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Kornelius Kraft Stefanie Neimann

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Kornelius Kraft

TU Dortmund. ZEW and IZA

Stefanie Neimann

TU Dortmund and RGS Econ

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P.O. Box 7240 53072 Bonn Germany

Phone: +49-228-3894-0 Fax: +49-228-3894-180 E-mail: iza@iza.org

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ABSTRACT

Effect of Labor Division between Wife and Husband on the Risk of Divorce: Evidence from German Data*

Using German panel data from 1984 to 2007, we analyze the impact of labor division between husband and wife on the risk of divorce. Gary Becker's theory of marriage predicts that specialization in domestic and market work, respectively, reduces the risk of separation. Traditionally, the breadwinner role is assigned to the husband, however, female labor force participation and their wages have risen substantially. Our results suggest that there are gender-specific differences, e.g. female breadwinner-couples have a substantially higher risk of divorce than male breadwinner-couples. In contrast, the equal division does not significantly alter the probability of separation.

JEL Classification: J12, J22

Keywords: divorce, labor division, Germany

Corresponding author:

Kornelius Kraft TU Dortmund Volkswirtschaftslehre (Wirtschaftspolitik) 44221 Dortmund Germany

E-mail: kornelius.kraft@tu-dortmund.de

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1 Introduction

During the last decades, we could observe a dramatic increase in divorce rates in most developed countries. At the same time, labor force participation of married women rose substantially. The question to what extent these two developments are related has widely been neglected by economists. However, Becker et al. (1977) already suggest a positive relationship between female labor force participation and risk of divorce in their work on marital stability. Their analysis is based on Becker's theory of marriage (Becker, 1973, 1974) that hypothesizes that specialization of the two spouses in housework on the one hand and market work on the other hand constitutes the most important factor to gains from marriage compared to staying single. Therefore, the one with the higher wage earnings capacity should specialize in market work, whereas the other one should specialize in doing housework. Due to their higher gains from marriage, these specialized couples should consequently have a lower risk of divorce than couples where both spouses are employed.

In principle, it should not matter whether the husband or the wife participates in the labor force as long as he or she is able to derive a higher wage income. Nevertheless, the breadwinner role is usually assigned to the husband. One reason is probably that, on average, men still earn more than women. However, despite the high female labor force participation and that egalitarian gender attitudes have become more common today, husbands are also still expected to take on the provider role for his family by many people. Consequently, couples with a husband earning less than the wife are more likely to be frustrated or to be subject to social sanctions that in turn leads to a higher probability of separation. Moreover, while we observe a higher female labor force participation today than in the past, housework is still primarily the wife's domain (see e.g. Bittman et al., 2003; Hersch and Stratton, 1994). If one spouse is exposed to the double burden of domestic and market work, this additional stress and the lack of spouse's support are also very likely to reduce marital stability.

Since the Becker approach implies some strong assumptions, bargaining models have been proposed (e.g. Manser and Brown, 1980; McElroy and Horney, 1981). Usually, the division of household goods is not symmetric

but depends on the two spouses' outside options and the relative bargaining power. Both are largely affected by the individual's income.

Our questions of interest are whether the labor division between wife and husband has any impact on marital stability and in what respect. Is specialization really stability-enhancing? If so, can we observe differences between the traditional specialization "housewife, working husband" and the nontraditional "househusband, working wife"? Does the modern equal division imply a higher risk of separation? Previous empirical analyses by economists and particularly sociologists are usually restricted to the impact of the wife's income relative to the total household income. The first group of studies find a positive relationship between this ratio and the probability of divorce, e.g. Kesselring and Bremmer (2006), Liu and Vikat (2004), or Booth et al. (1984). That is, the higher the wife's income proportion, the higher the risk of separation. A second group of analyses does not find any statistically significant effect. Examples are Sayer and Bianchi (2000), Tzeng and Mare (1995), and Spitze and South (1985). Concerning the behavior of German couples only a few empirical studies exist that are usually limited to the effect of wife's employment status (e.g. Böttcher, 2006, Ott, 1992). Hartmann and Beck (1999) provide a more elaborated evaluation of the relationship between wife's employment and marital stability. They conclude that it also matters whether the wife earns more than the husband, and whether there are conflicts about the division of housework or about time spent together. Stauder (2005) instead concentrates on the effect of the division of market and domestic work after childbirth. He finds that marital stability is only significantly diminished if the wife bears the double burden of market and domestic work.

