Effects of different divorce probabilities on female labor force participation and fertility

Kneip, Thorsten; Bauer, Gerrit

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Thorsten Kneip

Gerrit Bauer

UNIVERSITÄT MANNHEIM

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Editorial Note:

Thorsten Kneip *is a researcher at the Mannheim Centre for European Social Research (MZES). He is currently working on a research project on social embeddedness and the stability of intimate relationships founded by the German Science Foundation (Deutsche Forschungsgemeinschaft). His main research interests include the sociology of the family, social network analysis and the measurement of social capital – all with particular respect to partnership instability.*

Gerrit Bauer *is a researcher at the Mannheim Centre for European Social Research (MZES). Currently, he is preparing a research project on homogamy and fertility. His main research interests include the sociology of the family, especially the modeling of household decisions on fertility.*

Abstract

During the last decades, increases in divorce rates and female labor force participation have taken place all across Europe. At the same time, fertility rates have markedly sunk. While the causal relation between fertility and female labor force participation has been discussed extensively, we address the possibility of the rise in divorce risk and the change in divorce regimes as antecedents of both, risen female labor force participation and low fertility rates. We argue that unilateral divorce regimes increase married women's investments in market related human capital as opposed to investments in household productivity skills. The reason is that this should lower their threat points and thus their marital bargaining power as well as their outside options. Furthermore, also higher probabilities of getting divorced should reduce the propensity of rationally acting wives to accumulate marital specific capital if husbands can unilaterally leave the marriage. We use longitudinal data on 18 European countries covering 45 years and present fixed-effects regression models to identify the causal effects of divorce regime and divorce rates on fertility and female labor force participation rates. In a second step, we analyze event history data on German married and divorced couples using predicted divorce risks as the main explanatory variable. Our findings confirm the hypothesized effects of divorce regime and divorce probability on female labor force participation and fertility, if divorce probabilities are measured as predicted divorce risks. However, divorce rates are inappropriate proxy measures for divorce probabilities.

Contents

Introduction

Since the late 1960s divorce rates have markedly risen virtually all across Europe and the industrialized world. During that same period a number of other changes have remarkably taken place as well. The rise in divorce rates is typically accompanied by an increase in female labor force participation and a drop of fertility rates in the same time slot (Figure 1)[1]. Moreover, almost every industrialized country has implemented revised divorce laws or has undergone changes in the application of existing laws in the legal practice since the early 1970s. Of primary concern here are the introduction of no-fault grounds and the possibility to unilaterally file for divorce, in other words, the establishment of a unilateral divorce regime.

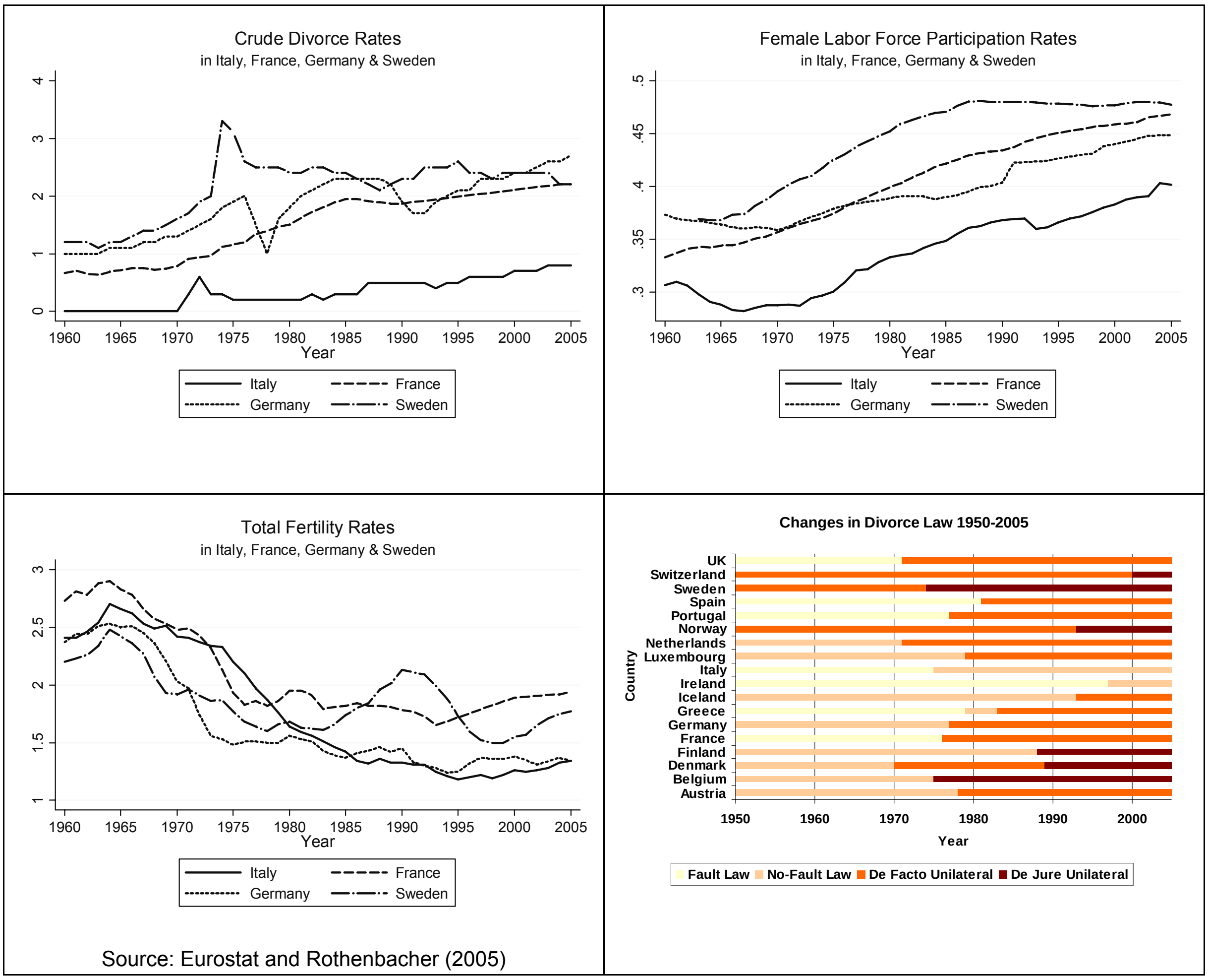

Figure 1: Recent Trends in Selected European Countries

1 The country selection for the illustration of the presented trends is rather arbitrary and mainly because depicting 18 countries would have been confusing. We decided to select four countries that differ in the pattern of institutional changes in the considered time period.

Out of doubt these associations are not only a remarkable coincidence. The possible effects of female market income on marital stability, for example, are largely discussed (e.g. Rogers 2004). It is widely accepted that the existence of children – at least if they are still small – has a stabilizing effect on marriages (e.g. Lillard und Waite 1993). And whereas the causal direction is not quite clear there is an association between female labor force participation and fertility decisions (Schröder 2006).

