

Gender identity and wives' labor market outcomes in West and East Germany between 1984 and 2016

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Abstract

We exploit the natural experiment of German reunification in 1990 to investigate if the institutional regimes of the formerly socialist (rather gender-equal) East Germany and the capitalist (rather gender-traditional) West Germany shaped different gender identity norms of who should be the family breadwinner. We use data for three periods between 1984 and 2016 from the German Socio-Economic Panel (SOEP). Density discontinuity tests and fixed-effects regressions suggest that married couples in West (but not East) Germany diminished the wife's labor market outcomes in order to avoid situations where she would earn more than him. However, the significance of the male breadwinner model seems to decline in West Germany since reunification, converging to the more gender-egalitarian East Germany. Our work provides some evidence that political and institutional frameworks can shape fairly persistent gender identity norms that influence household economic decisions for some time, even when these frameworks change.

Keywords: gender, identity, institutions, family economics, Germany

JEL classification: J16, J12, D10

1 Introduction

We exploit the natural experiment of German division and reunification to investigate if the institutional regimes of the formerly socialist East Germany and the capitalist West Germany shaped different gender identity norms (Akerlof & Kranton, 2000, 2010) of who should be the family breadwinner. Based on representative longitudinal data on German married dual-earner couples, we explore how men’s breadwinner and women’s homemaker role affect wives’ labor market decisions in West and East Germany between 1984 and 2016. By scrutinizing if, and how, couples avoided situations where the wife out-earns her husband, we present evidence suggesting that the market economy of West Germany prior to reunification fostered a male breadwinner model, whereas the East German socialism did not.

We build on the theoretical and empirical approach of Bertrand, Kamenica, & Pan (2015) to measure the magnitude of the male breadwinner norm using the distribution of income within households. For the U.S., Bertrand et al. found that the gender identity prescription ‘a man should earn more than his wife’ is visible as a sharp drop to the right of the 50 percent threshold in the density distribution of the wife’s share of household income—where the wife starts to earn more than her husband. Because neither classic economic specialization nor marriage market models explain such a discontinuity, they took this as evidence that couples avoid the case where the wife out-earns her husband in order not to violate a male breadwinner norm. Corroborating this interpretation, Bertrand et al.’s results also suggest that wives with a higher (estimated) probability to out-earn their husbands are less likely to be in the labor force and earn less than their potential income. However, replications of their study return mixed results. Codazzi, Pero, & Sant’Anna (2017) confirmed that wives in Brazil distort their labor market outcomes to maintain gender identity conformity. Yet, no discontinuity in the wife’s share of income is found for Sweden (Hederos Eriksson & Stenberg, 2015), Finland or the U.S. (Binder & Lam, 2018; Zinovyeva & Tverdostup, 2018) after accounting for heaping issues at the 50 percent threshold. Consequently, these scholars argued that the estimated discontinuity by Bertrand et al. (2015) might be rather explained by an overrepresentation of equal-earning couples than the gender identity norm of a male breadwinner. For this reason, Lippmann, Georgieff, & Szenik (2019) did not estimate a discontinuity test on the same German data we use in this paper.

Our contribution is threefold. *First*, we account for the critique regarding the discontinuity test by ruling out alternative explanations for the heaping of a wife’s relative income of just, but not more than, 50 percent. In this way, we argue, the discontinuity test of the distribution of the wife’s

relative income is a feasible indicator for the prevalence of a male breadwinner norm.

Second, we present evidence suggesting that the prevalence of a male breadwinner norm is shaped by a country's political and institutional frameworks. A usual problem in the investigation of such a relationship is that wives' labor market outcomes are simultaneously affected by country-specific gender identity norms and by welfare state characteristics and public policy, where causal relationships are difficult to disentangle (Nyman, Reinikainen, & Stocks, 2013; Pfau-Effinger, 2012). Germany, however, was divided in two states in 1949 (West: Federal Republic of Germany/FRG and East: German Democratic Republic/GDR), separated by the wall between 1961 and 1990, and reunited in 1990. From this unique setting we hope to learn how the unlike political and institutional frameworks in West and East Germany shaped distinct breadwinner models for people who shared the same history and culture *before* the division. We argue that during 40 years of separation, public policy and promoted ideologies regarding family models and female employment led to particular social norms concerning paid and unpaid work. Moreover, because the West German institutions were imposed on East Germany following reunification, we can examine how these norms in East and West Germany persist under a common and slowly emancipating system. Considering the periods 1984–1990 for West Germany and 1991–2003 as well as 2004–2016 for West and East Germany in the discontinuity test, our results indicate that a male breadwinner norm was only prevalent in West Germany, but not in East Germany.

Third, we explore explanations how wives might have distorted their labor market outcomes to maintain gender identity conformity. Using a couple-fixed effects model with lagged regressors, we examine if wives lose their breadwinner status by leaving employment or by reducing working hours subsequent to earning more than their husbands. We gathered no evidence that gender identity conformity was restored due to the wife leaving employment altogether. However, for 1984–1990, we found that a West German wife out-earning her husband in $t-1$ had a significantly higher share of months working part-time compared to working full-time in year t .

Our results suggest that political and institutional frameworks affect gender identity norms. Since reunification, the male breadwinner model seems to have declined in significance in West Germany, converging to the consistently more gender egalitarian East Germany. This development may both be an effect of reunification as well as a general trend toward emancipation, including institutional changes in Germany. Thus, our work emphasizes the importance of simultaneous effects of persistent social norms and current institutional frameworks on female labor market outcomes.

2 Theoretical framework

2.1 *Identity economics*

Akerlof and Kranton (2000, 2010) introduced the concept of a socially determined identity to economics. In their definition of identity, a person's sense of self encompasses a clear conception of social groups the person belongs to as well as how members of these groups should behave. By including this cognition into the individuals' utility function, identity can influence economic outcomes because deviating from prescribed behavior generates costs. In terms of gender, men and women tend to conform with their sense of self in terms of gender-specific behavioral prescriptions (similar to the sociological concept of 'doing gender', West & Zimmerman, 1987). For instance, identity specific elements in the household context are 'wife' and 'husband'. In the male breadwinner model, the ideal husband plays the role of the breadwinner and the ideal wife is characterized as the homemaker (Akerlof & Kranton, 2010, p. 93). Consequently, a wife having a comparative advantage at the market would not necessarily specialize in paid work – as proposed by Gary Becker's (1991) new household economic theory – because it would violate the gender identity prescription that 'a man should earn more than his wife' and, therefore, lead to a decline in the household's utility.