Using a rich panel data set from the German Socio-Economic Panel (SOEP) from 1984 to 2007, we try to shed new light on these issues. For our analysis of divorce determinants, we use complementary log-log (cloglog) regression models with couple-specific random effects to control for unobserved heterogeneity. Our SOEP-sample consists of West German couples only that are observed from the beginning of their marriage onwards until separation or right-censoring. The analyses focus on the effects of labor division-patterns. Nevertheless, various other factors are also controlled for like the presence of

children of different ages or education that may influence the risk of divorce as well as labor division patterns.

In order to test the effect of specialization, we do not just consider the wife's labor force status. We define the wife's labor income as proportion of total household income on the one hand and her proportion of total time used for housework on the other hand as variables of main interest. As indicator for market work, we use income instead of hours worked because we think that, for our purpose, the economic success is more important than time used. Moreover, it is consistent with Becker's household model.

Our results suggest that the labor division can have an effect on the risk of divorce but specialization per se is not stability-enhancing. We rather find gender-specific differences. Couples with a female main earner and a husband doing most of the housework have a substantially higher probability of separation than couples with the traditional male breadwinner/housewife-pattern. Marital stability is also considerably reduced if the wife has to bear the double burden of market and housework which we cannot find if the husband bears it. In contrast, the equal division does not significantly alter the risk of divorce.

The paper is structured as follows. Section 2 describes the empirical approach and the data we use. In section 3, empirical results are presented. Conclusions are given in section 4.

2 Empirical approach

We estimate the probability of divorce in period t given explanatory variables in t-1 using a complementary log-log model with couple-specific random effect to control for unobserved heterogeneity. However, we deviate from this definition regarding our labor division variables. Labor market behavior can be largely influenced by the subjective probability of divorce (see Johnson and Skinner, 1986). Therefore, we expect a change in working behavior in the preceding years to divorce, in particular by women, if an individual already suspects separation. This would be then a case of reversed causality

¹Results do not differ qualitatively if we use a logit or probit model.

which would bias our estimates. For that reason, we use lagged variables of period t-3 instead of t-1 to circumvent this problem.

The data we use is taken from the West German sample of the SOEP, waves 1984 to 2007.² The advantage of this data is the availability of a rather long time series of 24 periods and numerous control variables.³ We only include couples that marry during the observation period so that we are able to follow a couple from the beginning of the marriage onwards until they separate/get divorced (whichever is stated first) or until observations are right-censored. In the following, we do not distinguish between separation and divorce and use them interchangeably.

Even though it would be very interesting to extend this analysis to both parts of Germany we restrict it to the West for two reasons. First, in the former GDR it was a social norm for women to work even after childbirth. Along with the ideological pressure, a low wage level, strong eligibility requirements for widow's pension, and restricted possibilities to claim alimony from the (former) husband in case of divorce forced women into full-time employment. Public provision of cheap and extensive child care for children of all ages made it possible to work full-time even after childbirth. In contrast, in West Germany, the lack of child care, incentives by the income tax system and stigmatization of working mothers have made it advantageous for wives to stay at home or to work at most part-time. Therefore, it is not reasonable to pool West and East German couples since the differences in female labor force participation and provision of public child care have continued to exist even after reunification. Second, given our strategy to look only at couples that marry during the observation period, the sample of East German couples is too small to get reasonable estimates in separate regressions.

Another sampling problem is the treatment of the unemployed. In our opinion, a specific labor division induced by unemployment of one spouse is a

²The data used in this paper was extracted using the Add-On package PanelWhiz v2.0 Nov. 2007 for Stata. PanelWhiz (http://www.PanelWhiz.eu) was written by Dr. John P. Haisken-DeNew (john@PanelWhiz.eu). See Haisken-DeNew and Hahn (2006) for details. The PanelWhiz generated DO file to retrieve the data used here is available from us upon request. Any data or computational errors in this paper are our own.

³For more information on the SOEP see, e.g., Wagner et al. (2007).

special case. Losing the job is usually an unwanted, negative shock that affects the financial situation of the family as well as self-esteem and self-confidence of the individual concerned (see e.g. Kraft, 2001, Charles and Stephens, 2004). In order to avoid mixing up different effects, we drop those observations in which at least one spouse is unemployed.⁴ Ultimately, the sample consists of 1,128 couples with 8,758 couple-years and 204 divorces and separations. Hence, the observed probability of divorce is 2.33 % per year, and 18.09 % of the couples finally separate. We do not only look at first marriages but remarriages as well: For 34.75 % of the couples, at least one spouse does not marry for the first time.

