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Gender Identity and Women's Supply of Labor and Non-Market Work: Panel Data Evidence for Germany

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ABSTRACT

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This paper aims to verify results of the innovative study on gender identity for the USA by Bertrand et al. (2015) for Germany. They found that women who would earn more than their husbands distort their labor market outcome in order not to violate traditional gender identity norms. Using data from the German Socio-economic Panel Study we also find that the distribution of the share of income earned by the wife exhibits a sharp drop to the right of the half, where the wife's income exceeds the husband's income. The results of the fixed effects regression confirm that gender identity has an impact on the labor supply of full time working women, but only in Western Germany. We also show that gender identity affects the supply of housework but in contrast to the US where women increase their contribution to non-market work when they actually have a higher income than their husbands, we find for Germany that women only barely reduce their weekly hours of non-market work once their income exceeds that of their husbands.

JEL Classification: D10, J12

Keywords: gender roles, gender gap, female labor supply, non-market work

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1 Introduction

Recently, the influence of social norms on labor market outcomes became of interest to economists to explain the persistence of gender gaps. In an innovative publication, Bertrand et al. (2015) have reported that gender identity, specifically the man's role of the breadwinner and the woman's role of the homemaker, affects economic decisions in the household. They showed that gender identity has an impact on who marries whom. They also demonstrated that women who would earn more than their husbands are more likely to leave the labor force and to earn less than their potential income conditional on working. They further showed that violating traditional gender roles generates costs. Couples where the wife earns more are more likely to get divorced. Their results suggest that the wife's contribution to non-market work is higher when she earns more than her husband, supposedly in order to reinforce gender identity.

This paper attempts to verify parts of the study of Bertrand et al. (2015) for Germany using data from the Socio-Economic Panel (SOEP). Our aim is to explore if gender identity affects economic decisions in the household in Germany as well. The next chapter presents the concept of identity economics and states the hypotheses. Chapter three provides the empirical results: In the first part, the distribution of relative income in Western and Eastern German households is analyzed. The next part explores if women in Germany leave the labor force or distort their income if they earned more than their husbands. The last part of chapter three examines if women who actually have a higher income than their husbands increase their contribution to non-market work. Finally, chapter four provides a short summary and conclusion.

2 Theoretical background and hypotheses

2.1 Identity economics

Akerlof and Kranton (2000) expanded economic analysis by including identity as a non-pecuniary motive into the utility function of individuals. They defined identity as a person's sense of self and it is integrated into a utility function via social categories. Social categories could be characteristics that are fixed and predetermined, like a person's sex or skin color, but in other cases people can choose which social category they want to belong to, for example people can choose their profession and whether to be a smoker or a nonsmoker. In the setting designed by Akerlof and Kranton (2000), j's utility U_j depends on her own actions $\mathbf{a}_j$ and other peoples'

actions $\mathbf{a}_{-j}$ as well as on her identity I_j:

$$U_j = U_j\left(\mathbf{a}_j, \mathbf{a}_{-j}, I_j\right) \tag{1}$$

In addition to the vectors of actions $\mathbf{a}_j$ and $\mathbf{a}_{-j}$, j's identity I_j depends on her assignment to social categories $\mathbf{c}_j$ and the corresponding prescriptions $\mathbf{P}$ that define how members of a social category should behave in a specific situation, but also on the degree her own characteristics match the prescriptions of her social category $\boldsymbol{\epsilon}_j$:

$$I_j = I_j\left(\mathbf{a}_j, \mathbf{a}_{-j}, \mathbf{c}_j, \boldsymbol{\epsilon}_j, \mathbf{P}\right) \tag{2}$$

In the simplest scenario, j maximizes her utility taken as given $\mathbf{a}_{-j}$, $\mathbf{c}_j$, $\mathbf{P}$ and $\boldsymbol{\epsilon}_j$. Akerlof and Kranton's (2000) work suggests that people not only have identity based payoffs by their own action but also by other people's action. For example, workers in a typical male profession, like in the coal industry, might feel less "manly" if they have female co-workers. So the presence of women would threaten their identity and cause discomfort (Akerlof and Kranton, 2000, p. 723). Furthermore, identity-based payoffs are not fixed, they can change over time. This change can develop in the society or it can be influenced by third parties, for example by advertisement or by public policy (Akerlof and Kranton, 2000, p. 717).