Akerlof & Kranton (2000) use the term *prescriptions* rather than *norms* to emphasize that agents follow prescriptions to maintain their self-concepts, contrasting it to an understanding of norms being obeyed because non-conformity results in punishment (p. 716, footnote 2). However, in most social science literature norms are used in a broader sense, where norms include what Akerlof & Kranton have termed prescriptions (see, for example, Bertrand et al., 2015; Bertrand, Cortés, Olivetti, & Pan, 2016). Consequently, we will refer to *gender identity norms* throughout the paper, assuming that women and men correspond to these norms to avoid utility losses.

2.2 *Breadwinner norms in West and East Germany*

From an institutionalist perspective, family and labor market policies influence, among others, partner's labor market participation, the household division of labor as well as women's income shares within the household (Anxo, Fagan, Cebrian, & Moreno, 2007; Gornick, 2004). In this way, institutional differences can substantially shape the development of domestic cultures and, hence, associated breadwinner norms (Hummelsheim & Hirschle, 2010; Pfau-Effinger & Smidt, 2011). According to Bertrand et al. (2015, p. 572), the prevalence of the male breadwinner norm is reflected in the share of approval to the statement 'If a woman earns more than her husband, it is almost

certain to cause problems' from the World Value Survey (WVS). In the WVS 1995–1998, a few years after German reunification in October 1990, agreement to the statement was significantly higher in West than East Germany (West 50.2%, East 42.5%, $p < 0.001$). This difference in agreement suggests that country-specific political and institutional frameworks shaped distinct and persistent breadwinner norms— FRG (today West Germany) being rather gender traditional and the socialist GDR (today East Germany) being rather gender egalitarian (Rosenfeld, Trappe, & Gornick, 2004).

In terms of institutional and cultural dimensions, the FRG is often understood as a state promoting the prototypical male breadwinner model (Aisenbrey & Fasang, 2017). Traditional marriage and the single-earner family model was supported by various laws and policies introduced in the 1950s and 1960s (Trappe, Pollmann-Schult, & Schmitt, 2015, p. 232), many of which are still valid in present day Germany. Examples include child allowance, the dependent coverage of the non-working partner for health insurance, and the joint taxation of married couples by the 'Ehegattensplitting'. The Ehegattensplitting is a tax assessment procedure in which the income tax is imposed on half of the mutual income and then doubled. Due to the progressive income tax in Germany, this produces tax benefits for couples with unequal income while inducing negative employment incentives for second earners, increasing dependence (of predominantly women) on their working partner (Hipp, Bernhardt, & Allmendinger, 2015). Moreover, the 1958 equal rights law in the FRG stated that the right of wives to be employed depended upon the compatibility of their labor with marriage and family duties, thus reinforcing the dominance of traditional marriage (Helwig, 1993). This law was not replaced until 1977, when both partners were permitted to participate in the labor force and to choose independently who is responsible for domestic work. In 1989, women's labor market participation rate was only 56 percent and considerably lower than men's (83%) in the FRG (Rosenfeld et al., 2004, p. 111). Although legally equal in the right to work, the male breadwinner model was still dominant. In a 1991 poll, 25 percent of surveyed women in West Germany stated that homemaking was their 'dream job', in stark contrast to the 3 percent of East German women stating the same (Ute Gerhards, cited in Duggan, 1995, p. 184).

The family ideal was very different in the GDR. Women were generally expected to participate in the labor force; they were part of the socialist 'production' with full time employment seen as a norm for both men and women. Already in the 1950s, women's labor force was essential for the survival of the centrally planned economy of the GDR (Trappe et al., 2015). Facilitated by the extensive provision of public child care, the female labor force participation rate was 89 percent in

1989 (Rosenfeld et al., 2004, p. 111). However, despite the idea of a relative equality in the labor 'market', the model of equality was still patriarchal. The occupational segregation in the GDR resulted in a gender pay gap comparable to the FRG (Rosenfeld et al., 2004), women in the GDR provided far more housework than men, and women were responsible for reproductive tasks (Nickel, 1992). This 'Muttropolitik' ('mommy politics') is exemplified by a parental leave scheme only available to mothers as well as the monthly day off for women to catch up with housework (Duggan, 1995). However, although women were expected to be 'workers, mothers and housewives simultaneously', their increasing economic independence led to a devaluation of the male breadwinner norm (Trappe et al., 2015, p. 233; see also Trappe & Sørensen, 2006). In 1987, women's average financial contribution to household income was 40 percent in the GDR compared to 18 percent in the FRG (Gottfried & O'Reilly, 2002). Thus, at least in terms of female employment and income contributions within the household, the socialist GDR and its policies shaped rather egalitarian gender identity norms compared to the FRG.

However, these norms might have changed following reunification. Two different gender cultures interacted under a common – and changing – West German institutional frame. While several FRG policies supporting a traditional gender arrangement within the family remain in place (e.g. Ehegattensplitting, health insurance coverage of the dependent partner), at least some new or updated policies promote emancipated family models. Examples include the extended financial support and flexibility during parental leave, extra benefits for father's leave take-up ('Elterngeld') and the extension of the national childcare provision. The public gender equality discourse certainly also affects what is perceived as 'good' or 'adequate' behavior of women and men (Pfau-Effinger & Smidt, 2011). Conceivably, gender identity norms may not only have become more egalitarian over time, but may also have converged between West and East Germany following reunification. In the WVS 2010–2014, agreement to the statement 'If a woman earns more than her husband, it is almost certain to cause problems' was nearly equal in West and East Germany (West 16.7% and East 16.2%, $p = 0.39$).

