0.72 (0.45)	0.61 (0.49)	0.58 (0.49)
Household income	2807.05 (1159.44)	3211.44 (1008.63)	2381.90 (954.37)	2708.29 (895.64)
Years of education	12.70 (2.57)	13.70 (2.92)	12.53 (2.21)	13.21 (2.48)
Observations	19,589	2,210	10,345	483
<i>Employed females, 18 – 45 years old</i>				
Conception of child	0.040 (0.196)	0.059 (0.235)	0.031 (0.174)	0.051 (0.219)
Child born	0.012 (0.111)	0.019 (0.138)	0.005 (0.074)	0.003 (0.052)
Any children	0.55 (0.50)	0.51 (0.50)	0.74 (0.44)	0.54 (0.50)
Number of children	0.98 (1.06)	0.86 (1.01)	1.22 (0.94)	0.80 (0.86)
Age	35.43 (6.37)	35.83 (6.33)	34.75 (6.66)	31.53 (6.42)
Married	0.54 (0.50)	0.52 (0.50)	0.59 (0.49)	0.52 (0.50)
Household income	2758.29 (1282.40)	3438.03 (1458.50)	2455.03 (1022.78)	3008.39 (1118.56)
Years of education	12.47 (2.27)	15.06 (2.75)	12.75 (2.09)	14.40 (2.67)
Observations	17,749	1,449	10,799	319

Notes: Table reports variable means for the pooled samples from 1992 to 2008, standard deviations in parentheses. Statistics weighted to be nationally representative by using cross-sectional weights of the GSOEP. Unweighted statistics for all variables included in the regression analysis reported in the Appendix.

Source: GSOEP, own calculations

status is taken directly from the survey respondents' answers. The share of civil servants also coincides with the official statistics (Federal Statistical Office 2011b). In the Western sample, about 10% of the male and 8% of the female respondents are civil servants. In the Eastern sample, these are only 4.5% of the men and 3% of the women. While the share of civil servants declined for men and remained stable for women in Western Germany from 1992 to 2008, these shares increased strongly to approximately 5% for both men and women in Eastern Germany.¹⁹

The other covariates included in the model comprise personal, household and occupational characteristics. The specification essentially follows previous work by, e.g., Kreyenfeld (2010), Huttunen and Kellokumpu (2012), Bhaumik and Nugent (2010), Del Bono *et al.* (2011) or Adsera (2011). The inclusion of these control variables is also necessary to control for the apparent

¹⁹The shares reported here are slightly higher than the official statistics because the sample excludes all non-Germans and individuals without an educational degree or with very low or high incomes.

observable socio-economic differences between civil servants and other individuals. The personal and household characteristics included are age and its square, educational attainment (low, medium or high)²⁰, indicators for having a steady partner and being married, household net and personal gross labor income in logs, health satisfaction on a scale from 0 to 10, indicators for being religious²¹, for having 1, 2 or 3 or more children, and for owning a home. In order to allow for different age profiles, the education dummies are interacted with age and age squared in all regressions. The occupational characteristics comprise the tenure at the current employer, dummy variables for being a blue-collar worker or an entrepreneur, working part-time, the company size and different industry sectors, in particular the public and education sectors where most civil servants are employed.²² Furthermore, state unemployment rates at the month of the interview, a dummy for currently living in Eastern Germany and year dummies are included in the regressions.

Table 1 provides selected weighted nationally-representative descriptive statistics for male and female civil servants and other working individuals from Western and Eastern Germany (complete unweighted statistics for all variable are provided in the Appendix, Tables A and B). There are clear, but not too sizable differences between civil servants and the rest of the working population, especially with regard to education and income. Civil servants are on average higher educated and better off financially. There are also relative differences when comparing Western and Eastern Germans. For instance, while civil servants are slightly older in the Western sample, they are younger in the Eastern sample. Among the Eastern Germans, they also have fewer children whereas there is no clear difference in the Western sample. Particularly for women, the difference between observed conceptions and births reflects that many women do not return to employment immediately after having a child.

4.2 Econometric specification

Empirical estimates of the relationship between fertility and (female) labor supply can critically depend on econometric modeling assumptions, in particular concerning the exogeneity of fertility (Cramer 1980, Browning 1992, Nakamura and Nakamura 1992, Michaud and Tatsiramos 2011). The theoretical considerations presented in Section 2 highlight the mutual interplay of work and family choices, especially for women. Estimates of the effects of labor market outcomes, including unemployment, wages or job security, on fertility are subject to similar modeling issues. Here, the most important assumption relates to the exogeneity of job security.

To date, job security has been operationalized in empirical studies of fertility by including unemployment rates (Adsera 2005, Hondroyiannis 2009, Adsera 2011), individual unemployment (Meron and Widmer 2002, Schmitt 2012, Kreyenfeld 2010, Adsera 2011) or subjective perceptions (Bhaumik and Nugent 2010, Tölke and Diewald 2003, Kreyenfeld 2010) as an explanatory

²⁰The educational classification is based on ISCED and years of education completed. Individuals without an educational degree (less than 10 years) are excluded from the analysis. The low educated have 10 to 11 years of education (basic school degree), the medium educated 12 to 14 (vocational degree), and the high educated 15 or more years (university degree).

²¹Religiousness is based on information about very regular church attendance, and imputed for years with missing information from the preceding and subsequent years.

²²In total, 19 sector dummies are defined based on the 2-digit NACE classification with sectors grouped to avoid empty cells.

variable. Arguably, all measures of individual job security might suffer from an endogeneity bias and thus likely do not identify a causal effect of employment uncertainty on fertility. In particular, job security might be the outcome of an occupational selection process that was initially influenced by career and family preferences. Del Bono *et al.* (2012, 2011) and Huttunen and Kellokumpu (2012) look at the fertility effects of job displacements due to plant closures which can be considered exogenous events for the affected individuals. I follow a similar strategy by assuming that the assignment of the civil servant status to Eastern German individuals after German reunification was largely exogenous to these individuals. In contrast, Western Germans can be expected to choose this particular occupation very consciously (Fuchs-Schündeln and Schündeln 2005, Giavazzi and McMahon 2010).

In order to estimate the effect of job security on fertility, I regress conceptions Y_{it} as the measure of fertility of individual i in year t on a dummy variable for being a civil servant CS_{it} which represents the measure of individual job security. The additional covariates X_{it} included in the regressions comprise the personal, household, employment and macroeconomic characteristics discussed above. The inclusion of additional explanatory variables controls for the observable differences between civil servants and other working individuals. In principle, the idea is to regard civil servants as a “treatment group” with comparable white collar employees as the control group (see also Huttunen and Kellokumpu 2012, Del Bono *et al.* 2011).²³

$$P(Y_{it} = 1 | CS_{it}, X_{it}) = G(\beta CS_{it} + X'_{it}\gamma) \quad (1)$$

Following Chase (2003), Bhaumik and Nugent (2010) and Huttunen and Kellokumpu (2012), the employed regression model is a pooled binary choice probit model with standard errors adjusted for clustering on individuals. While many empirical studies of fertility behavior employ duration models (e.g., Kreyenfeld 2010, Adsera 2011), the two estimation strategies are closely related and the probit model allows for more flexibility concerning the probabilities of a conception (Bhaumik and Nugent 2010). In addition, the use of duration models is strongly hindered by the difficulty of defining a starting age. Since the civil servant status can be granted at different ages with life tenure and is likely related to fertility timing, it cannot be considered neither a time-constant nor a time-varying variable.

Like Fuchs-Schündeln and Schündeln (2005), I estimate separate regressions for Western (potential self-selection into the civil servant status) and Eastern Germany (no self-selection). In case of occupational self-selection, we should expect a stronger positive relationship between the civil servant status and fertility in Western Germany. In contrast, a causal impact of job security on fertility should be more pronounced in the Eastern part where the relative advantage in terms of job security is larger for civil servants. The regressions are also run separately for females and males which leaves four different samples. All four groups can be expected to have different fertility behavior, i.e., the determinants of fertility are likely different for men and women, and different for Western and Eastern Germans (Bernardi *et al.* 2007).