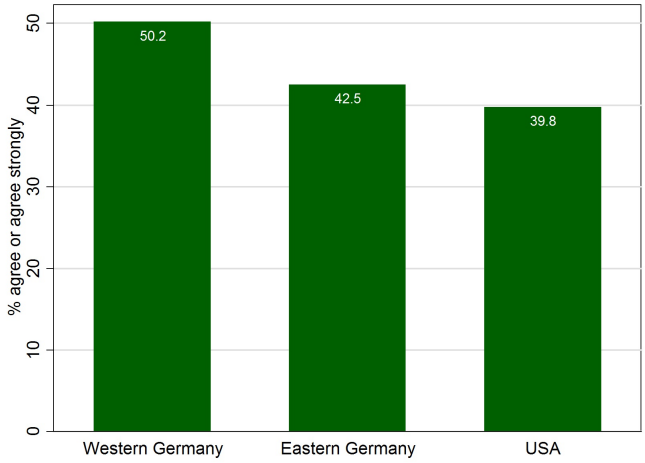
2.2 Economics of the household and gender identity

One important aspect of a person's identity is his or her gender. The work of Bertrand et al. (2015) suggests that gender identity impacts the labor supply of wives and the division of non-market work in American households.
Following the procedure to integrate identity into economics proposed by Akerlof and Kranton (2010), the first step is to define a standard economic model for the labor supply of wives and the division of non-market work in the household. A simple and popular model is Gary Becker's new household economic theory[1]. Gender is not explicitly part of the model, but Becker (1991) argues that there is a biological difference in the sexes that gives women a comparative advantage at the household[2], given they make the same investments in human capital.

[1] See chapter 2 in Becker (1991).

[2] Becker (1991) argues that women "have a heavy biological commitment to the production and feeding of children, but they also are biologically committed to the care of children in other, more subtle ways", whereas the man "completes his biological contribution to the production of children when his sperm fertilizes a woman's egg" (Becker, 1991, p. 37).

Figure 1: Attitude towards gender roles in Germany and the USA



Notes: Data from the World Value Survey 1994-1999, N=940 (Western Germany), N=957 (Eastern Germany), N=1443 (USA). Own illustration, based on Bertrand et al. (2015).

In the second step, identity specific elements are defined. Social categories in the household context are "wife" and "husband" and an ideal husband plays the role of the breadwinner, whereas the ideal wife is characterized as the homemaker (Akerlof and Kranton, 2010, p. 93). So Bertrand et al. (2015) define prescriptions as "a man should earn more than his wife" (Bertrand et al., 2015, p. 572). This can be motivated by Figure 1, which illustrates the share of approval to the statement "If a woman earns more than her husband, it's almost certain to cause problems" in Western and Eastern Germany and in the United States of America (USA) from the World Value Survey (WVS) 1995-1998. In all three cases, more than one third of the respondents either agreed or agreed strongly to the statement. This attitude might affect the labor supply of wives as a violation of the prescription would lead to a decline in the household's utility (Bertrand et al., 2015).

2.3 Hypotheses

If Bertrand et al. (2015) are right, a wife who has a comparative advantage at the market would not specialize in the market and her husband who has a comparative advantage at the household would not specialize in the household as it is proposed by Becker (1991) because that would violate gender role prescriptions. Following the reasoning from Bertrand et al. (2015), our first hypothesis is:

Hypothesis 1: Labor supply

A wife whose income would exceed that of her husband distorts her labor market outcome in order not to violate identity norms. She achieves that by

(a) leaving the labor force, or

(b) distorting her earnings.