Still, general attitudes are not necessarily a good predictor of behavior (Steiber & Haas, 2009). Additionally, institutional changes like work-family reconciliation policies introduced in unified Germany might foster gender equality in labor market outcomes, yet, evidence on this relationship is inconclusive (Brady, Blome, & Kmec, 2019). The acceptance and success of new state policies might also depend on how these policies correspond to the prevailing gender culture (Hummelsheim & Hirschle, 2010). On the one hand, there is evidence on converging gender arrangements between

West and East Germany in terms of employment patterns and the household division of market and non-market work (Kelle, Simonson, & Gordo, 2017; Rosenfeld et al., 2004; Trappe et al., 2015; Trappe & Sørensen, 2006). On the other hand, East German women consistently show less support for a traditional breadwinner arrangement and a traditional division of household labor than West German women (Adler & Brayfield, 1996; Cooke, 2007; Görge & Beblo, 2015). The female labor force participation rate remains higher in East Germany, especially for mothers (Pfau-Effinger, 2012). Full-time employment is also more common among women in East Germany, accompanied by quicker returns into full-time employment after childbirth (Kelle et al., 2017). As a result, the (unadjusted) gender pay gap remains substantially lower in East compared to West Germany. since reunification (Destatis, 2019). Lee, Alwin and Tufis (2007) even reported that, although gender ideologies grew more egalitarian in both East and West Germany, they further diverged following reunification.

The recursive relationship between individual experience of and attitudes toward female employment (Steiber & Haas, 2009, 2012) offers a plausible explanation why the male breadwinner model was not the ideal in East Germany after reunification. Because women in the GDR worked to a similar extent as their male partners and contributed a considerable share to the household income, they already *lived* an alternative to the traditional male breadwinner arrangement. Additionally, due to the widespread unemployment in East Germany following the economic turbulences of reunification, the importance of both partners being able to add to the common income remained important (Trappe & Sørensen, 2006). Conceivably, the personal experience of the mutual economic interdependence of female and male partner further contributed to the devaluation of the male breadwinner model in East Germany (Cha & Thébaud, 2009). Thus, even decades after reunification there might be differences between East and West Germany in how gender identity norms affect economic decisions of couples. This assumption is confirmed in a study sharing the German natural experiment setting with our paper by Lippmann et al. (2019). The authors show that West German wives who out-earned their husbands contributed more housework, had a higher probability of leaving the labor force, and a higher risk of divorce compared to wives in East Germany using data between 1991 to 2012.

2.3 *Hypotheses*

The current state of research suggests that the gender identity norm of a male breadwinner was considerably more prevalent in the FRG compared to the GDR. Consequently, following Akerlof

and Kranton (2000), the losses in identity by violating the social norm that ‘a man should earn more than his wife’ should have been higher in the FRG, too. Thus, assuming some cultural stability beyond reunification, we argue that married couples’ labor market decisions in the FRG/West Germany were characterized by maintaining conformity to a male breadwinner norm, whereas the decisions of couples in the GDR/East Germany were not or at least much less so. That is, we expect that only couples in the (former) FRG adjusted their labor market outcomes in order to avoid that the wife out-earns her husband. Based on the reasoning and results of Bertrand et al. (2015), we presume that such conduct is visible as a discontinuity in the distribution of the wife’s relative household income at 50 percent.

Hypothesis 1: The distribution of the wife’s share of household labor income drops at the point of spouses’ equal earnings (0.5) for West Germany but not for East Germany.

If couples avoid the wife’s crossing of the 50 percent threshold of relative household income, how do they achieve that? Conceivably, those women (theoretically) being at risk of out-earning their husbands may either not work or earn less than their potential income to preserve gender identity conformity. Using the imputed likelihood of wives to out-earn their husbands as predictor (based on the median income of the wife’s demographic group), the results of Bertrand et al. (2015) suggest this behavior. However, the sample size of our dataset does not allow for such an approach, which is why we exploit its panel character instead. We examine if wives diminish their labor market outcomes *subsequent* to out-earning their husbands similar to Lippmann et al. (2019) (Bertrand et al. do this too in auxiliary estimations). Given that the—however originated—female breadwinner status violates the male breadwinner norm, we assume that wives who earn more than their spouses attempt to recover gender identity conformity. Two plausible ways for wives to reduce their income would be to either stop working or to adjust their working hours.

Hypothesis 2: A couple where the wife’s income exceeds that of her husband subsequently attempts to restore gender identity conformity by the wife (a) leaving employment, or (b) reducing working hours. Such behavior is only observable in West Germany.

By testing these two hypotheses, we can learn something about the effects of a male breadwinner norm on female labor market outcomes. To highlight differences and possible time trends in this relationship for East and West Germany, we analyze both regions separately for various periods

between 1984 and 2016. However, we only have individual data for wives in the FRG prior to reunification. Thus, we can only attempt to deduce the prevalence of the male breadwinner model in the GDR from information surveyed in East Germany after reunification.

3 Methodology

3.1 *McCrary density discontinuity test*

We use a McCrary density discontinuity test (McCrary, 2008) to estimate the presumed drop at the 50 percent benchmark in the distribution of the wife’s relative household income. The discontinuity is specified as

$$\hat{\theta} = \ln(\hat{f}^+) - \ln(\hat{f}^-) \quad , \quad (1)$$

where f is the density of the running variable, \hat{f}^+ and \hat{f}^- denote the local linear regression estimates right and left of the cut-off, based on the bin midpoints of an under-smoothed histogram (McCrary, 2008, p. 702). We follow Bertrand et al. (2015, p. 576) and estimate the discontinuity for the wife’s share of household income to the right of the cut-off (at 0.50001). In order to ensure independence of the observations for the McCrary test, we account for the panel data structure of the SOEP by selecting the relative income of a random year for any given wife within a given analysis period. Because of sample size variations between years due to attrition and refreshment samples, not all person-year observations have the same selection probability. The period results would then be predominantly driven by the waves with the highest sample sizes. To limit the sample size bias, we re-weight the selection probabilities of person-year observations by the inverse of the year’s sample size share within the analysis period. In this way, the inclusion probability of person-year observations is increased for those years where the sample size is low. However, the unbalanced nature of our panel cannot be fully addressed by this procedure and our estimates are only slightly different compared to a fully random selection process.