In this paper we address the questions of whether divorce regimes and divorce probabilities affect women's labor supply and fertility behavior and how they themselves are linked in the first place. Although these questions have been tried to answer elsewhere, we hope to make a substantial contribution to the ongoing discussion.

Theoretical Background

Bargaining Over Divorce

A number of studies have examined the possible effect of divorce law on divorce rates. Though the relationship of more or less restrictive laws and the probability of divorces to occur intuitively seems plausible, theoretical positions on this issue are more complex and empirical findings are heterogeneous. It has been argued in the literature that possible effects of divorce law on divorce behavior depend on the extent to which utility is transferable between partners (Fella, Manzini und Martiotti 2004; Zelder 2002). Assuming transferability and fully applying the Coase Theorem leads to predicting that there should be no effect at all. The logic is as follows: If property rights in marriage were well defined, under bilateral (i.e. mutual-consent) law the spouse who wants to divorce must bribe the spouse who wants to stay married in order to convince him or her to agree to the divorce. Under unilateral divorce law, the spouse who wants to stay in marriage must bribe the spouse who wants to get out. In either case, divorce only occurs if it is efficient, that is if there is no way to make both partners better off within marriage (Becker, Landes und Michael 1977; Landes 1978). Zelder (1993) on the other hand considered whether the divorce regime has an effect on the divorce rate when bargaining involves public goods. In his model, children, for example, were treated as a public good for marital bargaining but as private good for divorce bargaining. Because of the joint consumption of public goods, gains to marriage cannot be transferred from one spouse to the other within marriage and some marriages will be inefficiently dissolved in a unilateral, although not in a bilateral divorce regime. Under such circumstances, a spouse wanting out of marriage can just unilaterally walk away because he or she cannot be persuaded to stay by utility transfers.

Figure 2 depicts the possible scenarios under which bargaining over divorce may occur. In scenarios a) and b) the spouses consensually divorce or stay married, respectively: In case a) both prefer divorce over marriage, in case b) both are better off when staying married. Here switching to a unilateral divorce regime will have no effect on the bargaining outcome. Scenario c) where the gains to separation for one partner exceed the losses of the other clearly leads to a separation as long as marital assets can be divided *after* divorce. In this case divorce law has only distributional effects (D_b

vs. D_u), but will never avert divorce. However, if marital gains exceed the utilities after divorce (scenario d) the outcome is dependent on divorce law if the possibility of utility transfers *within* marriage is limited. While under bilateral divorce law the couple will stay married (M_b), they will only do so under unilateral divorce law if utility transfers are possible (M_u). Otherwise they will divorce (D_u).

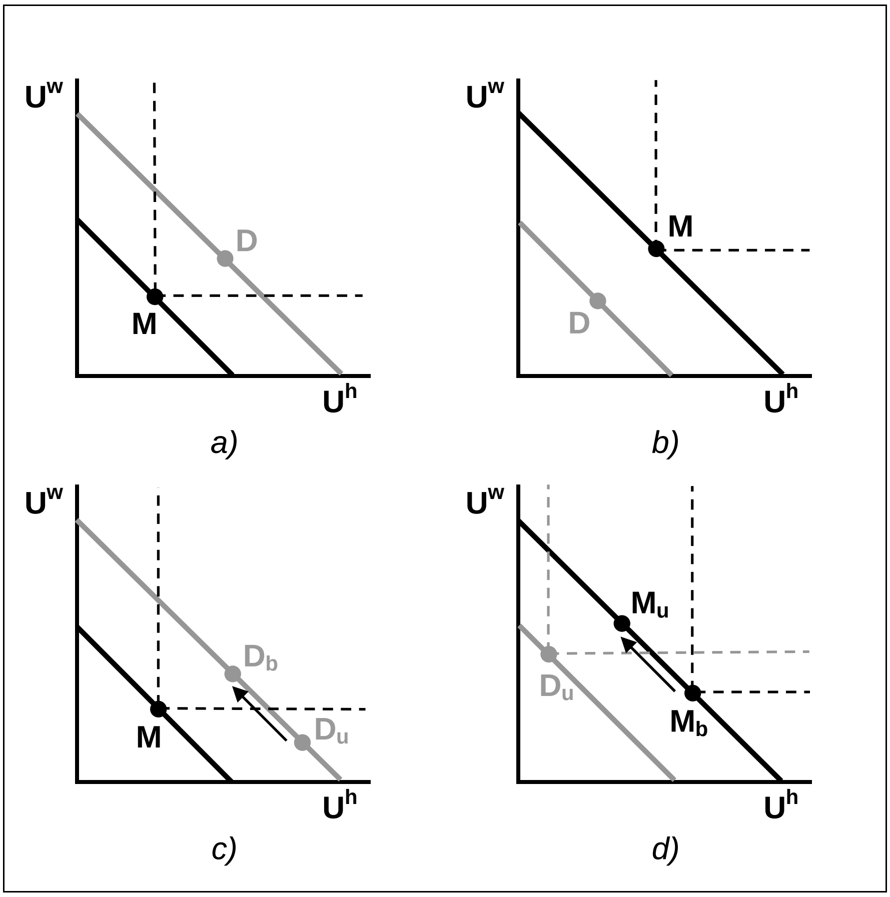

Figure 2: Bargaining over Divorce – Different Scenarios

Empirical evidence on the effect of divorce law and divorce rate is mixed. But while Peters (1986) found that there was no effect, most of the more recent studies agree that there is one (see Allen 2002 as an overview; c.f. Friedberg 1998; Nakonezny, Shull und Rodgers 1995). Those studies include that of Parkman (Parkman 1992) who finds a divorce law effect with the same data that Peters used, showing that her results depended on a misclassification of data. They also include an innovative paper of González and Viitanen (2006) as one of the few studies that do not use US data.

Bargaining Within Marriage

Engaging in market labor or getting children, respectively, touches upon the question of allocating resources in marriage. Different bargaining models with different predicted outcomes have been suggested: Becker's "common preference" model, cooperative games with either divorce or "separate spheres" as the threat point, and non-cooperative games.

A model of common preference is only reasonably applicable if either divorce is (almost) impossible, or the divorce settlement regime is efficient (Landes 1978). It has therefore been criticized by Manser and Brown (1980) and McElroy and Horney (1981) who suggested a cooperative game-theoretic model with individual utility functions of the spouses and divorce as the threat point. Regardless of the bargaining rule that is further applied, the allocation of resources then is Pareto-optimal.

A modification to the cooperative game approach has been proposed by Lundberg and Pollak (1993) who model the threat point as a non-cooperative equilibrium within marriage. This so-called "separate spheres" threat point is characterized by voluntary contributions to household public goods by the spouses. The realization of the threat point leaves a possibility to perpetuate marriage even when resource allocations are inefficient.

In a non-cooperative approach, there are no costlessly enforceable agreements, so they have to be self-enforcing to be binding. Since non-cooperative games typically have more than one single equilibrium, conventional modes of behavior may serve as focal points to determine the outcome of the game. Lundberg and Pollak (1994) suggest that gender roles could help in solving the problem of multiple equilibria in the case of marriages.