The new household economic model suggests that, in a situation where the wife actually earns more than her husband, the wife reduces the time she spends on non-market work in comparison to her husband. Considering gender identity the opposite is true because women try to balance the violation of gender roles by releasing her husband from the "feminine" housework. So the second hypothesis states:

Hypothesis 2: Non-market work

A wife who actually earns more than her husband mitigates the reversal in gender roles by increasing her contribution to home production activities.

The results presented by Bertrand et al. (2015) supported these hypotheses. Using the concept of identity economics, they could explain the sharp drop in the distribution of relative income at the 50 percent benchmark. Furthermore, they found a statistically significant negative effect of the probability that the wife earns more than her husband on the labor supply of wives and a statistically significant positive effect on the wife's hours of non-market work if she earns more than her husband.
Figure 1 demonstrates that the agreement to the statement "If a woman earns more money than her husband, it's almost certain to cause problems" is higher for German respondents of the WVS. So it is interesting to find out whether the hypotheses presented before can be supported for Germany as well.
With 50.2 percent, the agreement in Western Germany in Figure 1 is higher than in Eastern Germany (42.5 percent), this difference is statistically significantly[3]. As, according to Akerlof and Kranton (2010), identity norms shape slowly and can be influenced, for example by public policy, this difference could be due to different ideals and laws of the division of labor in the marriage of the political regimes during the time of German separation.
In the German Democratic Republic (GDR), women were formally allowed to participate in the labor force since 1950 and equality of men and women was stated in the constitution since 1961 (Helwig, 1993, p. 10). Women, like men, were part

[3] A two-proportion z-test of the Null Hypothesis that the proportion of agreement is lower in Western Germany than in Eastern Germany is rejected with $p<0.001$.

of the "production" and full time employment was a duty for men and women in the GDR, what resulted in a female labor force participation rate of more than 90 percent (Dölling, 1993, p. 29ff.). The socialist ideal of a family was a married couple with two or three children, where both parents are supposed to work full time and housework should be divided between husband and wife (Gysi and Meyer, 1993, p. 140).

The socialist ideal of a family was different from the ideal in the Federal Republic of Germany (FRG). The traditional marriage, where the husband is the breadwinner and the wife is responsible for the household, was supported by various laws and policies that were introduced in the 1950's and 1960's, and are in parts still valid today. Some examples are the "Ehegattensplitting"[4], child allowance and the dependent coverage of the partner at the health insurance. Especially the equal rights law from 1958 in the FRG, that stated that the right of employment of wives depends on the compatibility with their duties in marriage and family, buttressed the dominance of the traditional marriage at the time (Helwig, 1993, p. 13). This law wasn't replaced until 1977, when both partners were permitted to participate in the labor force and to independently choose who is responsible for domestic work (Helwig, 1993, p. 18).

Even more than two decades after the reunification, desired and actual working hours are substantially higher for Eastern German women than for Western German women (Holst and Wieber, 2014).

As the role of the wife as a homemaker was highly encouraged in Western Germany before the reunification and the agreement to traditional gender roles in the WVS in Western Germany is significantly higher than in Eastern Germany, the losses in identity when violating the prescription "a man should earn more than his wife" should be higher in Western Germany and have a higher impact on the wives' supply of labor and chores in Western Germany. For this reason, the data is analyzed separately for Western and Eastern Germany in chapter 3.

3 Results

The following chapter provides our results based on the Socio-Economic Panel (SOEP)[5] (Wagner et al., 2007). The SOEP is a representative longitudinal study

[4] With the "Ehegattensplitting" the income tax can be jointly calculated for married couples. 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 and induces negative employment incentives for the second earner.

[5] Socio-Economic Panel (SOEP), data for years 1984-2012, version 29, SOEP, 2013, doi:10.5684/soep.v29.

of private households, located at the German Institute for Economic Research with nearly 11,000 households and about 30,000 persons sampled each year. The data provide information on all household members, consisting of Germans living in the Old and New German States. Since 1984 ,the same private households, persons and families have been surveyed annually. Already in June 1990, the SOEP expanded to include the states of the former GDR.