3.2 *Lagged fixed effects regressions*

We estimate panel regressions with lagged regressors to identify the means by which wives might attempt to restore gender identity conformity subsequent to earning more than their husbands. One major concern is that the wife’s out-earning of her husband is conditional on unobserved characteristics of both spouses and, thus, might be endogenous. Couple fixed effects are included into the

econometric model to control for time constant unobserved heterogeneity. The following linear regression model is specified

$$\begin{aligned} \text{LaborMarketOutcome}_{it} = & \alpha_i + \beta_1 \text{wifeEarnsMore}_{i,t-1} \\ & + \beta_2 \mathbf{L}_{i,t-1} + \beta_3 \mathbf{X}_{it} + \epsilon_{it} \end{aligned} \quad (2)$$

where $\text{LaborMarketOutcome}_{it}$ is a placeholder for the dependent variables (1) wifeEMP_{it} , a dummy indicating if wife i is employed in any month in year t , and (2) wifeFTShare_{it} , containing the share of months worked full-time of wife i relative to all months worked in year t . The dichotomous regressor $\text{wifeEarnsMore}_{i,t-1}$ equals 1 if wife i earned more than her husband at $t-1$.

The dependent variables wifeEMP and wifeFTShare enable us to investigate possible channels through which a wife might attempt to recover a male breadwinner arrangement in the couple. The SOEP does only provide a weekly working hours measure at time of the interview and a very crude imputation for annual working hours, which is why we use monthly information about the (self-reported) working hours arrangement of wives, distinguishing between full-time and part-time employment. In this way, we infer changes in average working hours from changes in the full-time share of a wife's total months in employment. For the dummy variable wifeEMP our specification results in a linear probability model.

$\mathbf{L}_{i,t-1}$ is a vector of lagged control variables, containing cubic polynomials of the logarithm of the wife's and the husband's annual income, an interaction between the wife's and the husband's annual log income, and dummies indicating if the income values for wife or husband have been imputed – all at $t-1$. We do not use the wife's share of household income as covariate as Bertrand et al. (2015) because using ratios in regression models may introduce bias, even when including all ratio constituents (Kronmal, 1993). The interaction between husband's and wife's income, however, allows for varying effects of relative income contributions of spouses. The intuition behind the cubic income specification is that the consequences of a wife's out-earning of her husband might non-linearly depend on the incomes of both partners. For example, the opportunity for the wife to restore gender identity conformity by reducing her own income might be limited when both spouses have very low earnings. Similarly, when the wife earns almost all of the annual household income, there might be no sensible way to establish a male breadwinner arrangement.

\mathbf{X}_t contains additional standard controls at t : dummies for age groups of 5 years for both spouses, a set of dummy variables that indicate the age of the youngest child in the household (see online appendix Section B for details¹), the county level unemployment rate at the month of the interview, and a set of dummy variables for the survey year – all at t . The district level unemployment rate is

added to control for economic effects that may influence the income of wives and husbands differently (e.g. via short-time work) as well as their employment decisions. We report panel robust standard errors clustered on couple level to account for the panel structure of our data.

4 Data

Our estimations are based on the German Socio-Economic Panel (SOEP) spanning the years between 1984 and 2016 (v33.1, doi:10.5684/soep.v33.1; for a detailed description see Goebel et al., 2018). The SOEP is a representative longitudinal study of private households with nearly 11,000 households and about 30,000 persons sampled annually. The data provide information on all household members. Since 1984, the same private households, persons, and families have been surveyed annually in West Germany and since 1990 in East Germany. This enables us to consider the years between 1984 and 1990 preceding the reunification for West Germany, and twenty-six years for both West and East Germany, split into two decades beginning in 1991 and 2004, respectively.

We restrict our base sample to married women where both spouses are between twenty-five and sixty-four years old. In addition, our main regressor *wifeEarnsMore* is only calculated for years in which both spouses have positive labor income and work at least one month; in which neither the woman nor the husband is in education, vocational training, parental leave or civil service; or receives pensions, unemployment, or social benefits. We presume that the intra-household income distribution can only be sensibly evaluated by the wife and her husband with regard to gender identity norms when they compare their respective labor income. Moreover, we expect being in education, being a pensioner, being unemployed, or being on parental leave to be a different determination base, even if the person in question may have positive labor income. We base our estimations on inflation-adjusted pre-tax income in 2016 Euros, defined as annual labor income from primary and secondary jobs as well as bonus payments. We do not consider monthly earnings because of their possible volatility within a survey year. We use imputed income data provided by the SOEP.

In the SOEP data, there is a substantial fraction of spouses who reported exactly the same income, leading to a spike in the distribution of the wife's relative household income at 50 percent. This is a problem because the McCrary discontinuity test is biased in the presence of heaping at the cut-off. Thus, any clustering at 50 percent of the relative income of wives would result in an over-estimated discontinuity. This is also the reason why Zinovyeva and Tverdostup (2018) question the results of Bertrand et al. (2015), arguing that the estimated discontinuity may originate from spouses

having the same income because of mutual family businesses or co-working. Similarly, using Swedish data, Hederos Eriksson and Stenberg (2015) no longer found a discontinuity at 50 percent after excluding couples with self-employed spouses from the analysis. We account for this critique by excluding all couples where at least one of the spouses is self-employed. Although there is no measure in the SOEP indicating if spouses are co-working, we impute this information and additionally exclude spouses who are working in the same industry, and have the same occupation, and work in companies of the same size.

However, the remaining share of equal-earning spouses still amounts to a considerable 0.6 percent of working couples. As top-coded or imputed income values also do not explain the spike, we presume it to be a result of rounding behavior by survey respondents. In fact, rounded values are much less present in German administrative income tax data (FAST 2010, doi: 10.21242/73111.2010.00.00.3.1.0) than in the SOEP. Therefore, we de-round the fraction of potentially rounded income values (integer multiples of 50, 100, 500, 1000, 5000, and 10000) that exceeds the respective fraction in the administrative data. For example, if 1 percent of income values are an integer multiple of 100 in the SOEP, but only 0.3 percent in the tax data, then we de-round the 0.7 excess percentage points of income values. (A detailed account of the de-rounding procedure is provided in Section A of the online appendix.) By de-rounding, the share of equal-earning partners in the analysis sample is reduced to 0.2 percent. Because this is still slightly higher than the 0.1 percent in the tax data, we additionally delete observations causing the remaining excess spike. Thus, our discontinuity estimates can be considered as being fairly conservative. We randomly determine which income values are de-rounded or deleted. To account for possible selection bias introduced by this process, we repeat every discontinuity test and regression 100 times with prior de-rounding and subsequent deletion of the remaining excess spike and average the estimated coefficients.