²³The inclusion of additional covariates must be seen critically because they potentially create endogeneity biases related to any of these variables. However, the empirical results suggest that such biases are small if anything. In addition, adding more explanatory variables can be seen as another specification test (Del Bono *et al.* 2012).

By definition, only employed individuals can be included in the regressions because interest lies on the relationship between job security and fertility. Consequently, the sample represents only a selected group of the full population. Therefore, the estimated coefficients must be interpreted conditional on being employed before a conception. All individuals who become parents while not working (e.g., those unemployed or in education) are not part of the analysis. This could create a problem if civil servants stay out of the labor force for a very different time span (shorter or longer) than other people. In particular, civil servants might not participate in the labor market for a longer period of time when having children because they are free to take more time off. However, this does not seem to be the case. On average, civil servants are observed for 8.8 years, and other individuals for 8.6 years. In the Western (Eastern) sample, male civil servants are observed 9.2 (9.6) years compared to 8.8 (9.0) years for others, and female civil servants for 8.1 (9.1) years compared to 7.9 (8.6) years. Still, the estimation results primarily address the likelihood of giving birth for employed individuals, which does not necessarily reflect a higher life-time fertility. For instance, women might choose to have a second child very soon after the first while still being out of the labor force. I address this and other critical issues via different sensitivity analyses in the next Section.

5 Estimation results

The regression results of the baseline analysis are presented in Table 2. All presented results are average marginal effects from probit regressions for the probability to conceive a child in the year following the corresponding interview. All regressions include age as well as age squared, and interactions of both with the education indicators.²⁴ The main variable of interest is the dummy variable for civil servants. A statistically significant result (at the 5% significance level) only emerges for Western German females: For them, being a civil servant is associated with a 1.2%-points higher likelihood of conception compared to white collar employees conditional on being employed and all other covariates. Given that the average probability of a conception is approximately 4.5% in this group, this constitutes an economically sizable effect. For Eastern German females, the marginal effect is slightly smaller, but not statistically different from zero. As such, these results suggest that the positive correlation between being a civil servant and conceptions is rather due to a selection of family oriented women into this special occupational status than a “true” causal effect. For men, the estimated effects are even smaller and not distinguishable from zero. In contrast, self-employed men in Western and Eastern Germany are more likely to become fathers than comparable white collar employees.

Regarding personal characteristics, higher education is positively related to parenthood for employed men. For all groups, the strongest positive correlation with conceptions is found for having a steady partner. Being married has an additional positive effect, except for Eastern German women. Higher household income is positively correlated with family formation in Western, but not in Eastern Germany. No significant correlations are found for personal income. The marginal effects are also significantly positive for religiousness, and slightly positive for

²⁴The calculation of the marginal effect for age is based on all estimated coefficients. The age coefficients display the typical hump shape of conceptions over the life cycle which peaks later for the higher educated.

TABLE 2: Estimation results for conceiving a child
(Average marginal effects from probit regressions)

	Males		Females	
	West	East	West	East
Civil servant	-0.002 (0.007)	0.007 (0.011)	0.012** (0.006)	0.009 (0.008)
Blue collar	-0.003 (0.004)	0.008 (0.005)	-0.001 (0.005)	0.002 (0.005)
Entrepreneur	0.012* (0.007)	0.016** (0.008)	-0.010 (0.007)	0.006 (0.010)
Age	-0.005*** (0.000)	-0.003*** (0.000)	-0.004*** (0.000)	-0.002*** (0.000)
Low education	-0.010** (0.004)	0.002 (0.006)	-0.007* (0.004)	-0.012 (0.010)
High education	0.011** (0.004)	0.015*** (0.005)	-0.005 (0.004)	-0.002 (0.004)
Partner	0.049*** (0.007)	0.049*** (0.008)	0.028*** (0.006)	0.018*** (0.006)
Married	0.015*** (0.005)	0.013*** (0.005)	0.017*** (0.004)	0.004 (0.005)
Log HH income	0.014** (0.006)	-0.018** (0.007)	0.009* (0.005)	-0.002 (0.006)
Log personal income	-0.005 (0.005)	0.007 (0.006)	0.003 (0.003)	0.003 (0.004)
Satisfaction with health	0.002* (0.001)	0.001 (0.001)	0.001 (0.001)	-0.001 (0.001)
Religious	0.016*** (0.005)	0.018*** (0.007)	0.006 (0.004)	0.014** (0.006)
1 child	0.020*** (0.004)	-0.009** (0.005)	0.008* (0.004)	-0.016*** (0.004)
2 children	-0.043*** (0.005)	-0.040*** (0.006)	-0.037*** (0.006)	-0.046*** (0.007)
3 or more children	-0.046*** (0.008)	-0.027*** (0.009)	-0.038*** (0.010)	-0.023** (0.011)
Homeowner	0.002 (0.003)	0.009** (0.004)	0.001 (0.003)	0.007 (0.004)
Part-time job	-0.037*** (0.011)	0.007 (0.011)	0.001 (0.005)	0.008* (0.004)
Tenure	-0.000 (0.000)	-0.001*** (0.000)	-0.000 (0.000)	-0.001** (0.000)
Public employer	0.004 (0.006)	0.017*** (0.006)	-0.004 (0.004)	-0.002 (0.005)
Education sector	-0.001 (0.010)	-0.002 (0.013)	0.011 (0.007)	0.019** (0.008)
State unemployment rate	-0.001 (0.001)	0.002** (0.001)	-0.000 (0.001)	0.001 (0.001)
Eastern Germany	0.005 (0.015)	-0.024** (0.011)	0.001 (0.013)	0.003 (0.008)
Company size dummies	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Pseudo R2	0.13	0.16	0.16	0.21
Model p-value	0.000	0.000	0.000	0.000
Observations	21,799	10,828	19,198	11,118

Notes: Table reports average marginal effects from probit regressions incl. employed individuals aged 18 – 45, cluster-robust standard errors in parentheses. The dependent variable indicates a conception after the respective interview. For dummy variables, the marginal effects are the discrete changes from the reference categories: white collar employee, medium education, single, not religious, no children, tenant, employed full-time, private employer, Western Germany. Regressions include age and age squared, and interactions of the educational indicators with age and age squared. Significance levels: *10% **5% ***1%

Source: GSOEP, own calculations

owning a home, especially for Eastern German men. The strongest negative impact on further conceptions emerges for children already born. With the exception of parents with 1 child in Western Germany, the probability of conceiving another child declines with every additional child born.

Regarding occupational characteristics, working part-time is strongly negatively related to fertility for Western German men, and slightly positively for Eastern German females. The marginal effects for firm tenure are negligible. The most interesting sector dummies are “Public employer” and “Education sector” because a large fraction of civil servants works in these two sectors. For Western Germans, no significant relationships emerge. In Eastern Germany, public employment is positively related to conceptions for men which could reflect a positive effect of a generally higher job security in the public sector, and employment in the education sector is positively related to conceptions for women, which could reflect that these women (mostly teachers) have stronger family preferences.

The baseline regressions serve as the starting point for a more detailed analysis. By restricting the sample population further, the reference group of white collar employees becomes more similar to the group of civil servants. In particular, accounting for differences in age, education or employment characteristics in this way should limit the influence of any unobservable differences that might be picked up by the civil servant dummy.²⁵

5.1 Age and birth characteristics

Two obvious differences between civil servants and other individuals that are likely important for fertility behavior relate to age and education. Typically, civil servants are not granted life tenure immediately but only after finishing education and serving a probationary period of 3 years. Until 2009, life tenure was only granted from age 27 onward. Therefore, their birth pattern could follow a different time path. There are also hardly any civil servants with low education, almost all have at least a higher schooling and a vocational, or a university degree. In order to account for these characteristics, all regressions are carried out for two samples: the full sample of individuals between 18 and 45 with low to high education as in the baseline estimations, and a restricted sample of the 25 to 40 year-olds with medium or high education.