In order to find the effect of spousal labor division on the risk of divorce we define five labor division-patterns depending on the wife's proportions of total household income and total time used for housework.⁵ Therefore, we first generate the wife's monthly gross labor income (wage plus income from self-employment) as proportion of the household's monthly gross income to measure her economic success relative to the husband's. 6 We think that the financial aspect of labor force participation is in this case more important than hours worked. Moreover, it follows Becker's household production function that defines market goods, financed by wage income, and time use as input factors. As second element of labor division, we generate the wife's proportion of total time used for housework. "Housework" is an aggregate that subsumes time used for housework (in a narrower sense) and shopping, for child care, and for crafts, repairs, and gardening. We prefer the aggregate to the narrow definition of housework since there may be an additional gender-specific specialization within housework chores which is, however, not part of our analysis.

⁴Results are, nevertheless, robust to the inclusion of the unemployed.

⁵With this strategy we follow Stauder (2005) who uses time used for market and domestic work, respectively, to generate five different labor division patterns.

⁶We decide to take the gross instead of the net income because of the special regulations for married couples in the German tax system. If the gross wage income of both spouses differ, the one with the lower income (usually the wife) pays a relatively high tax prepayment compared to his or her spouse since all tax allowances are assigned to the one with the higher income. This reduces the couple's overall sum of tax prepayments. However, it makes a direct comparison of net incomes unfeasible since they suffer from a systematic distortion by the German taxation. For an example, see e.g. Bundesministerium der Finanzen (2008).

In a next step, we define three groups of wife's income and housework proportion, respectively: The wife's proportion makes up 0 to 40 %, 40 to 60 %, or more than 60 %.⁷ Then, we combine them with each other and generate five labor division combinations for our regressions:

- 1. Traditional labor division: wife's housework proportion is larger than her income proportion;
- 2. Non-traditional: wife's income proportion is larger than her housework proportion;
- 3. Equal: wife's and husband's shares are virtually the same;
- 4. Double burden husband: wife's housework and income proportions are both smaller than the husband's;
- 5. Double burden wife: wife's housework and income proportions are both larger than the husband's;

Table 1 illustrates how the nine possible combinations of wife's income and housework proportion are assigned to these five groups.

Table 1: Income and housework combinations

Wife's prop.	Wife's prop. housework			
income	0.00-0.40	0.40-0.60 0.60-1.00		
0.00-0.40	double b. husb.	trad.		
0.40-0.60	non-trad.	equal	trad.	
0.60-1.00	non-trad.		double b. wife	

Table 2 shows the distribution of these combinations in our sample. For 82.06~% of all observations the traditional labor division can be found, whereas the non-traditional and the equal one can only be observed in 6.17~% and 5.71~% of all couple-years, respectively. As expected, there are only

 $^{^7 \}rm Our$ results do not change substantially if we use intervals 35 % to 65 % or 30 % to 70 % instead of 40 and 60 %.

a few observations where one spouse is mainly responsible for both, earning income and doing housework. In 2.69 %, the husband bears the double burden, whereas in 3.37 % the wife does so. The traditional pattern is the reference group in regression (1).

Since the non-working wives constitute such a large group in our sample we subdivide the pattern of traditional labor division. There may be a difference between wives that earn nothing and wives that earn at least some money. Therefore, we differentiate between wives with zero income and a housework proportion larger than $40 \% (Trad \ 1)$, and wives with some income lower than 40 % and a housework proportion at least $40 \% (Trad \ 2)$. $Trad \ 1$ is the reference group in regression (2).

Table 2: Descriptives of labor division variables

Variable	No. of obs.	in %
Traditional	7,187	82.06
of which:		
Trad 1: wife's prop. $= 0 \%$	3,209	36.64
Trad 2: wife's prop. $<$ 40 %	3,978	45.42
Non-traditional	540	6.17
Equal	500	5.71
Double burden husband	236	2.69
Double burden wife	295	3.37
Total no. of observations	8,758	

All variables refer to period t-3.