Another recently proposed explanation for the discontinuity in the distribution of the wife's relative household income at 50 percent is strategic misreporting in surveys to maintain gender identity conformity. For the U.S. and Switzerland, respectively, Murray-Close and Heggeness (2018) and Roth and Slotwinski (2018) showed that spouses overreport the husband's income and underreport the wife's income if she earns more than him. We cannot specifically account for this possible caveat within the SOEP, however, we will discuss this possibility in light of our results. In any case, the discontinuity would be the effect of a male breadwinner norm – either by wives actually earning less than their husbands or by at least stating to do so.

Table 1. Summary statistics of main variables by region and period

	West Germany 1984–1990		West Germany 1991–2003		West Germany 2004–2016		East Germany 1991–2003		East Germany 2004–2016	
	Mean	Std. Dev.								
Working couples										
<i>Husband</i>										
Annual labor income (gross)	25 334.30	12 528.74	37 549.14	20 820.62	45 965.31	26 931.67	23 893.56	11 971.92	33 497.55	18 493.06
Full-time share of worked months	0.99	0.07	0.98	0.12	0.96	0.19	0.98	0.12	0.97	0.16
<i>Wife</i>										
Annual labor income (gross)	11 236.92	9523.00	16 434.73	13 064.81	19 540.52	16 521.05	18 950.89	9638.46	24 536.93	13 821.77
Full-time share of worked months	0.42	0.49	0.37	0.48	0.29	0.45	0.73	0.43	0.56	0.49
Wife's share of household income (gross)	0.29	0.16	0.29	0.17	0.29	0.17	0.44	0.13	0.42	0.16
Wife earns more	0.08	0.27	0.10	0.30	0.11	0.31	0.33	0.47	0.33	0.47
N (couples-years)	7,231		14,399		19,901		5,133		4797	
N (couples)	1985		3800		5486		1198		1126	
All couples										
<i>Husband</i>										
Employed	0.89	0.32	0.86	0.35	0.87	0.34	0.80	0.40	0.82	0.38
<i>Wife</i>										
Employed	0.52	0.50	0.61	0.49	0.73	0.45	0.69	0.46	0.77	0.42
N (couple-years)	21,136		39,759		48,133		14,103		11,898	
N (couples)	3,978		7,459		10712		2,197		2,311	

Note: Weighted. 'Working couples' refers to the sample restrictions outlined in this section. 'All couples' refers to all married couples between age 25 and 64 in the data. Income related statistics are based on (once) de-rounded income values. Income reported in Euro. As the annual income is calculated based on answers by survey respondents in the subsequent year, income related statistics do not include values for 2016.

All restrictions applied, we are left with a total of $n=10,584$ working couples. Table 1 displays summary statistics of our main variables separately for West as well as East Germany for all considered periods. Not only were wives consistently less likely to be in employment than their male spouses, they also earned less when working. Still, there were important differences between East and West Germany that reflect their distinct history. On average, wives in East Germany between 1991 and 2003 contributed 44 percent to the household labor income working 73 percent of months in full-time, whereas wives in West Germany contributed just 29 percent working 37 percent of months in full-time. Consequently, female breadwinners were more prevalent in East Germany in this period: Only 10 percent of wives earned more than their husbands in West Germany but 33 percent in East Germany. This picture remains largely unchanged for the period between 2004 and 2016, although part-time employment increases in West and East Germany.

The employment rates of wives rose continuously in West Germany since reunification (from 52% to 73%), but the share of wives out-earning their husbands remains remarkably small (2004–2016: 11%). This development is most likely an effect of the increased share of part-time working women. However, whereas these figures suggest a departure from the single earner model in West Germany, they do not necessarily reflect a trend toward less prevalence of the male breadwinner norm.

Further, the low number of female breadwinners in West Germany also limits the power of the panel regressions because the within-variation of *wifeEarnsMore* is rather small (see online appendix Section B for detailed panel summary statistics.). Nonetheless, most of the variables are available for at least three waves for each couple and, thus, are a good basis for a fixed effects panel regression.

5 Results

5.1 *The distribution of relative income*

Table 2 provides the discontinuity estimates for working couples. Figure 1 shows the corresponding distributions and the local linear regression smoother. For West Germany between 1984 and 1990 (Fig. 1a), the estimated discontinuity at 50 percent of the wife’s income share was negative and significant ($p < 0.001$). The distribution dropped by 51.9 percent. Whereas the proportion of wives increases between income shares of 0.2 and 0.5, the proportion drops abruptly at the point of spouses’ equal earnings. This result suggests that couples avoided circumstances where the wife earns more than her husband, because the discontinuity at *exactly* 0.5 is not likely to be just an effect of,

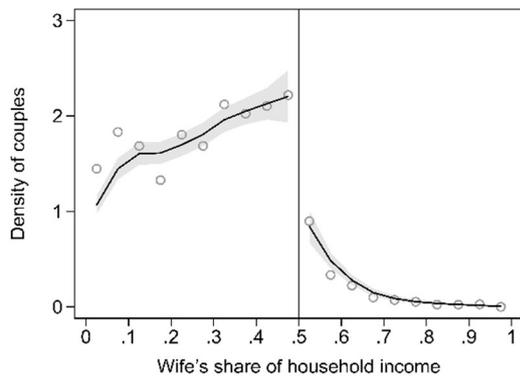
for example, assortative mating, working preferences or the gender pay gap. For the later decades, shown in Figures 1b and 1d, the drop decreased to a still significant 22.8 percent ($p = 0.03$) for 1991–2003 and an insignificant 8.9 percent for 2004–2016 ($p = 0.42$).