Bargaining over children and the wife's labor supply

The questions of how many children to get and how much time to devote on rearing them or how much time to invest in the labor market can be answered in the common preference model. However, in this framework, it is usually not the issue how the overall time devoted to market or household tasks, respectively, is divided between the spouses. If a spouse has comparative advantages in the labor market (i.e. higher earning capacities), he or she will supply labor up to the optimal family supply. Only if this is not feasible for one partner alone, the other will step in. Assuming that the comparative advantages in the labor market have usually been with the husbands, an upward shift in wives' labor supply could be explained by a rise in real wages (Smith und Ward 1985). However, after 1970 real wages started to flatten, while the female labor supply still expanded.

From a cooperative bargaining perspective, it is also relevant who contributes and not only how much of a resource is allocated. Although family specific investments, like those in children, may generally be profitable, individually contributing to this investment is risky in the light of a possibly divorce. The dilemma is that investing in household production usually is at the expense of market labor. This involves not only present but also future shadow costs of household production in terms of lower prospective earning capacities due to a depreciation of marketable human capital. As a result this endogenously leads to the said spouse being individually worse off in terms of a lowering of his or her (divorce-)threat point, whereas the spouse in the labor market accumulates human capital which results in an upward shift of the threat point.

The Impact of Divorce Regime and Divorce Probability

Given these endogenous processes, a bilateral divorce regime, as compared to a unilateral, should then facilitate household production within marriage, where the wife can rather invest in childcare and other household productivity skills, because her husband cannot unilaterally divorce her. That is because a bilateral regime enforces compensations for possible foregone investments in the labor market in the case of divorce. Under unilateral divorce, however, wives should more likely invest in skills that have returns outside the marriage, specifically in the labor market. This hypothesis is supported by the studies of Peters (1986) and Parkman (1992) who find similar effects for the divorce law.

For married women there is a trade off between the hypothetical "insurance" value of investing in marketable human capital and the utility-surplus that can be achieved by household production. Assuming that actors maximize their expected utilities it follows that a rise in the exogenous probability of divorce leads to an expansion of the wife's labor supply, whereas sinking probabilities lead to an expansion of household production. Specifically, this should only be true under unilateral divorce, because the probability of being left uncompensated is zero under bilateral divorce, as stated above.

The effect of the probability to divorce was recently investigated by Iversen and colleagues (2005). They find a positive effect on women's labor status. However, they use problematic measures of divorce probabilities, an issue that we will address below by introducing a more adequate operationalization.

Hypotheses

Taking a bargaining perspective and, specifically, assuming imperfect transferability of marital assets we can now summarize our derived hypotheses that are to be tested in this paper.

H1. Changing divorce regimes in Europe have had an impact on divorce rates.

H2a. Changing divorce regimes have contributed to the rise of female labor force participation in Europe.

H2b. A rise in divorce probabilities can account for a part of the rise of female labor force participation.

H2c. This is particularly true for unilateral divorce regimes.

H3. Changing divorce regimes have contributed to the decline of fertility in Europe.

H3b. A rise in divorce probabilities can account for a part of the decline of fertility.

H3c. This is particularly true for unilateral divorce regimes.

Data and Methods

Data

For the empirical investigation of the hypotheses presented above we use longitudinal aggregate level data, as well as individual level survey data. For the macro level analyses we consider 18 European countries, namely Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom. The data cover a time span of 45 years, ranging from 1960 to 2005. Variables are derived from different sources, predominantly from Eurostat. For France, data from Rothenbacher's (2005) data collection were used as supplement.

The micro data we use in the second part of the empirical section come from a German survey carried out in 1996, titled "Determinants of Divorce". It contains information about married and dissolved couples from the perspective of one spouse but with proxy information on the other. Note that this implies that wives, who are the units of our analyses, can either be respondents or respondents' (former) spouses. In that case husbands were informants on features of their wives. The research design of the survey is cross-sectional, but it contains retrospectively measured survival time data on all relevant variables (work and family biography).

Analytic Strategy

On the macro level, we use time-series models to analyze the causal relation between divorce regimes and divorce rates, and effects of divorce rates and regimes on female labor force participation rates and total fertility rates, respectively. We apply fixed-effect regression models, controlling for country-specific time-trends to rule out the possibility of spurious findings due to a simultaneous variation of variables of time.[2]

The micro data is organized in spell data structure with wives nested in time. In the first micro models, we treat it as quasi dyadic, quasi longitudinal data and run pooled logistic regression models with adjusted standard errors on female labor force participation. Here, we do not focus on within-comparisons but ask more generally whether wives who have higher divorce risks are more likely to invest in market relevant human capital and therefore participate in the labor force. In the last empirical section, when analyzing divorce risk effects on fertility, we treat it as survival time data and calculate proportional hazards models on the transition to the first child (i.e. the family formation).

[2] It can be argued that fixed effects models become very sensitive to the violation of some underlying assumptions when N is small and T is larger, as it is the case here. In such a case the first difference estimation would be more appropriate. On the other hand, FE is less sensitive to violation of the strict exogeneity assumption, especially with large T (Wooldridge 2003: 468). As endogeneity might be a problem in our analyses we prefer FE over FD. Furthermore, as we do neither expect an immediate reaction to institutional changes, nor similar time lags in different countries, FD seems to be an inadequate approach for our research question.

Variables

In the macro level models we present, we use the following measures as dependent variables:

Crude Divorce Rate (CDR), calculated on the basis of the number of divorces per 1000 in the population.

Female Labor Force Participation Rate (FLFPR), operationalized as the ratio of female labor force and total labor force.

Total Fertility Rate (TFR), or the average number of children that would be born to a woman over her lifetime if she were to experience the exact current age-specific fertility rates through her lifetime.

As explanatory variables we rely on the coding of divorce regimes for 18 Countries used by González & Viitanen (2006), originally derived from Boele-Woelki et al. (2003; 2004), Dutoit et al. (2000) and Smith (2002). Only de facto divorce law changes are taken into account.[3] A dummy variable indicates whether the de facto divorce law regime is bilateral divorce (0) or unilateral divorce (1).

We are aware of the possible impact of divorce rates on divorce law changes and that there is likely a problem with endogeneity. The cultural environment in 1960 regarding divorce was probably different than in 2000, for example, when Switzerland revised its divorce laws. The climate preceding regime changes in a country may be influenced by what Whitehead (1997) called “The Divorce Culture.” Therefore, we include the share of European countries with unilateral divorce law as control variable, measuring the “European divorce culture” for each year (c.f. Allen 2002).

Further control variables include country specific time trends in linear, quadratic and cubic form. The cubic form is chosen to fit the S-shaped form that can be observed empirically and that is theoretically plausible as well, when the process is seen as one of innovation diffusion. Note, however, that these variables have no explanatory meaning. That is why we only report F-tests instead of the usual coefficients. Note also that this procedure necessarily leads to an inflated R^2.