In addition to the above mentioned labor division variables, we include a set of important variables that are very likely to have an effect on the risk of divorce. However, we will not explain them in more detail. We consider the household's gross income, spouses' educational level, number of children of different ages, spouses' age at marriage, the absolute age difference, a

dummy variable if it is not the first marriage for at least one spouse, a dummy for living in the city center, and marriage duration dummies.⁸

3 Results

Table 3 shows an extract of the coefficients of our random effects-cloglog estimations. Full estimation results are given in appendix B.

Regarding the impact of labor division on the risk of divorce we see that two patterns do positively affect the risk of divorce, whereas the others only have a relatively small and insignificant effect. The most striking result is that couples with a wife bearing the double burden have a substantially higher risk of divorce than couples with a male breadwinner and a housewife. Similarly, if the wife is the main earner and the husband does most of the housework, marital stability is considerably diminished. If both spouses share equally the jobs of earning income and doing housework, the risk of divorce is not substantially affected compared to the traditional labor division. In contrast, if the husband bears the double burden, marital stability is even enhanced, however, the effect is not significant. If we further subdivide the group with a traditional labor division, we find similar results for the first four patterns. The effects are, however, usually stronger. If the wife works but earns less than 40 %, marital stability is not significantly altered compared to if she does not work.

Thus, labor division does matter but specialization per se is not stability-enhancing. We rather find gender-specific differences. On the one hand, specialization has only a stabilizing effect if the traditional labor division between husband and wife is chosen. On the other hand, if the wife bears the double burden the risk of divorce is much higher unlike if the husband

⁸Summary statistics are given in appendix A.

⁹If we assign those couples with wife's income proportion 40 to 60 % and housework 0 to 40 % or 60 to 100 % to the double burden groups, respectively, we still find the destabilizing effect of non-traditional and double burden wife couples. If we separate those of the non-traditional couples and those of the traditional couples who have an income proportion 40 to 60 %, the coefficients for the two non-traditional groups are still positive and weakly significant. The lower significance can probably be attributed to the small number of observations (366 and 174).

does it. Given that about 2/3 of divorces in Germany are initiated by women (see Bundesministerium für Familie, Senioren, Frauen und Jugend (2003)), one could think that financial independence is a necessary precondition for her to do so. Since the effect of "Trad 2" is not significant, her income must probably exceed a certain threshold for financial independence. However, the insignificant result for the equal division contradicts this interpretation. Frustration of one or both spouses that the wife is the main earner and not the husband as traditionally expected seems to be a better explanation for our findings. Moreover, the husband's self-esteem might be adversely affected by her economic success.

Table 3: Coefficients of RE-cloglog-estimations

	(1)	(2)
Equal division, t-3	0.1868	0.3691
	(0.3004)	(0.3335)
Non-trad. division, t-3	0.5525**	0.7277**
	(0.2735)	(0.3082)
Double b. husband, t-3	-0.4541	-0.2607
	(0.5311)	(0.5530)
Double b. wife, t-3	0.7594**	0.9315***
	(0.3235)	(0.3532)
Trad 2, t-3		0.2599
		(0.2009)
Other variables	yes	yes
No. of obs.	8,758	8,758
No. of couples	1,128	1,128
Log-likelihood	-931.823	-930.969

¹⁾ Standard errors in parentheses.

^{2) *:} p<0.10, **: p<0.05, ***: p<0.01.

³⁾ Full estimation results are given in appendix B.

⁴⁾ Reference groups: Traditional lab. div./Trad 1.

4 Conclusions

Using a rich panel data set of German couples, we test the hypothesis that specialization in market work and housework, respectively, increases marital stability. Gary Becker assumes that gains from marriage mainly result from the complementarity of man and woman in the production of home commodities. Therefore, one spouse should specialize in earning money (traditionally the husband), and the other one should specialize in doing housework (traditionally the wife) in order to reduce the risk of divorce. However, it is questionable whether this aspect still (if ever) matters. Nowadays, it is quite common for married women to work in the labor market. Moreover, some families rely on her income, at least temporarily, since job histories of men are increasingly characterized by breaks with spells of unemployment. In addition, only recently, German policy-makers reformed parental leaveregulations in such a way that fathers have an incentive to take a share of the legal parental leave. Thus, the traditional labor division with a working husband and a housewife should be less prevalent and consequently less relevant for marital stability.