Table 3 reports the results for these two samples including interactions of the occupational indicators (civil servant, blue collar employee, self-employed) with age and age squared which are also included in all subsequent regressions, and for the sample split into those younger than 33, or older than 32. The most significant correlations are still found for Western German women, especially when looking at the restricted sample which makes the reference group more comparable to the civil servants. Including age interactions which account for a occupation-specific birth timing patterns, civil servants have an estimated 3.7%-points higher probability

²⁵Table C in the Appendix reports the estimated average marginal effects for being a civil servant from regressions that exclude individuals who are observed for only few or very many years. As argued above, the results do not seem to be driven by sample selection issues, i.e., by civil servants being observed fewer or more times than the rest of the employed. The strongest correlations are generally found for Western German females. For their Eastern German counterparts, the estimated effects are not much smaller but insignificant. For the full sample of 18 – 45 year old men, no significant correlations are found. The results are also robust to the exclusion of individuals who have moved between Eastern and Western Germany from the samples.

TABLE 3: Age pattern
(Marginal effects for being a civil servant)

	Males		Females	
	West	East	West	East
Age 18 – 45, all education levels				
32 or younger	-0.002 (0.019)	-0.006 (0.029)	0.030 (0.019)	-0.013 (0.022)
Observations	5,159	3,168	5,824	3,581
33 or older	-0.003 (0.007)	0.009 (0.012)	0.007 (0.006)	0.039* (0.021)
Observations	16,640	7,475	13,374	6,711
Incl. age interactions	-0.002 (0.007)	0.007 (0.013)	0.014** (0.007)	0.014 (0.011)
Observations	21,799	10,828	19,198	11,118
Age 25 – 40, medium or high education				
32 or younger	-0.007 (0.026)	0.029 (0.048)	0.046* (0.023)	-0.007 (0.026)
Observations	2,926	2,297	3,672	2,576
33 or older	-0.008 (0.014)	0.024 (0.024)	0.027** (0.013)	0.058* (0.031)
Observations	5,736	3,504	5,310	3,401
Incl. age interactions	-0.010 (0.011)	0.029 (0.025)	0.037*** (0.012)	0.022 (0.016)
Observations	8,662	5,898	8,982	6,510

Notes: Table reports average marginal effects from probit regressions for conceiving a child, i.e., the discrete difference between civil servants and the reference category of white collar employees, cluster-robust standard errors in parentheses. Regressions include all covariates from Table 2, and interactions of the occupational indicators with age and age squared in the respective regressions. Significance levels: *10% **5% ***1%
Source: GSOEP, own calculations

of conception than white collar employees, which is more than 50% of the average conception probability in this group of roughly 6.1%. The marginal effect is slightly larger for those of age 32 or younger. In Eastern Germany, the positive correlation between civil servant status and conceptions is driven by older women. In this age group, the effects are statistically significant and even higher than for their Western counterparts. This result points more to a causal effect of job security on conceptions, particularly because self-selection effects should be less pronounced for older individuals in the East. Despite being insignificant, the size and direction of the marginal effects for male Eastern German civil servants also support this finding, especially for the restricted sample. In contrast, all marginal effects are insignificant and even slightly negative for all samples of Western German men.²⁶

The results presented in Table 4 shed light on different aspects related to the timing of births.

²⁶Since it is difficult to distinguish age from cohort and year effects, Tables C and D in the Appendix also report estimation results for samples split by earliest and latest age observed, year of birth and year of observation. The results strengthen the view that the positive correlation between civil servant status and fertility is driven by younger women in the West and by older women in the East. It also appears that the positive correlation found for the latter group emerged after the year 2000, i.e., more than 10 years after reunification, which speaks against a pure causal effect of job security in the East, and could be attributed to a timing/postponement effect (Lechner 2001, Kreyenfeld 2003, Huinink and Kreyenfeld 2005) that was easier achievable for civil servants than for other employees.

When only first births are considered, the estimated marginal effects are similar for the full sample of Western German women, but statistically insignificant. Again, the effect is much stronger in the restricted sample. For Eastern German women, the estimated effects are large (7.1 and 10.4%-points, respectively), but the small sample size with only 139 and 100 civil servant observations makes interpretation difficult. When looking at any future birth, not only in the year following the interview²⁷, significant positive effects are found for civil servants in Western and Eastern Germany, which are again more pronounced in the restricted sample. These results could be evidence that being a civil servant is not only related to a higher probability of conception among the employed, but to higher fertility in general. It also shows that the positive marginal effect for female civil servants cannot be primarily attributed to them having children early (soon after reaching life tenure) and then dropping out of the labor market for an extended period of time, in which case effects should be strongest for first births.

Still, they can work in a different occupation before becoming a civil servant or while being on leave for family reasons. The panel structure of the GSOEP and additional information on job biographies (including individuals' first and last occupations) allow me to identify if a person has ever been a civil servant.²⁸ When a dummy variable for ever being a civil servant is additionally included in the regressions, currently being a civil servant is even more strongly related to conceptions for Western German women, whereas ever being a civil servant is not positively related to fertility. Again, marginal effects are much stronger in the restricted sample, where "Currently civil servant" is associated with a 6.5%-points higher probability of conception, whereas "Ever civil servant" is even negatively correlated with conceptions (5% significance level). For all other samples (men and Eastern German women) no significant correlations are found. In addition to supporting the hypothesis of occupational self-selection into the civil servant status by females in the West, these results suggest a special timing of births, i.e., these females become mothers only when being civil servants. The results also hint at female civil servants not being a selected group of strongly family oriented, but rather family as well as career oriented women.

The last block of results of Table 4 presents results from a different estimation strategy for individuals between age 40 and 50. A dummy variable for having at least 1 child is regressed on a reduced set of covariates which can be assumed to be determined before any children are born in order to avoid endogeneity problems. However, the estimated marginal effects serve only descriptive purposes because of a potential omitted variable bias.²⁹ While the civil servant status is not significantly associated with children in the two East samples, a positive relationship is present in the two West samples. Both male and female civil servants are more likely to have children. Again, this positive relationship increases when only individuals with higher education are considered. With an average likelihood of having children of slightly above 70% (80%) for Western German men (women), the marginal effects of 6.4 - 14.3%-points (3.8 - 11.7%-points) are sizable, especially for individuals with a university degree. The comparison of the estimation

²⁷This approach is similar to Del Bono *et al.* (2011, 2012) who look at births within the next 3, 6 or 9 years.

²⁸Individuals who were educated to become civil servants are also considered as "Ever civil servant". Both groups do not differ significantly with regard to age or other characteristics.

²⁹Included variables are dummies for ever having been a civil servant, publicly employed, or a teacher as well as age, year and cohort dummies, years of education and its square. In order to avoid reverse causality, current employment and socio-economic characteristics, including income, are excluded. Potential omitted variable biases could be due to differences in, e.g., personality, health or marital histories between civil servants and other persons.