For the pooled logistic regression model on female labor force participation, we use *transitions of the wife into paid work* as dependent variable, although transitions to alternative job statuses lead to almost identical results.[4] As transitions at time t can only occur if the wife was employed at t-1 we restrict our models to spells where the lagged dependent variable is 0. We would have liked to analyze transitions in both directions but unfortunately there are too few observed in the data at hand.

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[3] González et al. distinguish between fault law, no-fault law, de facto unilateral law and unilateral law. We concentrate on contrasting de facto bilateral and de facto unilateral regimes, because this captures the legal practice. This is not least for matters of brevity as our focus is on interaction effects. Interpreting the results presented in González et al. it has to be kept in mind that de-facto-unilateral countries are only those who are NOT de jure unilateral as well. Besides, models we have calculated with all variables confirm that the one we actually use is in fact the relevant variable.

[4] See appendix for the full regression models on transitions to part-time and full-time work.

Analyzing the impact of divorce probability and divorce rate on fertility we focus on the *transition to the first child* (i.e. the formation of a family). The time in risk starts with the year of marriage and ends, if not censored, with the birth of the first child.

As explanatory variables on the micro level we use:

the *change of the divorce regime* from bilateral to unilateral, which in Germany was the case, in 1977 with all petitions for divorce filed in and after 1977 being processed on the basis of unilateral divorce law. Consequently this variable is coded 0 in all spells before 1977 and 1 in those after 1977.

Divorce probabilities are implemented in two alternative ways. First, we “import” the Crude Divorce Rate for Germany and use this macro variable as proxy for the divorce probability in a given year. This rate tends to increase over calendar time. This measure is the same for all couples at a given point in time, no matter how long their marriage has been going on. It neither differs between individuals. But since we know that the risk of divorce is also dependent on the duration of marriage, we introduce a second variable measuring divorce probabilities on a more individual level: a hazard prediction of individual divorce risks at differing points in time. This predicted divorce risk is one of the key concepts we use as explanatory variable. The risk of divorce is estimated out of the same micro data we use for the latter analyses. Independent variables used for this prediction include the year of marriage and dummy variables indicating whether a cohabitation with an other partner has been resolved before, whether the contemporary marriage is a remarriage for at least one of the spouses, and whether the marriage was implemented as a church wedding (religious vs. civil marriage). With this strategy our measure also varies between different types of individuals who are known to differ in their divorce risks. On the other hand, we explicitly avoid education, labor market performance and fertility decisions as predictors to derive a measure that is as exogenous as possible.[5]

Approximating the time-changing and interindividually distinct divorce risk simply by the divorce rate leads to an error that is demonstrated in figure 3, where median divorce risks of marriage cohorts 1960-1970 and 1980-1990 are depicted. When younger marriages still exhibit increasing risks, older marriages are already getting more stable despite still rising divorce rates.

As control variables on the micro level we further use a dummy variable indicating whether the wife has a *higher secondary education certificate* and a dummy variable whether she has a completed *vocational education*, i.e. whether she holds a degree from vocational training and/or university. The same two variables are available for the husband and likewise taken into consideration. These measures are supposed to control for earning capabilities which are theoretically important in predicting labor supply.

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[5] Note that the selected variables explain only little of the actual variation in divorces (Pseudo R^2 =.021). This is a general problem in the field of divorce research. However the estimation we use is clearly better than the single indicator solution proposed by Iversen and collegues (2005) which explains an even smaller fraction of the divorce risk (Pseudo R^2 < .004 in our data).

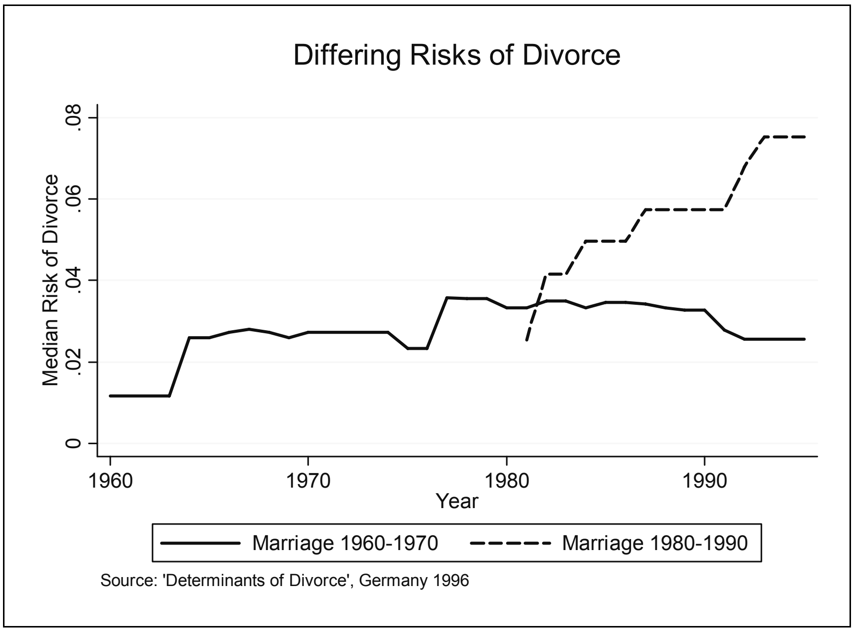

Figure 3: Median Risks of Divorce for Different Marriage Cohorts

In order to make sure that the effects we show below are not only spurious correlations, we control for *children of different ages* in the household and include two dummy variables (children aged 0-6 and 7-18 years, respectively) when we use female labor force participation as dependent variable. Likewise, we control for *female labor supply* when fertility models are applied.

Results

Analyses with Aggregate Level Data

The five regression models in table 1 refer to our first hypothesis (H 1) and analyze the influence of unilateral divorce law (de facto) on divorce probabilities. This question can only be answered using cross-national data with variation in the date of divorce regime changes. Here we use time series models to address this question. The positive and highly significant coefficient of unilateral divorce in model 1 gives evidence that the crude divorce rate is lower under bilateral divorce law and increases as the divorce regime changes. About 50% of the within-country variation can be explained with this single variable. Because countless other changes occurring in the same period – for example in the labor market, in educational systems or even in the age composition of a given population – could be responsible for an increase in divorce rates as well, we should control for them. But since such time series data at country level is not available, at least not for the time when changes in the divorce regime took place, we introduce 18 country specific time trends, each in linear, quadratic and cubic form (models 2-4). "Explaining" now more than 90% ob the within-country variation, the divorce law change from bilateral to unilateral remains a significant predictor. Including a variable measuring the

European divorce climate (as the percentage of countries which already switched to unilateral divorce law), the divorce regime variable loses some of its influence but is still highly significant. A divorce regime coefficient of 0.19 can then be interpreted as follows: For the countries with divorce regime changes between 1960 und 2000, the mean crude divorce rate was 0.63 in 1960 and 2.14 in 2000. Changes in the divorce regimes can account for about 12.5% of this increase, even when country specific time trends and possible effects of a European “divorce culture” are controlled.