Table 2. *Density discontinuity estimates working couples*

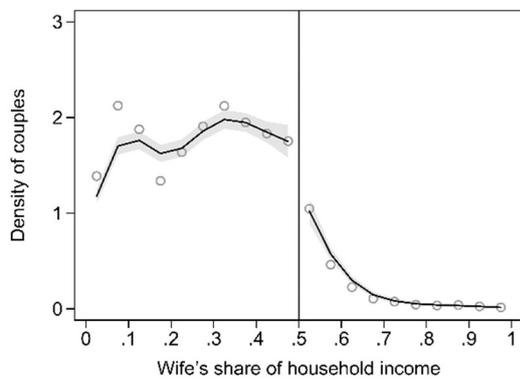
	<i>West Germany</i>				<i>East Germany</i>				<i>West vs. East</i>	
	$\hat{\theta}$	SE	% Drop	N	$\hat{\theta}$	SE	% Drop	N	$\Delta\hat{\theta}$	SE
<i>Decade</i>										
1984–1990	−0.74***	0.16	51.89	1,764						
1991–2003	−0.26*	0.12	22.76	3,800	−0.04	0.14	3.80	1,198	0.22	0.23
2004–2016	−0.10	0.12	8.89	5,486	−0.18	0.15	16.10	1,126	0.08	0.27
	$\Delta\hat{\theta}$	SE			$\Delta\hat{\theta}$	SE				
<i>Difference Periods</i>										
1984–1990 vs. 2004–2016	0.64**	0.23								
1984–1990 vs. 1991–2003	0.48*	0.20								
1991–2003 vs. 2004–2016	0.17	0.18			0.14	0.20				

Note: Discontinuity estimated for the distribution of the wife’s share of household income using a McCrary Test (2008). Restricted to married couples where spouses are between age 25 and 64, where wife and husband have positive annual income, worked at least one month, and are not in education, vocational training, civil service or parental leave, are not self-employed, and do not receive unemployment benefits or pensions in year $t-1$. Cut-off at 0.50001, bin size 0.05, optimal (automatic) bandwidth. Averaged over 100 simulation runs based on procedures described in the data section. As annual income is calculated based on answers by survey respondents in the subsequent year, income related statistics for the period 2004–2016 are based on annual incomes between 2004 and 2015. Significance of differences based on two-tailed t-test; *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.1$

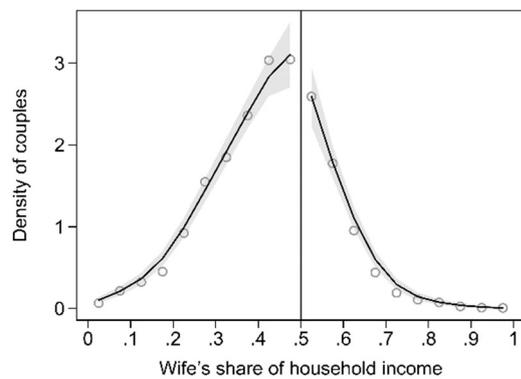
The male breadwinner norm seems to have become less relevant over time in West Germany. A two-sample t-test pairwise comparing the discontinuities between all decades acknowledged a significant decline between 1984–1990 and 1991–2003 ($p = 0.01$) as well as 1984–1990 and 2004–2016 ($p = 0.02$, see Table 1). However, the distributions displayed in Figures 1b and 1d also show that this decline did not correspond to a notable increase in the share of wives who actually earn more than their husbands. Thus, although the 0.5 threshold appears to have lost relevance, the male breadwinner model is still predominant in dual-earner households in West Germany. The growing shares of women in part-time employment are a likely explanation, which we will review in more detail in the discussion.



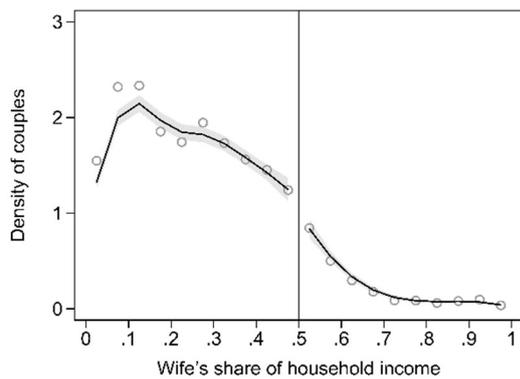
(a) West Germany, 1984–1990



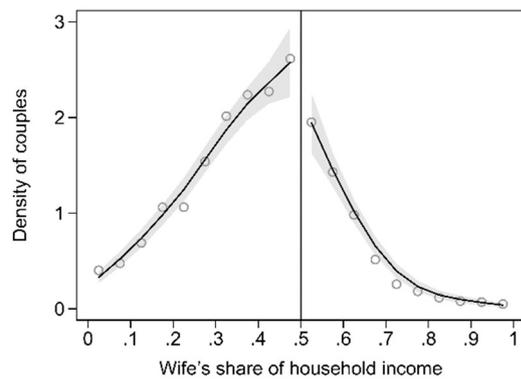
(b) West Germany, 1991–2003



(c) East Germany, 1991–2003



(d) West Germany, 2004–2016



(e) East Germany, 2004–2016

Figure 1. Distribution of relative annual income of wives over time for West and East Germany. Dots reflect the midpoints of a histogram with a bin width of 0.05, the solid line is the local linear regression smoother allowing for a break at the cut-off, CI 95%.

For East Germany, we found no significant discontinuities for either 1991–2003 or 2004–2016 (see Table 2). The continuous distribution suggests the persistence of more egalitarian gender identity norms in the former GDR. This is also reflected in the distributional differences and the substantially higher fraction of female breadwinners compared to West Germany. However, despite the substantial drop difference of almost 20 percentage points for 1991–2003, the discontinuity estimates for West and East Germany were not significantly different from each other. The small sample size is a clear constraint in this case. Between 1991–2003 and 2004–2016, the drop in the distribution increased from 3.8 to 16.1 percent for East Germany and was for 2004–2016 larger than the drop for West Germany (8.9%). This development might suggest a slight revitalization of more traditional gender identity norms in East Germany under a West German framing. Yet, a two-sample t -test comparing the discontinuities of both decades for East Germany was insignificant.

All in all, our findings confirmed *Hypothesis 1*, but only for the periods 1984–1990 and 1991–2003. For 2004–2016, the distribution of the wife’s share of household income exhibits no significant drop at 50 percent for either West Germany or East Germany.

5.2 *Relative income and labor market outcomes*

One potential reason for the identified discontinuities in the density of relative income is that wives diminish their labor market outcomes in order to restore gender identity conformity after earning more than their husbands. Table 3 presents the effect of a wife’s out-earning of her husband in year $t-1$ on two different outcomes in year t .