TABLE 4: Birth pattern
(Marginal effects for being a civil servant)

	Males		Females	
	West	East	West	East
Age 18 – 45, all education levels				
1st births only	0.003 (0.011)	0.003 (0.024)	0.011 (0.012)	0.071 (0.057)
Observations	8,658	3,280	8,018	2,549
Any birth in future	-0.004 (0.023)	0.001 (0.038)	0.054** (0.021)	0.080* (0.045)
Observations	21,799	10,828	19,198	11,118
Currently civil servant	0.003 (0.009)	-0.003 (0.012)	0.029** (0.014)	0.005 (0.013)
Ever civil servant	-0.005 (0.006)	0.013 (0.009)	-0.008 (0.009)	0.014 (0.021)
Observations	21,799	10,828	19,198	11,118
Age 25 – 40, medium or high education				
1st births only	0.001 (0.016)	0.013 (0.038)	0.030* (0.017)	0.104** (0.049)
Observations	4,826	2,076	4,932	1,596
Any birth in future	-0.042 (0.036)	0.029 (0.055)	0.075** (0.032)	0.119* (0.061)
Observations	9,700	6,645	9,634	6,886
Currently civil servant	-0.003 (0.015)	0.024 (0.035)	0.093** (0.037)	0.014 (0.020)
Ever civil servant	-0.006 (0.011)	0.022 (0.014)	-0.028** (0.012)	0.006 (0.015)
Observations	9,700	6,645	9,634	6,886
Age 40 – 50, ever been civil servant				
All education levels	0.064** (0.028)	-0.039 (0.061)	0.038 (0.025)	-0.016 (0.050)
Observations	14,949	7,735	15,764	8,533
Medium or high education only	0.069** (0.032)	-0.038 (0.061)	0.045 (0.028)	0.025 (0.026)
Observations	8,876	6,441	10,054	7,305
High education only	0.143*** (0.043)	-0.018 (0.079)	0.117** (0.046)	0.044 (0.032)
Observations	3,976	1,682	3,237	1,672

Notes: Table reports average marginal effects from probit regressions for conceiving a child, i.e., the discrete difference between civil servants and the reference category of white collar employees, cluster-robust standard errors in parentheses. Regressions include all covariates from Table 2, and interactions of the occupational indicators with age and age squared in the respective regressions. Last block of regressions for age 40 – 50 reports average marginal effects for having at least 1 child. Respective regressions include an indicator variable for ever having been a civil servant, a teacher or in public employment, age, year and cohort indicators, years of education and years of education squared. Significance levels: *10% **5% ***1%
Source: GSOEP, own calculations

results across samples suggests that the positive relationship found in the West does not represent a causal impact.

5.2 Occupational characteristics

Civil servants also have different occupational characteristics than other employees. In order to make the reference group more similar to civil servants, the samples are restricted to public employees only, employees in the sectors where most civil servants work³⁰, and companies with more than 20 employees that must offer more flexible working conditions to parents than smaller employers.³¹ The estimated marginal effects for being a civil servant are presented in Table 5 and do not differ much from those in the less restricted samples. The only larger differences are found when only civil servant sectors are considered. Here, a small significantly positive correlation is also found for Western German males in the full sample, and even more pronounced for Eastern German males in the restricted sample. The results in the Eastern German samples again suggest a causal effect, in particular for the higher educated. The marginal effects for female Western German civil servants do not vary much across these samples, which supports selection and timing rather than causality as the explanation for the observed correlation. If job security caused the correlation, marginal effects should be smaller for the sample of public employees who all have relatively secure jobs.

5.3 Subjective job security, and family and career orientation

The comparison of estimation results for Western and Eastern Germans as suggested by Fuchs-Schündeln and Schündeln (2005) is a rather indirect test of causality. To test their findings, Bartzsch (2008) included a self-reported measure of financial risk aversion in an empirical analysis of precautionary savings. In this Subsection, I employ a similar strategy by including self-reported worries about job insecurity (Kreyenfeld 2010, Bhaumik and Nugent 2010) and self-reported importance of having children or a successful career (Hener 2010) in the regressions.³² If the civil servant dummy mainly captures an effect of job security, including another measure of job security should reduce the marginal effect. If it mainly captures a selection effect of certain individuals into this particular occupational status, accounting for family and career attitude should impact on the estimated correlations.³³

³⁰These sectors are public administration, education, telecommunication and logistics. More than 90% of civil servants are employed in these sectors where they represent about one third of all employees.

³¹The self-employed are excluded from all of these regressions.

³²While the subjective job security measure is available for every survey year, the importance measure was only reported in 1992, 1995, 2004 and 2008. In order not to lose too many observations, I employ for each individual in each year the latest information available. While this introduces some measurement error, it ensures that the preferences were stated before the conception to avoid reverse causality. The questions are: "What is your attitude toward the following areas? Are you concerned about them? Your job security? [answers:] Very concerned; somewhat concerned; not concerned at all" and "Different individuals find different things in life important. How important are the following things to you today? Have children? Succeed in one's occupation? [answers:] Very important, fairly important; somewhat important; not important." The last two categories are grouped.

³³The well-documented occupational selection due to risk attitudes in Germany (Fuchs-Schündeln and Schündeln 2005, Bonin *et al.* 2007, Pfeifer 2011) could also bias the empirical estimates if risk attitudes were strongly related to family formation. While Schmidt (2008) finds that this is the case for young and well-educated old women, no general effect is found. The timing effects discussed by Schmidt (2008) should be picked up by allowing

TABLE 5: Employer characteristics
(Marginal effects for being a civil servant)

	Males		Females	
	West	East	West	East
Age 18 - 45, all education levels				
Public employers	-0.001 (0.008)	0.005 (0.016)	0.015** (0.007)	0.004 (0.009)
Observations	4,884	1,990	5,808	3,957
Civil servant sectors	0.015* (0.008)	0.021 (0.015)	0.017** (0.007)	0.020 (0.013)
Observations	3,830	1,719	3,860	2,390
More than 20 employees	-0.007 (0.007)	0.016 (0.017)	0.013* (0.008)	0.013 (0.011)
Observations	16,168	7,033	12,153	7,418
Age 25 - 40, medium or high education				
Public employers	-0.010 (0.014)	0.028 (0.025)	0.036*** (0.012)	0.014 (0.016)
Observations	2,423	1,228	3,065	2,306
Civil servant sectors	0.011 (0.014)	0.055** (0.026)	0.037*** (0.012)	0.039* (0.023)
Observations	1,866	989	2,084	1,480
More than 20 employees	-0.016 (0.012)	0.032 (0.027)	0.038*** (0.014)	0.023 (0.016)
Observations	7,370	4,317	6,326	4,552

Notes: Table reports average marginal effects from probit regressions for conceiving a child, i.e., the discrete difference between civil servants and the reference category of white collar employees, cluster-robust standard errors in parentheses. Regressions include all covariates from Table 2, and interactions of the occupational indicators with age and age squared. Significance levels: *10% **5% ***1%
Source: GSOEP, own calculations

The results in Table 6 suggest that job security is not the main driving force behind the positive correlation between civil servant status and fertility. Including subjective job worries leaves the estimated marginal effects for male civil servants virtually unchanged (compared to Table 3). The marginal effects from the female samples are slightly reduced which hints at job security contributing a little bit to the positive correlations. The subjective job security measures themselves are not significantly related to the probability of a conception. Accounting for family and career attitude impacts on the estimation results for Western German women, but not for any other group. The importance measures themselves display the expected direction, more family oriented individuals have a higher, more career oriented individuals a lower probability of becoming parents.³⁴ In case female civil servants were a more family oriented and less career oriented group, one would expect the corresponding marginal effect to decline. However, the opposite is the case. Therefore, female civil servants in Western Germany represent a relatively career oriented group. Together with the relatively strong effects on fertility found in the restricted sample of better educated women, this suggests that selection indeed takes place not exclusively for family reasons, but for reasons of having both, a family and a successful career. In this

for a different age profile of conceptions for civil servants. Any omitted variable bias due to risk attitude should be much smaller than that directly related to family and career intentions.

³⁴Including only either family or career attitude in the regressions produces the same results.