Interestingly, the effect of the divorce climate seems to outweigh the effect of the divorce regime change in a particular country. It can be stated that some of the increase in divorce rates in European countries which have established unilateral divorce regimes is due to this said adoption. However, the greater part of the divorce regime effect actually seems to be an effect of “divorce culture”. Divorce rates would have risen anyway in a given country because of the legal changes that have taken place in its (European) environment. It would have risen much less though, if unilateral divorce regimes had never been implemented anywhere else.

Furthermore, while one would expect sudden saltuses in divorce rates following changes in divorce regimes – be it to no-fault law, de facto or de jure unilateral divorce regulations – the idea of a divorce culture better fits the empirical finding of more gradual changes. From this perspective it is also plausible that there are little changes in European divorce rates in the sixties as there are no changes in divorce regimes in this period. In the seventies, however, where several countries adopted new regimes, there is a virtual “take off” in European divorce rates, even in countries that are not directly concerned.

Table 1: FE Models on Divorce Rates

	Crude Divorce Rate				
	Model 1	Model 2	Model 3	Model 4	Model 5
Unilateral Divorce	0.999*** *(0.036)*	0.404*** *(0.036)*	0.405*** *(0.031)*	0.447*** *(0.032)*	0.190*** *(0.036)*
% Unilateral Regimes					1.026*** *(0.083)*
Country Trends		Prob>F=0.00	Prob>F=0.00	Prob>F=0.00	Prob>F=0.00
(Country Trends)^2			Prob>F=0.00	Prob>F=0.00	Prob>F=0.00
(Country Trends)^3				Prob>F=0.00	Prob>F=0.00
Intercept	0.907*** *(0.036)*	0.610*** *(0.019)*	0.433*** *(0.021)*	0.431*** *(0.028)*	0.378*** *(0.026)*
$N_{Clusters}$	18	18	18	18	18
N_{Spells}	794	794	794	794	794
R^2 (within)	0.501	0.808	0.896	0.907	0.924

*** $p<0.001$; ** $p<0.01$; * $p<0.05$; $^+$ $p<0.1$; two tailed

Note: standard errors in parentheses

We have shown, in a very similar way as, for instance, Gonzales and Viitanen (2006), that divorce probabilities depend on divorce laws (H1). In fact, they even depend on divorce practices in other countries. But do divorce regimes and divorce probabilities have an impact on the wives' decision to invest in the labor market (H2a-2c) rather than in children and household productivity skills (H3a-3c)? We next apply fixed effects regression models to examine possible effects on female labor force participation rates (models 6-10) and total fertility rates (models 11-15)[6].

Even when controlling for country specific time trends unilateral divorce regimes lead to higher female labor force participation rates (H2a). And higher divorce rates facilitate wives' engagement in the labor market (H2b). But, according to H2c, we would expect that the impact of divorce probabilities on female labor supply is higher under unilateral divorce law. The negative effect of the interaction term suggests the opposite, though. Using data on country level, we would have to conclude that female labor force participation rates rise with increasing divorce risks, but especially if the divorce regime is bilateral.

Table 2: FE Models on Female Labor Force Participation Rates

	Female Labor Force Participation				
	Model 6	Model 7	Model 8	Model 9	Model 10
Unilateral Divorce	0.078***	0.011**	0.051***	0.012***	0.016***
	(0.004)	*(0.004)*	*(0.007)*	*(0.002)*	*(0.004)*
Crude Divorce Rate		0.065***	0.088***		0.019***
		(0.003)	*(0.004)*		*(0.003)*
Unilateral Divorce ×CDR			-0.033***		-0.007**
			(0.004)		*(0.003)*
Country Trends				Prob>F=0.00	Prob>F=0.00
(Country Trends)^2				Prob>F=0.00	Prob>F=0.00
(Country Trends)^3				Prob>F=0.00	Prob>F=0.00
Intercept	0.337***	0.280***	0.260***	0.321***	0.276***
	(0.003)	*(0.053)*	*(0.004)*	*(0.050)*	*(0.053)*
$N_{Clusters}$	18	18	18	18	18
N_{Spells}	724	690	690	724	690
R^2 (within)	0.352	0.627	0.658	0.964	0.965

*** p<0.001; ** p<0.01; * p<0.05; + p<0.1; two tailed

[6] We have decided not to keep the number of spells constant over the models in order to use all information available for the causal estimation. Note that the reduction in the number of spells in tables 2 and 3 is due to missing data on divorce rates in France and Ireland for longer periods.

Turning to fertility rates as dependent variable, the results are almost identical, yet, of course, with switched signs. Fertility tends to be lower under unilateral divorce law (H3a), and high divorce rates lead to a lowering of fertility rates (H3b). The hypotheses on the interaction between divorce regime and divorce probability (H3c) however states that higher divorce rates should lower fertility rates especially in the case of a unilateral divorce regime. The empirical findings contradict the theory since the coefficient of the interaction variable is rather positive, though not significant in the full model (table 3, model 15).

Table 3: FE Models on Total Fertility Rates

	Total Fertility Rate				
	Model 11	Model 12	Model 13	Model 14	Model 15
Unilateral Divorce	-0.821***	-0.333***	-1.059***	-0.418***	-0.454***
	(0.034)	*(0.038)*	*(0.051)*	*(0.026)*	*(0 .055)*
Crude Divorce Rate		-0.488***	-0.909***		-0.436***
		(0.027)	*(0.032)*		*(0.040)*
Unilateral Divorce ×CDR			0.611***		0.138
			(0.033)		(0.037)
Country Trends				Prob>F=0.00	Prob>F=0.00
(Country Trends)^2				Prob>F=0.00	Prob>F=0.00
(Country Trends)^3				Prob>F=0.000	Prob>F=0.000
Intercept	2.448***	2.892***	3.253***	3.019***	3.205***
	(0.023)	*(0.031)*	*(0.032)*	*(0.022)*	*(0.029)*
$N_{Clusters}$	18	18	18	18	18
N_{Spells}	819	794	794	819	794
R^2 (within)	0.426	0.620	0.736	0.920	0.930

*** p<0.001; ** p<0.01; * p<0.05; $^+$ p<0.1; two tailed

Analyses with Micro Level Data

For the rest of the empirical section, we present regression models based on individual data to illuminate the micro mechanisms which are necessarily kept in the dark when macro models are applied. By focusing on transitions to work by individual married women we can rule out the possibility that the found effects are only due to some compositional shifts of whatever kind in the population. Models 16-20 (table 4) replicate the macro analyses on female labor force participation with individual divorce probabilities approximated by the German divorce rate whereas models 21-25 (table 5) present the same analyses replacing the probability variable by predicted divorce risks.