One extreme way for wives to diminish their income would be for them to leave employment. Panel A presents the estimates of the predicted change in the probability that the wife is in employment in year t when she earned more than her husband in year $t-1$. Our results do not support *Hypothesis 2b*. A wife who out-earned her husband in year $t-1$ was not less likely to be employed in the subsequent year in any of the analysis periods. In auxiliary estimations we also found no evidence that wives reduced the number of annual months in employment instead. (The economically significant negative effect for East Germany 1991–2003 is most likely an effect of the economic turbulences following reunification as it disappears when excluding the years 1991 and 1992.)

However, leaving employment is very costly. Thus, wives who earn more than their husbands might prefer to stay employed and reduce their working hours to restore a male breadwinner arrangement. Panel B displays the estimated effects on the wife’s share of months worked full-time

(instead of part-time) relative to the total number of months worked in in t . Our results are partly in line with *Hypothesis 2c*, at least for West Germany between 1984 and 1990. In this period, the wife's full-time share of worked months was, on average, significantly reduced by 6.4 percentage points ($p < 0.001$) in year t if she out-earned her husband in year $t-1$. Assuming that a wife worked every month in $t-1$ and t , the relative effect corresponds to working three quarters of a month more in part-time instead of full-time in t . For 1991–2003, the effect was only slightly negative and insignificant ($\hat{\beta}_1 = -0.007$, $p = 0.714$) and even turned positive for 2004–2016 ($\hat{\beta}_1 = 0.013$, $p = 0.437$). This development might emphasize a trend toward more egalitarian gender identity norms in West Germany as also suggested by the discontinuity estimations. Besides, we also tested if wives reduced their weekly working hours measured at time of the interview in t after out-earning their husbands in $t-1$ and obtained similar results (see Tables in Section D of the online appendix).

Table 3. Panel regression estimates

	West Germany			East Germany	
	(1) 1984–1990	(2) 1991–2003	(3) 2004–2016	(4) 1991–2003	(5) 2004–2016
Panel A – Dependent variable: <i>Wife is employed in t</i>					
<i>wifeEarnsMore in t-1</i>	-0.009 (0.014)	0.000 (0.008)	0.006 (0.006)	-0.014† (0.008)	0.004 (0.007)
R-squared	0.084	0.069	0.034	0.065	0.042
R-squared (adj.)	0.078	0.066	0.032	0.052	0.033
N (couple-years)	5,853	12,380	16,383	2,881	4,200
n (couples)	1,695	3,296	4,449	813	981
Panel B – Dependent variable: <i>Full-time share of wife's worked months in t</i>					
<i>wifeEarnsMore in t-1</i>	-0.064*** (0.019)	-0.007 (0.017)	0.013 (0.016)	0.004 (0.024)	-0.009 (0.022)
R-squared	0.139	0.116	0.071	0.038	0.037
R-squared (adj.)	0.133	0.114	0.068	0.024	0.028
N (couple-years)	5,461	11,949	15,938	2,841	4,154
n (couples)	1,543	3,187	4,308	799	967

Notes: Unweighted regressions with couple fixed effects. *wifeEarnsMore* is a dummy denoting if the wife earned more than her husband in a given year. Restricted to married couples where spouses are between age 25 and 64, where wife and husband have positive annual income, worked at least one month, and are not in education, vocational training, civil service or parental leave, are not self-employed, and do not receive unemployment benefits or pensions in year $t - 1$. All models include a cubic polynomial of the logarithm of the wife's and the husband's annual income, the wife's share of household labor income, and dummies indicating if the income values for wife or husband have been imputed – all at $t - 1$. All models include dummies for age groups of 5 years for both spouses, dummy variables for the age of the youngest child in the household, the district level unemployment rate at the month of the interview, and dummy variables for the survey year – all at t . Averaged over 100 simulation runs based on procedures described in the data section. Standard errors clustered on couple level in parentheses; † $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

5.3 *Robustness*

The estimated discontinuity using the McCrary Test is conditional on several parameters. The chosen bin size of the underlying histogram as well as the bandwidth of the local linear regression estimation affects the fit of the smoothed function. However, we used the optimal bandwidth as proposed by McCrary (2008) with different bin sizes (0.01, 0.02, 0.05). Overall, we obtained fairly similar estimates (see online appendix Tables C.6–C.7).

Moreover, we repeated the discontinuity test also including unmarried cohabiting couples to test for selection issues arising from decreasing marriage rates over time. The discontinuity estimates were robust to this inclusion (see online appendix Table C.2).

Gender identity norms are specific for certain cultures. However, people born outside of Germany are oversampled in several waves of the SOEP. To ensure that the estimated effects were not driven by couples whose gender identity was not shaped by East or West Germany, we repeated our analyses excluding couples where both of the spouses were not born in Germany. Although the loss in sample size resulted in some of the estimated effects becoming insignificant, the respective coefficients remained by and large stable (see online appendix Tables C.3 and D.4–D.7).

We assigned couples to East or West Germany based on the place of residence at time of the interview. Consequently, couples who were socialized in one part of Germany but subsequently moved to the other might bias our estimates. However, our results were unchanged when we restricted the sample to couples who had not moved to a different part of Germany prior to their interview (see online appendix Tables C.4 and D.7–D.9).

Additionally, not deleting the excess spike of equal earning couples compared to the tax data had no substantial effects on our results (see online appendix Tables C.5 and D.10–D.12). The same was true for the panel regression estimates when excluding the interaction between the wife’s and the husband’s income, when using the base regression specification of Bertrand et al. (2015, pp. 610–611), and when excluding the imputation indicator dummies (see online appendix Tables D.13–D.24).

6 Discussion

The present paper explored how the gender identity norm of a male breadwinner affects household economic decisions in East and West Germany. We exploited the unique history of once divided Germany and examined the periods 1984–1990 for West Germany, plus both 1991–2003 and

2004–2016 separately for West and East Germany. Our results suggest that different political and institutional frameworks shaped rather gender-traditional breadwinner norms in the FRG, today West Germany, and rather gender-egalitarian breadwinner prescriptions in the GDR, today East Germany. Yet, these prescriptions seem to have converged after reunification to an overall rather egalitarian level.