TABLE 6: Subjective indicators of job worries and
the importance of children and career
(Average marginal effects from probit regressions)

	Males		Females	
	West	East	West	East
Age 18 – 45, all education levels				
Civil servant	-0.003 (0.007)	0.011 (0.014)	0.013* (0.007)	0.010 (0.011)
Worried about job	-0.003 (0.003)	0.001 (0.004)	-0.002 (0.003)	-0.003 (0.004)
Very worried about job	-0.001 (0.006)	0.006 (0.005)	-0.002 (0.005)	-0.003 (0.005)
Observations	21,286	10,566	18,694	10,759
Civil servant	-0.005 (0.008)	0.009 (0.014)	0.018** (0.008)	0.015 (0.012)
Children unimportant	-0.013*** (0.004)	-0.013*** (0.005)	-0.025*** (0.004)	-0.011*** (0.004)
Children very important	0.002 (0.004)	-0.000 (0.004)	0.011** (0.004)	0.006 (0.004)
Career unimportant	0.008 (0.006)	0.019** (0.009)	0.004 (0.004)	-0.002 (0.006)
Career very important	-0.008** (0.004)	-0.001 (0.004)	-0.005 (0.004)	0.000 (0.004)
Observations	16,029	8,900	14,188	9,039
Age 25 – 40, medium or high education				
Civil servant	-0.009 (0.012)	0.024 (0.024)	0.034*** (0.012)	0.021 (0.016)
Worried about job	-0.001 (0.006)	-0.000 (0.006)	-0.003 (0.005)	-0.004 (0.006)
Very worried about job	0.001 (0.011)	-0.003 (0.007)	-0.012 (0.008)	-0.002 (0.007)
Observations	9,485	6,494	9,386	6,653
Civil servant	-0.013 (0.013)	0.038 (0.029)	0.041*** (0.013)	0.021 (0.017)
Children unimportant	-0.024*** (0.008)	-0.013* (0.007)	-0.037*** (0.006)	-0.012* (0.006)
Children very important	-0.005 (0.008)	-0.002 (0.006)	0.024*** (0.008)	0.010 (0.006)
Career unimportant	0.024** (0.012)	0.020 (0.013)	0.012 (0.008)	-0.004 (0.009)
Career very important	-0.005 (0.006)	-0.004 (0.005)	-0.010 (0.006)	-0.002 (0.005)
Observations	6,947	5,446	7,066	5,648

Notes: Table reports average marginal effects from probit regressions for conceiving a child, i.e., the discrete differences to the reference categories: white collar employees, not worried about job security, children or career important. cluster-robust standard errors in parentheses. Regressions include all covariates from Table 2, and interactions of the occupational indicators with age and age squared. Significance levels: *10% **5% ***1%
Source: GSOEP, own calculations

respect, the empirical results suggest that the civil servant status offers women good possibilities to combine work and family lives in terms of security, timing and flexibility, which also explains the observed correlations in the sample of Eastern German women.

6 Discussion and conclusion

This paper investigates the relationship between job security and fertility. Following the idea of Fuchs-Schündeln and Schündeln (2005), the special occupational status of civil servants is used as an indicator for very high job and income security, and occupational self-selection is accounted for by comparing separate estimation results for individuals from Western and Eastern Germany. While self-selection into the civil servant status, which also offers good possibilities to combine work and family lives, can be expected in the West, being granted civil servant rights was largely exogenous to Eastern Germans following the “natural experiment” of German reunification. In order to avoid reverse causation from children on employment characteristics, conceptions in the subsequent year are studied.

The empirical analysis is based on large-scale microdata from the 1992 to 2008 waves of the German Socio Economic Panel. No strong evidence is found for a significant correlation between the civil servant status and future conceptions for men, especially in Western Germany. In contrast, being a civil servant is strongly correlated with the likelihood of a conception for women. Among Western German women, the average marginal effect for being a civil servant is approximately 1.4%-points for the employed between age 18 and 45, conditional on individual socio-economic and employment characteristics. For a restricted sample of employed Western German women between 25 and 40 with at least an intermediate level of education who resemble a typical civil servant more closely, the effect is even 3.7% points. These effects are sizable compared to the average conception probabilities of 4.5% and 6.1%. For Eastern German women, the observed overall correlations are similar with 1.4% and 2.2%, respectively, but not always statistically significantly different from zero. Significant effects are found among Eastern German women when considering first births only, only women older than 32, or only those working in the industry sectors where most civil servants are employed.

The positive empirical correlation between the civil servant status and conceptions for females is due to a combination of selection, timing and causal effects. The positive correlations observed in Eastern Germany (to a smaller and insignificant degree also for men) suggests that a causal link exists. These correlations are mainly driven by women born before 1970, and by observations from 2000 onward. While the former finding supports causality because selection should be less pronounced for women who had already made their educational choices before reunification, the latter rather points to a timing effect, i.e., women who were (or expected to be) granted civil servant status could more easily adapt to Western German fertility patterns and delay births, which is seen as important reasons for the large drop of birth rates in Eastern Germany after 1990 (e.g., Kreyenfeld 2010, Lechner 2001).

In most specifications, marginal effects are more pronounced and more significant for Western than for Eastern German women, which strongly supports that occupational self-selection drives much of the empirical results. The positive correlation between being a civil servant and con-

ceptions emerges for the current occupational status, not for ever being a civil servant, which points to selection as well as special timing effects. As an additional test, subjective job security perceptions are accounted for in the regressions which leaves the estimates concerning the civil servant status virtually unchanged. In contrast, accounting for the subjective importance of having children, or a successful career increases the marginal effects for Western German women. This suggests that female civil servants are not primarily a selected group of very family oriented individuals, but rather a selected group of women who want to have both a family and a successful career. This interpretation also has the potential to explain why the marginal effects are much stronger in the restricted sample of higher educated women between 25 and 40. Here, the reference group of employed female white collar workers likely consists of rather career oriented women whereas in the full sample, the reference group includes many rather family oriented women.

In sum, this paper demonstrates a strong link between labor market and demographic outcomes for women. I interpret the significant positive empirical relationship between job security and fertility as the result of a dominating occupational selection effect coupled with a particular birth timing pattern and a small direct causal impact. These effects appear to be strongest for higher educated females who want to combine work and family lives. Given the demographic development of an aging society in Germany and many other developed countries, the compatibility of occupational careers with having children is of primary public, social and economic concern, as evidenced by the recent family policy reform in Germany. The findings are also of interest to employers who aim at attracting more highly qualified female employees. Sheran (2007), Ma (2010) and Adda *et al.* (2011) already address educational, occupational and family choices jointly. Still, much room is left for addressing the importance of non-pecuniary and other not directly job-related motives for occupational choices and labor market outcomes in future research.

References

- ADDA, J., DUSTMANN, C., AND STEVENS, K. 2011. *The career costs of children*. IZA Discussion Papers 6201. Institute for the Study of Labor (IZA).
- ADLER, M. A. 1997. Social change and declines in marriage and fertility in Eastern Germany. *Journal of Marriage and Family*, **59**(1), 37–49.
- ADSERA, A. 2005. Vanishing children: From high unemployment to low fertility in developed countries. *American Economic Review*, **95**(2), 189–193.
- ADSERA, A. 2011. Where are the babies? Labor market conditions and fertility in Europe. *European Journal of Population/Revue Européenne de Démographie*, **27**(1), 1–32.
- ALESINA, A., AND FUCHS-SCHÜNDELN, N. 2007. Goodbye Lenin (or not?): The effect of communism on people. *American Economic Review*, **97**(4), 1507–1528.
- BARTZSCH, N. 2008. Precautionary saving and income uncertainty in Germany – New evidence from microdata. *Journal of Economics and Statistics (Jahrbücher für Nationalökonomie und Statistik)*, **228**(1), 5–24.
- BAUERNSCHUSTER, S., AND RAINER, H. 2011. Political regimes and the family: How sex-role attitudes continue to differ in reunified Germany. *Journal of Population Economics*, **25**(1), 5–27.
- BBESG. *Bundesbesoldungsgesetz*. German federal remuneration law of June 19, 2009 (BGBl. I S. 1434), last change: article 11 of the law of Apr. 28, 2011 (BGBl. I S. 678).
- BBG. *Bundesbeamtengesetz*. German federal civil servant law of Feb. 5, 2009 (BGBl. I S. 160), last change: article 13 of the law of Apr. 28, 2011 (BGBl. I S. 687).
- BECKER, G. S. 1960. An economic analysis of fertility. *Pages 209–231 of: Demographic and economic change in developed countries*. NBER Chapters. National Bureau of Economic Research, Inc.
- BEEG. *Bundeselterngeld und -elternzeitgesetz*. German federal parental benefit and leave law of Dec. 5, 2006 (BGBl. I S. 2748), last change: article 14 of the law of Dec. 9, 2010 (BGBl. I S. 1885).
- BENITO, A. 2006. Does job insecurity affect household consumption? *Oxford Economic Papers*, **58**(1), 157–181.
- BERNARDI, L., KLÄRNER, A., AND LIPPE, H. 2007. Job insecurity and the timing of parenthood: A comparison between Eastern and Western Germany. *European Journal of Population/Revue Européenne de Démographie*, **24**(3), 287–313.
- BHAUMIK, S. K., AND NUGENT, J. B. 2010. Real options and demographic decisions: Empirical evidence from East and West Germany. *Applied Economics*, **43**(21), 2739–2749.
- BLAKEMORE, A. E., AND LOW, S. A. 1984. Sex differences in occupational selection: The case of college majors. *Review of Economics and Statistics*, **66**(1), 157–63.