Table 4: Pooled Logit Regression Models on Transitions to Paid Work

	Δ Paid Work/Wife				
	Model 16	Model 17	Model 18	Model 19	Model 20
Crude Divorce Rate	0.389*** *(0.076)*	0.360*** *(0.085)*	0.134 *(0.100)*	0.352* *(0.168)*	0.404* *(0.186)*
Unilateral Divorce			0.363*** *(0.093)*	0.877** *(0.335)*	0.977** *(0.373)*
Divorce Rate × Unilateral				-0.324 *(0.204)*	-0.406^{+} *(0.227)*
Hi. Sec. Educ./Wife		0.505*** *(0.145)*			0.491*** *(0.144)*
Voc. Educ./Wife		0.775*** *(0.101)*			0.762*** *(0.101)*
Hi. Sec. Educ./Husband		-0.281* *(0.133)*			-0.282* *(0.133)*
Voc. Educ./Husband		-0.078 *(0.109)*			-0.090 *(0.109)*
Children ≤ 6		0.181* *(0.088)*			0.221* *(0.089)*
Children 7-18		-0.260** *(0.086)*			-0.261** *(0.086)*
Intercept	-3.646*** *(0.141)*	-4.070*** *(0.198)*	-3.418*** *(0.150)*	-3.725*** *(0.245)*	-4.250*** *(0.297)*
$N_{Clusters}$	1,505	1,305	1,505	1,505	1,305
N_{Spells}	16,164	14,027	16,164	16,164	14,027
χ^2	26.38	123.74	41.98	42.67	133.60
Pseudo R^2	0.004	0.027	0.006	0.006	0.029

*** p<0.001; ** p<0.01; * p<0.05; $^{+}$ p<0.1; two tailed

Note: Coefficients are logit effects (β); standard errors in parentheses

Overall, table 4 pretty much reflects the results attained with the macro models above (table 2). The found negative interaction effect that contradicts our hypothesis H2c still occurs. The effects of the control variables by and large are in accordance with the theoretical assumptions. The only puzzling effect is that of young children which we would have expected to be negative.

Table 5: Pooled Logit Regression Models on Transitions to Paid Work

	Δ Paid Work/Wife				
	Model 21	Model 22	Model 23	Model 24	Model 25
Risk of Divorce	1.632***	1.909***	1.480***	-0.466	-0.255
	(0.372)	*(0.414)*	*(0.383)*	*(0.963)*	*(0.946)*
Unilateral Divorce			0.369***	0.241*	0.177
			(0.096)	*(0.110)*	*(0.121)*
Divorce Risk × Unilateral				2.413*	2.498*
				(1.061)	*(1.072)*
Hi. Sec. Educ./Wife		0.426*			0.400*
		(0.180)			*(0.181)*
Voc. Educ./Wife		0.864***			0.826***
		(0.128)			*(0.129)*
Hi. Sec. Educ./Husband		-0.230			-0.239
		(0.166)			*(0.167)*
Voc. Educ./Husband		0.151			0.123
		(0.147)			*(0.148)*
Children ≤ 6		-0.079			-0.038
		(0.105)			*(0.107)*
Children 7-18		-0.352**			-0.363**
		(0.116)			*(0.116)*
Intercept	-2.896***	-3.506***	-3.121***	-3.029***	-3.561***
	(0.055)	*(0.182)*	*(0.086)*	*(0.092)*	*(0.190)*
$N_{Clusters}$	1,349	1,177	1,349	1,349	1,177
N_{Spells}	8,291	7,203	8,291	8,291	7,203
χ^2	19.22	82.38	29.92	35.51	90.72
Pseudo R^2	0.003	0.028	0.007	0.008	0.032

*** p<0.001; ** p<0.01; * p<0.05; $^+$ p<0.1; two tailed

Running the same models with another measure of divorce probability leads to very different effects with respect to that variable and the corresponding interaction effect (table 5). In contrast to the corresponding models above (tables 2 and 4), the findings fully confirm our hypotheses. As models 24 and 25 show, there is virtually no effect of the divorce risk on the transition to work under a bilateral divorce regime, whereas the effect is positive if divorce can unilaterally be achieved.

The conditional effects of the probability to divorce are shown below in figure 4 and reflect the results depicted in table 5, model 24. As can be seen, the divorce regime has little impact on female labor force transitions if the divorce risk is minimal (~ factor 1.2). Under conditions of an extremely high divorce risk, however, transitions are much more likely in case of a unilateral divorce regime (~ factor 12).

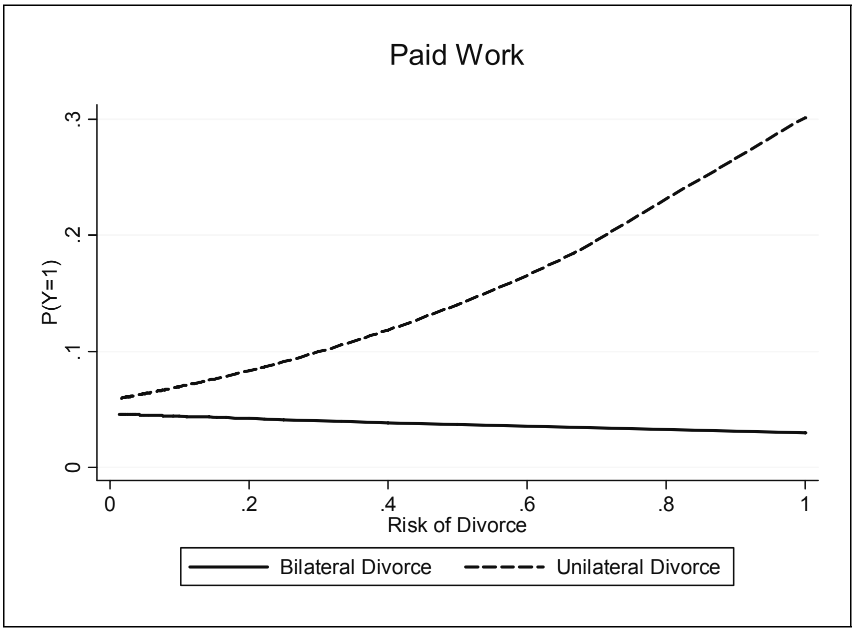

Figure 4: Divorce Regime, Divorce Risk and the Transition to Work

Summarizing the effects of divorce risk on female labor force participation we can conclude that an adequate operationalization of the risk variable is crucial. If an indicator is used that is allowed to vary between couples, with calendar time and over the course of marriage we obtain the results we hypothesized. This also applies for analyses on different transitions (into part-time employment or full-time employment, respectively) as it is reported in the appendix.

Models 26-33 are the corresponding micro analyses to the time series models on the fertility rates presented above (table 3). Analogous to the models on female labor force participation divorce probabilities are operationalized as divorce rates (table 6) or predicted divorce risks (table 7), respectively.