Our data set provides rich information for both spouses about e.g. labor force status, income, children, and time used for housework. Hence, we are able to test for the effect of actual labor division on the risk of divorce. We show that it matters who does what. While the equal division does not significantly alter the risk of divorce, couples with a female breadwinner and a househusband have a higher risk of divorce than couples with a male main earner and a housewife. Hence, specialization per se does not enhance marital stability, only the traditional one. Marital stability is also substantially reduced if the wife bears the double burden which we cannot find for husbands. Our results suggest that frustration that the wife is the main earner and not the husband (so that the wife could stay at home) as traditionally expected substantially reduces the gains from marriage.

A Descriptive statistics

Table 4: Descriptive statistics of additional explanatory variables (all couple-years)

couple-years)		
Variable	Mean	Std. Dev.
For at least one spouse not first marriage	0.34	0.47
H: Age at marriage	31.92	7.96
W: Age at marriage	29.24	7.19
Absolute age difference		3.79
Live in city center		0.28
H: High-educated	0.20	0.40
H: Medium-educated	0.72	0.45
H: Low-educated	0.08	0.27
W: High-educated	0.11	0.31
W: Medium-educated	0.76	0.43
W: Low-educated	0.13	0.34
No. of HH members age $0-1$	0.12	0.34
No. of HH members age 2–7	0.64	0.78
No. of HH members age $8-15$	0.45	0.76
HH's gross income in $1{,}000$ Euro of 2000	3.87	2.42
Total no. of observations		8,758

^{1)&}quot;H:" stands for husbands, "W:" for wives, "HH" for household.

B Full estimation results

Table 5 shows all coefficients of our random effects-cloglog estimations. Standard errors are given in parentheses. Since we estimate a random effects-model, table 5 also includes ρ , the proportion of the total variance that is contributed by the panel-level variance. It ranges from 0.45 to 0.47. The hypothesis that $\rho = 0$, which would imply that the random effects estimator is not significantly different from the pooled estimator, can be rejected on a 5 % significance level.

²⁾ All variables refer to period t-1 except household's gross income.

Table 5: Coefficients of RE-cloglog-estimations

	(1)			
	(1)		(2)	
Equal division, t-3	0.1868	(0.3004)	0.3691	(0.3335)
Non-trad. division, t-3	0.5525**	(0.2735)	0.7277**	(0.3082)
Double b. husband, t-3	-0.4541	(0.5311)	-0.2607	(0.5530)
Double b. wife, t-3	0.7594**	(0.3235)	0.9315***	(0.3532)
Trad 2, t-3			0.2599	(0.2009)
Not first marriage	-0.0141	(0.2111)	-0.0341	(0.2150)
H: age at marriage	-0.0075	(0.0208)	-0.0069	(0.0212)
W: age at marriage	-0.0132	(0.0207)	-0.0112	(0.0212)
Absolute age difference	0.0499*	(0.0256)	0.0502*	(0.0261)
Live in City	0.7948***	(0.2302)	0.8084***	(0.2333)
H: high educ	-0.7021**	(0.3540)	-0.7113**	(0.3588)
H: med educ	-0.4656*	(0.2665)	-0.4826*	(0.2702)
W: high educ	-0.2981	(0.3895)	-0.3265	(0.3963)
W: med educ	-0.2569	(0.2353)	-0.2697	(0.2388)
No. of HH members age 0-1	-0.8766***	(0.3074)	-0.8652***	(0.3083)
No. of HH members age 2-7	-0.0762	(0.1200)	-0.0216	(0.1271)
No. of HH members age 8-15	0.2405*	(0.1266)	0.2558**	(0.1283)
HH gross income, t-3	0.0447	(0.0334)	0.0386	(0.0349)
Constant	-2.8445***	(0.6695)	-3.1310***	(0.7195)
No. of obs.	8,758		8,758	
No. of couples	1,128		1,128	
ho	0.44872		0.47020	
p-value $H_0: \rho = 0$	0.028		0.020	
Log-likelihood	-931.823		-930.969	

¹⁾ Standard errors in parentheses.

^{2) *:} p<0.10, **: p<0.05, ***: p<0.01.

^{3) &}quot;H": husband, "W": wife, "HH": household.

⁴⁾ Results of marriage duration dummies not presented.

⁵⁾ Reference groups: Low educated; Traditional/Trad 1.

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