- BONIN, H., AND ZIMMERMANN, K. F. 2000. *The post-unification German labor market*. IZA Discussion Papers 185. Institute for the Study of Labor (IZA).
- BONIN, H., DOHMEN, T., FALK, A., HUFFMAN, D., AND SUNDE, U. 2007. Cross-sectional earnings risk and occupational sorting: The role of risk attitudes. *Labour Economics*, **14**(6), 926–937.
- BREDTMANN, J., KLUVE, J., AND SCHAFFNER, S. 2009. *Women’s fertility and employment decisions under two political systems – Comparing East and West Germany before reunification*. Ruhr Economic Papers 149. Rheinisch-Westfälisches Institut für Wirtschaftsforschung, Ruhr-Universität Bochum, Universität Dortmund, Universität Duisburg-Essen.
- BROSE, N. 2008. Entscheidung unter Unsicherheit: Familiengründung und -erweiterung im Erwerbsverlauf. *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie*, **60**(1), 30–52.
- BROWNING, M. 1992. Children and household economic behavior. *Journal of Economic Literature*, **30**(3), 1434–75.
- BURGARD, S. A., BRAND, J. E., AND HOUSE, J. S. 2009. Perceived job insecurity and worker health in the United States. *Social Science & Medicine*, **69**(5), 777–785.
- CARROLL, C. D., DYNAN, K. E., AND KRANE, S. D. 2003. Unemployment risk and precautionary wealth: Evidence from households’ balance sheets. *Review of Economics and Statistics*, **85**(3), 586–604.
- CHASE, R. S. 2003. Household fertility responses following communism: Transition in the Czech Republic and Slovakia. *Journal of Population Economics*, **16**(3), 579–595.
- CONRAD, C., LECHNER, M., AND WERNER, W. 1996. East German fertility after unification: Crisis or adaptation? *Population and Development Review*, **22**(2), 331–358.
- CRAMER, J. C. 1980. Fertility and female employment: Problems of causal direction. *American Sociological Review*, **45**(2), 167–190.
- DANZER, N. 2011 (September). *Job satisfaction and self-selection into the public and private sector: Evidence from a natural experiment*. Paper presented at the 23rd Annual Conference of the European Association of Labour Economists, Paphos, Cyprus.
- DEL BONO, E., WEBER, A., AND WINTER-EBMER, R. 2011. *Fertility and economic instability: The role of unemployment and job displacement*. Economics Working Papers 2011-01. Department of Economics, Johannes Kepler University Linz, Austria.
- DEL BONO, E., WEBER, A., AND WINTER-EBMER, R. 2012. Clash of career and family: Fertility decisions after job displacement. *Journal of the European Economic Association*. forthcoming.
- FEDERAL EMPLOYMENT AGENCY. 2011. *Arbeitslosigkeit im Zeitverlauf*. Nuremberg, Germany: German Federal Employment Agency. <http://statistik.arbeitsagentur.de>.

- FEDERAL STATISTICAL OFFICE. 2011a. *Bevölkerung und Erwerbstätigkeit: Natürliche Bevölkerungsbewegungen 2009*. Wiesbaden, Germany: German Federal Statistical Office. Fachserie 1 Reihe 1.1.
- FEDERAL STATISTICAL OFFICE. 2011b. *Finanzen und Steuern: Personal des öffentlichen Dienstes*. Wiesbaden, Germany: German Federal Statistical Office. Fachserie 14 Reihe 6, various issues and special reports.
- FEDERAL STATISTICAL OFFICE. 2011c. *Mikrozensus: Bevölkerung und Erwerbstätigkeit. Stand und Entwicklung der Erwerbstätigkeit*. Wiesbaden, Germany: German Federal Statistical Office. Fachserie 1 Reihe 4.1.1, various issues.
- FRANCESCONI, M. 2002. A joint dynamic model of fertility and work of married women. *Journal of Labor Economics*, **20**(2), 336–380.
- FRIJTERS, P., HAIKEN-DENEW, J. P., AND SHIELDS, M. A. 2004. Money does matter! Evidence from increasing real income and life satisfaction in East Germany following reunification. *American Economic Review*, **94**(3), 730–740.
- FUCHS-SCHÜNDELN, N., AND SCHÜNDELN, M. 2005. Precautionary savings and self-selection: Evidence from the German reunification “experiment”. *Quarterly Journal of Economics*, **120**(3), 1085–1120.
- GIAVAZZI, F., AND MCMAHON, M. 2010. Policy uncertainty and household savings. *Review of Economics and Statistics*, **94**(2), 517–531.
- GREEN, F. 2011. Unpacking the misery multiplier: How employability modifies the impacts of unemployment and job insecurity on life satisfaction and mental health. *Journal of Health Economics*, **30**(2), 265–276.
- HAIKEN-DENEW, J. P., AND FRICK, J. R. 2005. *DTC - Desktop companion to the German Socio-Economic Panel (SOEP)*. Berlin: DIW.
- HAIKEN-DENEW, J. P., AND HAHN, M. H. 2010. PanelWhiz: Efficient data extraction of complex panel data sets – An example using the German SOEP. *Schmollers Jahrbuch: Journal of Applied Social Science Studies/Zeitschrift für Wirtschafts- und Sozialwissenschaften*, **130**(4), 643–654.
- HENER, T. 2010. *Do couples bargain over fertility? Evidence based on child preference data*. Ifo Working Paper Series 92. Ifo Institute for Economic Research at the University of Munich.
- HONDROYIANNIS, G. 2009. Fertility determinants and economic uncertainty: An assessment using European panel data. *Journal of Family and Economic Issues*, **31**(1), 33–50.
- HOTZ, V. J., AND MILLER, R. A. 1988. An empirical analysis of life cycle fertility and female labor supply. *Econometrica*, **56**(1), 91–118.
- HUININK, J., AND KREYENFELD, M. 2005. Family formation in times of social and economic change: An analysis of the East German cohort in 1971. *Chap. 8, pages 170–190 of: DIEWALD,*