Table 6: Cox Regression Models on Transitions to the first Child

	Transition to 1. Child			
	Model 26	Model 27	Model 28	Model 29
Crude Divorce Rate	1.085 *(0.056)*	1.120 *(0.087)*	1.116 *(0.094)*	1.156⁺ *(0.098)*
Unilateral Divorce		1.040 *(0.195)*	1.005 *(0.200)*	1.080 *(0.214)*
Divorce Rate × Unilateral		0.966 *(0.109)*	0.981 *(0.117)*	0.942 *(0.112)*
Hi. Sec. Educ./Wife			0.914 *(0.085)*	0.900 *(0.083)*
Voc. Educ./Wife			1.117 *(0.079)*	1.147⁺ *(0.084)*
Hi. Sec. Educ./Husband			1.167 *(0.085)*	1.153⁺ *(0.084)*
Voc. Educ./Husband			1.236 *(0.107)*	1.216* *(0.106)*
Full-Time Job/Wife				0.819** *(0.058)*
Part-Time Job/Wife				1.137 *(0.104)*
Paid Work/Wife				1.162 *(0.272)*
$N_{Clusters}$	1248	1248	1079	1079
N_{Spells}	10465	10465	8809	8809
χ^2	2.50	4.64	19.19	38.91
Pseudo R^2	0.000	0.000	0.001	0.002

*** p<0.001; ** p<0.01; * p<0.05; ⁺ p<0.1; two tailed

Note: Coefficients are transition rates (e^{β}); standard errors in parentheses

In the models containing the divorce rate variable, there are hardly any effects apart from those of the controls (table 6). For those models with the divorce risk variable our hypotheses again are strongly confirmed (table 7). Specifically, divorce risk has a negative impact on the transition to the first child (model 30) which is particularly true under a unilateral divorce regime. However, we find that the divorce risk is not completely irrelevant under bilateral divorce either. These findings remain stable when the wife's employment status is also controlled (model 33).

Table 7: Cox Regression Models on Transitions to the first Child[7]

	Transition to 1. Child			
	Model 30	Model 31	Model 32	Model 33
Risk of Divorce	0.111***	0.446	0.623	0.672
	(0.056)	*(0.249)*	*(0.292)*	*(0.316)*
Unilateral Divorce		1.500***	1.462***	1.474***
		(0.106)	*(0.105)*	*(0.106)*
Divorce Risk × Unilateral		0.048***	0.038***	0.038***
		(0.042)	*(0.032)*	*(0.033)*
Hi. Sec. Educ./Wife			0.960	0.950
			(0.085)	*(0.085)*
Voc. Educ./Wife			1.114	1.157*
			(0.081)	*(0.086)*
Hi. Sec. Educ./Husband			1.184*	1.154^{+}
			(0.087)	*(0.087)*
Voc. Educ./Husband			1.250*	1.224*
			(0.112)	*(0.110)*
Full-Time Job/Wife				0.798**
				(0.056)
Part-Time Job/Wife				1.119
				(0.100)
Paid Work/Wife				1.286
				(0.244)
$N_{Clusters}$	1117	1117	966	966
N_{Spells}	6188	6188	5291	5291
χ^2	19.29	49.06	60.89	85.82
Pseudo R^2	0.001	0.003	0.004	0.005

*** p<0.001; ** p<0.01; * p<0.05; $^{+}$ p<0.1; two tailed

The conditional effects of the probability to divorce on fertility are shown in figure 5 and reflect the results depicted in table 7, model 31. The divorce regime has a significant impact on the transition to the first child if the divorce risk is minimal (~ factor 1.5). However, the risk of getting a child, then, is higher in the unilateral regime. If divorce risk is very high on the contrary, transitions are much less likely in case of a unilateral divorce regime (~ factor 21), just as we predicted.

[7] One problem with the results presented in table 7 is a violation of the proportional hazard assumption (χ^2(10)=47.44; P>χ^2=0.00 in Model 33. Nevertheless, we are confident in our general findings since they are confirmed by separate analyses (unilateral vs. bilateral divorce regime). Under bilateral law we find a divorce-risk effect of e^{β}=.677 that is not significant (z=-.92) while under unilateral law the effect is e^{β}=.026 (z=-4.81). A violation of the proportional hazard assumption can be rejected in the separated models.

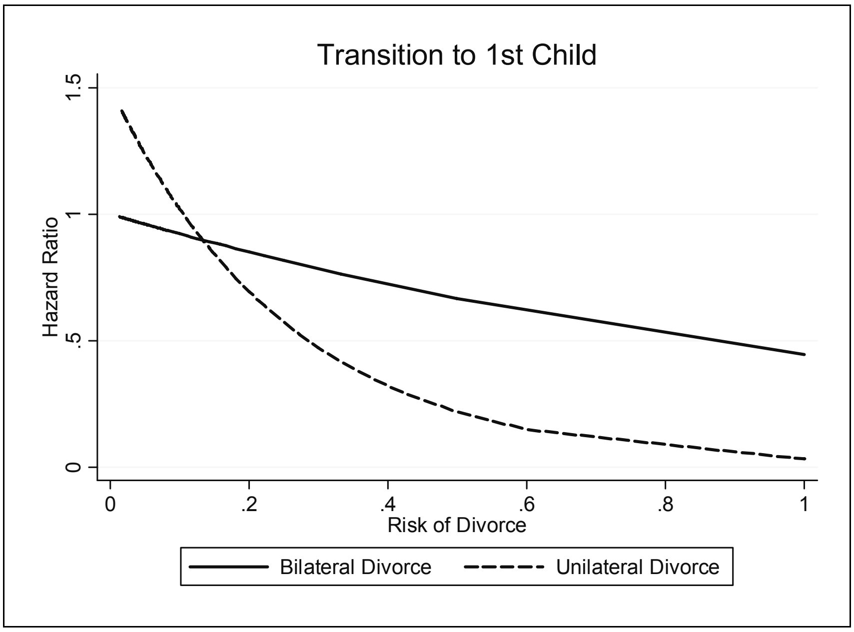

Figure 5: Divorce Regime, Divorce Risk and Fertility

Discussion

In this paper we tried to show how changing divorce regimes have influenced divorce risks in Europe, how divorce probabilities have affected female labor force participation and fertility, and how these effects are mediated by divorce regimes. At first, in accordance with most recent work on that issue, we find that changing to a unilateral divorce regime has an impact on divorce rates. Our results go beyond previous findings inasmuch as we can show that the effect of divorce regime changes remains after controlling for the possibility of a spurious correlation due to some "divorce culture" that might simultaneously induce regime changes and variations in divorce rates. However the effect of a common divorce culture seems to be more important than the sheer shifts in legal practices in one specific country. We therefore would not expect divorce rates to decrease considerably if countries single-handedly try to switch back to mutual consent laws.

Secondly, we are able to identify the hypothesized interaction of divorce regime and divorce probability when investigating transitions in women's labor status and family formation. However, what is crucial here is an adequate operationalization of the divorce probability which in principle should vary interindividually, over historical time, and over the marriage course. Proxy variables which do not take account of these features are therefore a misspecification of the underlying construct and might lead to mistakable results.

Referring to the models that we argue are the ones best specified, we then can conclude that all hypotheses posited above can be accepted. Nevertheless, the insights given in this paper can merely be seen as pieces in a larger puzzle. In any case it has not been our primary goal to explain as much of the variation in female labor force participation and fertility as possible, and we are aware that there are many more variables that influence these processes. And, evidently, there remain possible problems of endogeneity in all models.