Hypothesis 1 stated that there is a drop in the distribution of the wife's share of household income at the 50 percent threshold for West Germany, because couples avoid the situation where the wife out-earns her husband due to a prevailing male breadwinner norm. This was partly confirmed. The drop in the distribution was highest for 1984–1990, yet continuously declined thereafter and was insignificant for 2004–2016. For East Germany, the drop was consistently smaller and insignificant. Distinct gender identity norms concerning female labor force participation and who should be the family breadwinner in the formerly socialist East Germany and the capitalist West Germany offer a potential explanation for this difference. However, the development of the discontinuities following reunification suggests an overall convergence between West and East Germany, which is in line with other findings. The much stronger trends for West Germany are presumably both an effect of convergence to East Germany as well as an effect of a general trend toward emancipation, including institutionally enhanced labor market opportunities for women. In this perspective, our results are also not necessarily at odds with those of Lee et al. (2007), who found that gender beliefs became more egalitarian in East and West Germany following reunification, but did not converge. Apparently, gender identity prescriptions have always been egalitarian 'enough' in East Germany to make the 50 percent benchmark of wife's relative earnings largely irrelevant, irrespective of any further emancipation.

Hypothesis 2 stated that a couple where the wife out-earns her husband attempts to recover gender identity conformity. We gathered no evidence that a male breadwinner arrangement was (re-)established due to the wife leaving employment. However, for West Germany 1984–1990, we found that wives who earned more than their husbands in year $t - 1$ worked more months in part-time instead of full-time in year t (+6pp.). Apparently, wives rather reduced their working hours instead of (temporarily) leaving employment to earn less than their spouses. No significant effects on the wife's full-time share of worked months were obtained for West Germany for 1991–2003 and 2004–2016, emphasizing a development toward less traditional gender identity prescriptions in West Germany following reunification. For East Germans, the male breadwinner prescription seemed to be of no

particular significance. The wife's out-earning of her husband did not affect her labor market outcomes in any of the analyzed periods.

Our results are subject to several *limitations*. The discontinuity in the distribution of the wife's relative income is only a local indicator around the 50-percent benchmark. If wives who earn slightly less than half of the household income switch to part-time work, thus decreasing their income share, then the estimated discontinuity narrows. Consequently, a smaller discontinuity does not necessarily imply a declining relevance of the male breadwinner prescription if increased part-time work is also the result of gender identity prescriptions. However, the increased share of part-time working women since reunification, particularly in West Germany, might rather be an opportunity effect than a gender identity effect. Between 1991 and 2017, the share of women working part-time (<31h per week) increased considerably from 34.3 percent to 48.7 percent in West Germany, and from 17.5 percent to 35.1 percent in East Germany (Hobler & Pfahl, 2018). This trend indicates enhanced opportunities for wives to work part-time and also explains part of the rise in the female employment rates in West Germany (see also Table 1). Naturally, part-time working wives are less likely to out-earn their almost exclusively full-time working husbands. Only 11 percent of men worked part-time in Germany in 2017, with minor differences between West and East Germany.

Another important issue is that the discontinuity in the distribution of the wife's share of household income might be a result of strategic misreporting of spouses to maintain a male breadwinner arrangement (Murray-Close & Heggeness, 2018; Roth & Slotwinski, 2018). In this case, the discontinuity would also reflect a male breadwinner norm, but it would not derive from wives diminishing their actual income. However, we believe that such misreporting cannot fully explain our findings. Especially for West Germany prior to reunification, the distribution of the wife's relative income and the considerable discontinuity are hardly just the result of an over- and underreporting of husband's and wife's incomes by a few percent. Moreover, the strong trend in discontinuities for West Germany following reunification would also be difficult to explain just by a decline in misreporting. Still, augmenting our analysis by administrative data is a sensible next step for future research.

Further, the limited sample size of the SOEP combined with a region- and period-specific estimation involves large standard errors and, therefore, an increased probability of type II errors, resulting in an overall rather conservative estimation. In the used fixed effects specification only the change in the variables over time for a given couple is considered. Consequently, variation in *wifeEarnsMore* was only generated by a change in the income of one of the spouses large enough to

move the wife's share of household labor income above the 50 percent threshold. If spouses try to maintain gender identity conformity as the discontinuity plots suggest, then the probability of wives to actually cross this threshold is already low. This particularly concerns wives who selected into part-time employment in order to avoid out-earning their husbands in the first place. However, because we differentiated between West and East Germany over different time periods, the sample size of the SOEP was not sufficient to use the imputed likelihood approach of Bertrand et al. (2015). This would have enabled us to consider changes in the wife's imputed probability of earning more than her husband based on the median income of her demographic group in the fixed effects model – instead of analyzing the effect of the wife's actual out-earning of her husband.

The timespan covered by the utilized dataset is also not ideal. Although the SOEP is exceptional for our purpose (no other German panel covers a larger period), it provides no data before 1984 for West Germany and no data before 1990 for East Germany. Thus, we can only extrapolate from our results that the differences in breadwinner norms were probably larger preceding reunification. Using comparable data on both parts of Germany considerably for earlier periods would greatly facilitate the identification of genuine differences and trends. For example, the male breadwinner model was most prevalent in West Germany between the 1950s and 70s (Trappe et al., 2015), presumably also having a stronger impact on household economic decisions of couples at this time.

7 Conclusion

Based on the unique history of German division and reunification, we presented evidence that political and institutional frameworks can shape gender identity norms of who should be the family breadwinner. We found that only couples in West Germany avoided situations where the wife out-earns her husband, suggesting that the male breadwinner norm was more prevalent in West Germany than in socialist East Germany prior to reunification. After reunification, breadwinner prescriptions appear to have become less traditional in West Germany, converging with the consistently more gender-egalitarian East Germany. Thus, household economic decisions are presumably less affected by the male breadwinner model in present-day Germany. Still, our results also suggest that gender identities forged by political and institutional regimes can be fairly persistent. Although the economically and ideologically driven employment and family policy of the socialist GDR was patriarchal in many respects, some emancipative elements seem to have had long lasting effects to the present day. Clearly, using public policy to enhance women's labor market participation and economic opportunities is one important contribution to gender equality.

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Endnotes

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