- M., GOEDECKE, A., AND MAYER, K. U. (eds), *After the fall of the Wall: Life courses in the transformation of East Germany*. Palo Alto, CA: Stanford University Press.
- HUMLUM, M. K., KLEINJANS, K. J., AND NIELSEN, H. S. 2012. An economic analysis of identity and career choice. *Economic Inquiry*, **50**(1), 39–61.
- HUTTUNEN, K., AND KELLOKUMPU, J. 2012 (March). *The effect of job displacement on couples' fertility decisions*. Working Papers 29. Government Institute for Economic Research Finland (VATT).
- KARPEN, U., AND MAASS, V. 1992. Der schwierige Weg zur Einheit. Die Umsetzung der beamtenrechtlichen Regelungen des Einigungsvertrags in der Praxis. *NVwZ: Neue Zeitschrift für Verwaltungsrecht*, **11**(10), 942–948.
- KELLER, B., AND HENNEBERGER, F. 1992. Beschäftigung und Arbeitsbeziehungen im öffentlichen Dienst der neuen Bundesländer. *Gewerkschaftliche Monatshefte*, **43**(6), 331–342.
- KLUVE, J., AND TAMM, M. 2009 (October). *Now daddy's changing diapers and mommy's making her career – Evaluating a generous parental leave regulation using a natural experiment*. Ruhr Economic Papers 145. Rheinisch-Westfälisches Institut für Wirtschaftsforschung, Ruhr-Universität Bochum, Universität Dortmund, Universität Duisburg-Essen.
- KNABE, A., AND RÄTZEL, S. 2010. Better an insecure job than no job at all? Unemployment, job insecurity and subjective wellbeing. *Economics Bulletin*, **30**(3), 2486–2494.
- KREYENFELD, M. 2003. Crisis or adaptation reconsidered: A comparison of East and West German fertility patterns in the first six years after the “Wende”. *European Journal of Population/Revue Européenne de Démographie*, **19**(3), 303–329.
- KREYENFELD, M. 2004. Fertility decisions in the FRG and GDR: An analysis with data from the German Fertility and Family Survey. *Demographic Research Special Collections*, **3**(11), 275–318.
- KREYENFELD, M. 2010. Uncertainties in female employment careers and the postponement of parenthood in Germany. *European Sociological Review*, **26**(3), 351–366.
- LALIVE, R., AND ZWEIMÜLLER, J. 2009. How does parental leave affect fertility and return to work? Evidence from two natural experiments. *Quarterly Journal of Economics*, **124**(3), 1363–1402.
- LÜCHINGER, S., STUTZER, A., AND WINKELMANN, R. 2010a. Self-selection models for public and private sector job satisfaction. *Research in Labor Economics*, **30**(April), 233–251.
- LÜCHINGER, S., MEIER, S., AND STUTZER, A. 2010b. Why does unemployment hurt the employed? *Journal of Human Resources*, **45**(4), 998–1045.
- LECHNER, M. 2001. The empirical analysis of East German fertility after unification: An update. *European Journal of Population/Revue Européenne de Démographie*, **17**(1), 61–73.

- MA, B. 2010. *The occupation, marriage, and fertility choices of women: A life-cycle model*. UMBC Economics Department Working Papers 10-123. UMBC Department of Economics.
- MERON, M., AND WIDMER, I. 2002. Unemployment leads women to postpone the birth of their first child. *Population*, **57**(2), 301–330. Translated by D. Shapiro.
- MICHAUD, P.-C., AND TATSIRAMOS, K. 2011. Fertility and female employment dynamics in Europe: the effect of using alternative econometric modeling assumptions. *Journal of Applied Econometrics*, **26**(4), 641–668.
- NAKAMURA, A., AND NAKAMURA, M. 1992. The econometrics of female labor supply and children. *Econometric Reviews*, **11**(1), 1–71.
- PFEIFER, C. 2011. Risk aversion and sorting into public sector employment. *German Economic Review*, **12**(1), 85–99.
- POLACHEK, S. W. 1981. Occupational self-selection: A human capital approach to sex differences in occupational structure. *Review of Economics and Statistics*, **63**(1), 60–69.
- QUINT, P. E. 1997. *The imperfect union: Constitutional structures of German reunification*. Princeton, New Jersey: Princeton University Press.
- RANJAN, P. 1999. Fertility behaviour under income uncertainty. *European Journal of Population/Revue Européenne de Démographie*, **15**(1), 25–43.
- REDDING, S. J., AND STURM, D. M. 2008. The costs of remoteness: Evidence from German division and reunification. *American Economic Review*, **98**(5), 1766–97.
- REICHERT, A., AND TAUCHMANN, H. 2011 (July). *The causal impact of fear of unemployment on psychological health*. Ruhr Economic Papers 266. Rheinisch-Westfälisches Institut für Wirtschaftsforschung, Ruhr-Universität Bochum, Universität Dortmund, Universität Duisburg-Essen.
- ROSENZWEIG, M. R., AND WOLPIN, K. I. 1980. Life-cycle labor supply and fertility: Causal inferences from household models. *Journal of Political Economy*, **88**(2), 328–48.
- SCHMIDT, L. 2008. Risk preferences and the timing of marriage and childbearing. *Demography*, **45**(2), 439–460.
- SCHMITT, C. 2012. A cross-national perspective on unemployment and first births. *European Journal of Population/Revue Européenne de Démographie*, June. Online first.
- SCHRÖDER, J., AND BRÜDERL, J. 2008. Der Effekt der Erwerbstätigkeit von Frauen auf die Fertilität: Kausalität oder Selbstselektion? (Female labor force participation and fertility: An analysis of the transition to parenthood in West Germany). *Zeitschrift für Soziologie*, **37**(2), 117–136.
- SCHWANENGEL, W. 1999. *Die Wiedereinführung des Berufsbeamtentums in den neuen Ländern*. Beiträge zum Beamtenrecht, Band 6. Berlin: Duncker und Humblot.

- SHERAN, M. 2007. The career and family choices of women: A dynamic analysis of labor force participation, schooling, marriage, and fertility decisions. *Review of Economic Dynamics*, **10**(3), 367–399.
- SOBOTKA, T., SKIRBEKK, V., AND PHILIPPOV, D. 2011. Economic recession and fertility in the developed world. *Population and Development Review*, **37**(2), 267–306.
- TAMM, M. 2010. Child benefit reform and labor market participation. *Journal of Economics and Statistics (Jahrbuecher fuer Nationaloekonomie und Statistik)*, **230**(3), 313–327.
- TÖLKE, A., AND DIEWALD, M. 2003. Insecurities in employment and occupational careers and their impact on the transition to fatherhood in Western Germany. *Demographic Research*, **9**(3), 41–68.
- WAGNER, G. G., FRICK, J. R., AND SCHUPP, J. 2007. The German Socio-Economic Panel Study (SOEP) – Scope, Evolution and Enhancements. *Schmollers Jahrbuch: Journal of Applied Social Science Studies/Zeitschrift für Wirtschafts- und Sozialwissenschaften*, **127**(1), 139–169.
- WATTS, A. 2008 (January). *Career and family choices in the presence of uncertainty*. Department of Economics Discussion Papers 60. Southern Illinois University Carbondale.
- WITTE, J. C., AND WAGNER, G. G. 1995. Declining fertility in East Germany after unification: A demographic response to socioeconomic change. *Population and Development Review*, **21**(2), 387–397.
- ZEDECK, S. 1992. Introduction: Exploring the domain of work and family concerns. Work, families, and organizations. In: ZELDECK, S. (ed), *Work, families, and organizations (Frontiers of industrial and organizational psychology)*. San Francisco, CA, US: Jossey-Bass. The Jossey-Bass management series and The Jossey-Bass social and behavioral science series, Vol. 5.

Appendix: Additional tables

TABLE A: Descriptive statistics
for the pooled sample of employed males, age 18 – 45

	West in 1989		East in 1989	
	Others	Civil servants	Others	Civil servants
Conception of child	0.052 (0.222)	0.051 (0.220)	0.036 (0.186)	0.050 (0.218)
Child born	0.060 (0.238)	0.060 (0.238)	0.042 (0.201)	0.043 (0.204)
Any children	0.60 (0.49)	0.63 (0.48)	0.70 (0.46)	0.65 (0.48)
Number of children	1.11 (1.10)	1.17 (1.10)	1.18 (0.97)	0.99 (0.85)
Age	36.67 (5.57)	37.61 (5.50)	36.04 (5.99)	34.83 (6.53)
Partner	0.82 (0.38)	0.87 (0.33)	0.86 (0.34)	0.81 (0.39)
Married	0.67 (0.47)	0.75 (0.43)	0.66 (0.47)	0.64 (0.48)
Household income	3024.39 (1248.85)	3365.47 (1087.07)	2582.07 (1030.40)	2976.64 (998.34)
Personal income	3335.42 (1506.73)	3023.95 (945.40)	2233.73 (1097.74)	2307.10 (656.89)
Satisfaction with health	7.23 (1.86)	7.41 (1.84)	7.07 (1.82)	7.29 (1.78)
Religious	0.13 (0.33)	0.21 (0.40)	0.06 (0.23)	0.02 (0.15)
Years of education	12.81 (2.62)	13.71 (2.85)	12.66 (2.31)	13.39 (2.53)
Homeowner	0.47 (0.50)	0.61 (0.49)	0.38 (0.49)	0.32 (0.47)
Part-time job	0.04 (0.19)	0.02 (0.13)	0.02 (0.16)	0.01 (0.08)
Tenure	8.63 (7.02)	13.42 (7.87)	6.60 (6.19)	9.51 (5.91)
Number of employees	3.34 (1.35)	4.35 (0.87)	2.98 (1.26)	4.43 (0.86)
Public employer	0.14 (0.35)	0.97 (0.16)	0.15 (0.36)	0.99 (0.08)
Education sector	0.02 (0.14)	0.15 (0.36)	0.03 (0.17)	0.04 (0.19)
Eastern Germany	0.01 (0.10)	0.01 (0.09)	0.88 (0.33)	0.86 (0.34)
State unemployment rate	9.31 (2.72)	9.39 (2.55)	17.07 (3.86)	17.24 (3.84)
Observations	19,589	2,210	10,345	483

Notes: Table reports variable means for the pooled sample of employed males from 1992 to 2008, standard deviations in parentheses.