Finally, we conclude that gaining further insights into the interrelations we tried to sketch here and to really generalize our findings on a European level, international survey data should be used.

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Appendix:

Table A1: Pooled Logit Regression Models on Transitions to Full-Time Work

	Δ Full Time Job/Wife				
	Model A1	Model A2	Model A3	Model A4	Model A5
Crude Divorce Rate	0.219**	0.167⁺	0.091	0.312⁺	0.347⁺
	(0.081)	*(0.090)*	*(0.106)*	*(0.173)*	*(0.191)*
Unilateral Divorce			0.183⁺	0.719*	0.782*
			(0.099)	*(0.354)*	*(0.393)*
Divorce Rate × Unilateral				-0.335	-0.408⁺
				(0.213)	*(0.236)*
Hi. Sec. Educ./Wife		0.398*			0.389*
		(0.155)			*(0.155)*
Voc. Educ./Wife		0.856***			0.848***
		(0.107)			*(0.107)*
Hi. Sec. Educ./Husband		-0.184			-0.181
		(0.144)			*(0.144)*
Voc. Educ./Husband		-0.156			-0.161
		(0.111)			*(0.111)*
Children ≤ 6		0.171⁺			0.195*
		(0.091)			*(0.093)*
Children 7-18		-0.408***			-0.416***
		(0.091)			*(0.092)*
Intercept	-3.790***	-4.125***	-3.677***	-3.989***	-4.425***
	(0.149)	*(0.215)*	*(0.159)*	*(0.255)*	*(0.312)*
$N_{Clusters}$	1,848	1,613	1,848	1,848	1,613
N_{Spells}	21,959	19,125	21,959	21,959	19,125
χ^2	7.40	122.89	10.78	12.68	125.57
Pseudo R^2	0.001	0.027	0.002	0.002	0.027

*** p<0.001; ** p<0.01; * p<0.05; ⁺ p<0.1; two tailed

Table A2: Pooled Logit Regression Models on Transitions to Full-Time Work

	Δ Full Time Job/Wife				
	Model A6	Model A7	Model A8	Model A9	Model A10
Risk of Divorce	1.50***	1.663***	1.440***	-0.041	-0.257
	(0.366)	*(0.422)*	*(0.372)*	*(0.802)*	*(1.002)*
Unilateral Divorce			0.148	0.046	-0.045
			(0.102)	*(0.113)*	*(0.128)*
Divorce Risk × Unilateral				1.850*	2.275*
				(0.906))	*(1.098)*
Hi. Sec. Educ./Wife		0.178			0.170
		(0.201)			*(0.202)*
Voc. Educ./Wife		1.022***			1.010***
		(0.146)			*(0.146)*
Hi. Sec. Educ./Husband		-0.097			-0.096
		(0.182)			*(0.182)*
Voc. Educ./Husband		0.075			0.069
		(0.154)			*(0.155)*
Children ≤ 6		-0.075			-0.067
		(0.113)			*(0.115)*
Children 7-18		-0.581***			-0.580***
		(0.125)			*(0.126)*
Intercept	-3.336***	-3.952***	-3.428***	-3.355***	-3.899***
	(0.058)	*(0.197)*	*(0.089)*	*(0.093)*	*(0.207)*
$N_{Clusters}$	1,685	1,478	1,685	1,685	1,478
N_{Spells}	11,316	9,865	11,316	11,316	9,865
χ^2	16.76	88.77	17.31	21.34	92.80
Pseudo R^2	0.003	0.033	0.003	0.004	0.034

*** p<0.001; ** p<0.01; * p<0.05; $^+$ p<0.1; two tailed

Table A3: Pooled Logit Regression Models on Transitions to Part-Time Work

	Δ Part Time Job/Wife				
	Model A11	Model A12	Model A13	Model A14	Model A15
Crude Divorce Rate	0.364*** (0.076)	0.330*** (0.085)	0.106 (0.099)	0.323+ (0.167)	0.382* (0.185)
Unilateral Divorce			0.369*** (0.093)	0.877** (0.333)	1.022** (0.371)
Divorce Rate × Unilateral				-0.321 (0.203)	-0.428+ (0.225)
Hi. Sec. Educ./Wife		0.495*** (0.147)			0.479** (0.146)
Voc. Educ./Wife		0.832*** (0.101)			0.820*** (0.101)
Hi. Sec. Educ./Husband		-0.276* (0.135)			-0.277* (0.135)
Voc. Educ./Husband		-0.128 (0.108)			-0.140 (0.108)
Children ≤ 6		0.190* (0.088)			0.232** (0.089)
Children 7-18		-0.291*** (0.086)			-0.293*** (0.087)
Intercept	-3.653*** (0.140)	-4.061*** (0.198)	-3.423*** (0.149)	-3.728*** (0.244)	-4.258*** (0.296)
$N_{Clusters}$	1,544	1,341	1,544	1,544	1,341
N_{Spells}	16,859	14,655	16,859	16,859	14,655
χ^2	23.20	135.24	38.80	39.78	145.45
Pseudo R^2	0.003	0.029	0.005	0.006	0.032

*** p<0.001; ** p<0.01; * p<0.05; + p<0.1; two tailed

Table A4: Pooled Logit Regression Models on Transitions to Part-Time Work

	Δ Part Time Job/Wife				
	Model A16	Model A17	Model A18	Model A19	Model A20
Risk of Divorce	1.585***	1.792***	1.449***	-0.770	-0.550
	(0.355)	*(0.400)*	*(0.364)*	*(1.055)*	*(1.017)*
Unilateral Divorce			0.370***	0.226*	0.175
			(0.097)	*(0.112)*	*(0.123)*
Divorce Risk × Unilateral				2.726*	2.692*
				(1.133)	*(1.117)*
Hi. Sec. Educ./Wife		0.426*			0.395*
		(0.183)			*(0.184)*
Voc. Educ./Wife		0.945***			0.908***
		(0.129)			*(0.131)*
Hi. Sec. Educ./Husband		-0.254			-0.260
		(0.170)			*(0.170)*
Voc. Educ./Husband		0.094			0.068
		(0.146)			*(0.147)*
Children ≤ 6		-0.055			-0.014
		(0.106)			*(0.109)*
Children 7-18		-0.411***			-0.421***
		(0.118)			*(0.119)*
Intercept	-2.951***	-3.562***	-3.178***	-3.072***	-3.618***
	(0.055)	*(0.183)*	*(0.087)*	*(0.095)*	*(0.193)*
$N_{Clusters}$	1,388	1,212	1,388	1,388	1,212
N_{Spells}	8,650	7,516	8,650	8,650	7,516
χ^2	19.98	91.26	30.03	37.65	101.01
Pseudo R^2	0.003	0.032	0.007	0.008	0.046

*** p<0.001; ** p<0.01; * p<0.05; $^+$ p<0.1; two tailed