Source: GSOEP, own calculations

TABLE B: Descriptive statistics
for the pooled sample of employed females, age 18 – 45

	West in 1989		East in 1989	
	Others	Civil servants	Others	Civil servants
Conception of child	0.042 (0.200)	0.060 (0.238)	0.031 (0.174)	0.060 (0.237)
Child born	0.013 (0.115)	0.017 (0.130)	0.006 (0.080)	0.013 (0.111)
Any children	0.59 (0.49)	0.54 (0.50)	0.77 (0.42)	0.56 (0.50)
Number of children	1.09 (1.10)	0.95 (1.05)	1.33 (0.94)	0.90 (0.91)
Age	35.87 (6.29)	36.28 (6.03)	35.62 (6.49)	33.20 (7.00)
Partner	0.79 (0.41)	0.77 (0.42)	0.84 (0.37)	0.78 (0.42)
Married	0.61 (0.49)	0.59 (0.49)	0.65 (0.48)	0.50 (0.50)
Household income	3057.22 (1401.62)	3722.73 (1464.50)	2667.16 (1103.13)	3234.40 (1292.33)
Personal income	1778.62 (1160.39)	2293.67 (882.45)	1706.20 (865.98)	2147.96 (791.22)
Satisfaction with health	7.23 (1.96)	7.18 (1.95)	7.00 (1.90)	7.44 (1.87)
Religious	0.17 (0.37)	0.21 (0.40)	0.06 (0.24)	0.05 (0.22)
Years of education	12.52 (2.28)	15.09 (2.74)	12.91 (2.16)	14.87 (2.61)
Homeowner	0.46 (0.50)	0.50 (0.50)	0.39 (0.49)	0.36 (0.48)
Part-time job	0.51 (0.50)	0.41 (0.49)	0.29 (0.45)	0.17 (0.37)
Tenure	6.75 (6.28)	11.19 (7.79)	6.93 (6.50)	7.17 (5.27)
Number of employees	3.00 (1.35)	4.11 (1.02)	3.05 (1.27)	3.91 (0.87)
Public employer	0.26 (0.44)	0.95 (0.22)	0.36 (0.48)	0.99 (0.08)
Education sector	0.06 (0.23)	0.38 (0.49)	0.09 (0.29)	0.17 (0.38)
Eastern Germany	0.01 (0.09)	0.02 (0.13)	0.87 (0.34)	0.77 (0.42)
State unemployment rate	9.39 (2.75)	9.89 (3.17)	17.03 (3.84)	16.71 (4.42)
Observations	17,749	1,449	10,799	319

Note: Table reports variable means for the pooled sample of employed females from 1992 to 2008, standard deviations in parentheses.
Source: GSOEP, own calculations

TABLE C: Number of observations and observed age
(Marginal effects for being a civil servant)

	Males		Females	
	West	East	West	East
18 - 45 years old, all education levels				
No movers	-0.002 (0.007)	0.001 (0.011)	0.014** (0.007)	0.012 (0.012)
Observations	21,565	9,476	19,012	9,632
At least 5 observations	-0.009 (0.007)	0.007 (0.015)	0.016** (0.008)	0.014 (0.012)
Observations	18,174	9,092	15,084	9,031
Not more than 10 observations	0.003 (0.008)	0.023 (0.022)	0.011 (0.007)	0.015 (0.015)
Observations	14,137	6,819	14,270	7,226
Observed before age 33	-0.011 (0.010)	0.003 (0.019)	0.022** (0.011)	0.007 (0.014)
Observations	11,900	6,302	11,400	6,754
Observed after age 32	-0.002 (0.007)	0.016 (0.016)	0.012* (0.007)	0.013 (0.011)
Observations	20,410	9,734	17,109	9,545
25 - 40 years old, medium or high education				
No movers	-0.008 (0.012)	0.018 (0.022)	0.034*** (0.012)	0.019 (0.017)
Observations	9,558	5,775	9,517	5,958
At least 5 observations	-0.013 (0.013)	0.024 (0.026)	0.040*** (0.014)	0.018 (0.016)
Observations	7,589	5,303	7,081	5,075
Not more than 10 observations	-0.004 (0.013)	0.035 (0.030)	0.030** (0.012)	0.026 (0.021)
Observations	7,413	5,009	8,055	5,553
Observed before age 33	-0.017 (0.014)	0.027 (0.030)	0.041*** (0.015)	0.012 (0.017)
Observations	6,846	4,809	7,291	5,085
Observed after age 32	-0.009 (0.012)	0.047 (0.031)	0.028** (0.012)	0.018 (0.015)
Observations	8,929	5,939	8,473	5,930

Notes: Table reports average marginal effects from probit regressions for conceiving a child, i.e., the discrete difference between civil servants and the reference category of white collar employees, cluster-robust standard errors in parentheses. Regressions include all covariates from Table 2, and interactions of the occupational indicators with age and age squared. Significance levels: *10% **5% ***1%

Source: GSOEP, own calculations

TABLE D: Cohort and year pattern
(Marginal effects for being a civil servant)

	Males		Females	
	West	East	West	East
Age 18 - 45, all education levels				
1995 - 2005	-0.001 (0.008)	-0.001 (0.013)	0.011 (0.008)	0.009 (0.015)
Observations	14,932	7,119	13,012	7,284
Born before 1970	0.000 (0.007)	0.009 (0.015)	0.014* (0.008)	0.030 (0.019)
Observations	17,450	7,955	14,228	7,047
Born after 1970	-0.010 (0.018)	-0.005 (0.030)	0.024 (0.016)	-0.018 (0.021)
Observations	4,326	2,615	4,970	3,004
Before 2000	-0.009 (0.010)	0.002 (0.014)	0.002 (0.011)	-0.004 (0.009)
Observations	9,059	5,607	7,599	5,539
After 2000	0.002 (0.009)	0.015 (0.020)	0.022** (0.009)	0.009 (0.014)
Observations	14,653	6,017	13,163	6,363
Age 25 - 40, medium or high education				
1995 - 2005	-0.008 (0.011)	0.024 (0.023)	0.035*** (0.012)	0.025 (0.017)
Observations	9,700	6,645	9,634	6,886
Born before 1970	-0.005 (0.013)	0.042 (0.036)	0.032** (0.015)	0.053* (0.032)
Observations	6,770	4,566	6,250	4,217
Born after 1970	-0.019 (0.022)	-0.003 (0.036)	0.053** (0.022)	-0.012 (0.025)
Observations	2,893	2,014	3,331	2,210
Before 2000	-0.017 (0.017)	0.014 (0.024)	0.016 (0.018)	0.003 (0.013)
Observations	3,861	3,553	3,773	3,600
After 2000	-0.003 (0.014)	0.037 (0.036)	0.044*** (0.015)	0.021 (0.023)
Observations	6,705	3,565	6,693	3,756

Notes: Table reports average marginal effects from probit regressions for conceiving a child, i.e., the discrete difference between civil servants and the reference category of white collar employees, cluster-robust standard errors in parentheses. Regressions include all covariates from Table 2, and interactions of the occupational indicators with age and age squared. Significance levels: *10% **5% ***1%
Source: GSOEP, own calculations