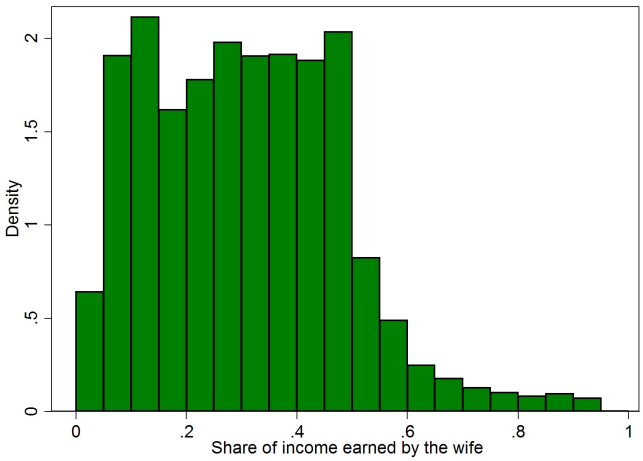
3.1 The distribution of relative income

Bertrand et al. (2015) suppose that women have an aversion to earning more than their husbands and that this aversion should be visible in the distribution of the relative income of married couples. They conducted a McCrary test for discontinuity (McCrary, 2008) and found a sharp and statistically significant drop in the distribution of relative income at 0.5 (Bertrand et al., 2015, p. 575ff.).
For Germany, in a first step, histograms are used to study the distribution of relative income. The McCrary test (McCrary, 2008) is used in a second step as a formal test of discontinuity in the share of income earned by the wife, which is defined as:

$$antlabgro_{it} = \frac{iblabgro_{it}}{iblabgro_{it} + iblabgro\_m_{it}} \tag{3}$$

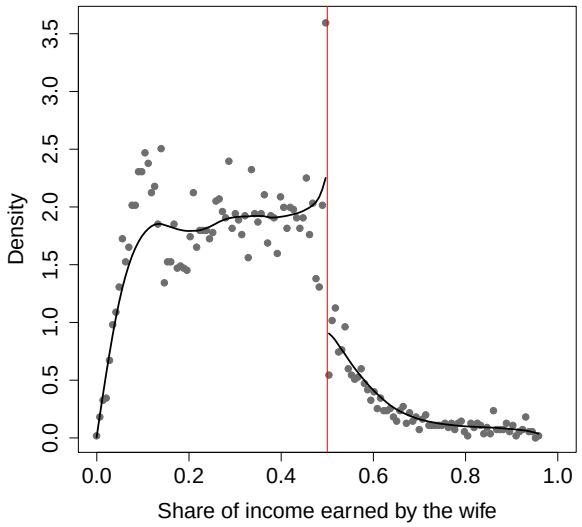
$iblabgro_{it}$ and $iblabgro\_m_{it}$ are the wife's and the husband's inflation adjusted pretax income.
For the analysis of the distribution of relative income, the sample is restricted to married women where both spouses have a positive income and are between twenty-five and sixty-four years old. Also, an observation is dropped if the woman or her husband is still in education. The SOEP is a panel data set, in order to ensure independence of the observations for the McCrary test, only one observation per wife is randomly selected.
Relative income in Western Germany from 1984 to 2012 is below 0.5 for the majority of observations, meaning that in most of the cases, the woman earns less than her partner that year (Figure 2). In fact, in only 11.16 percent of the observations, women have a higher income than their partner that year. Excluding a small drop between 0.15 and 0.2 the distribution of relative income looks almost like a uniform distribution between 0.1 and 0.5. Like in the results of Bertrand et al. (2015), the histogram shows a sharp drop of the distribution of relative income at the 50 percent benchmark.
Figure 3 provides a graphical presentation of the McCrary test for Western Germany. The density function shows a strong discontinuity at 50 percent. The estimated

Figure 2: Histogram of the share of income earned by the wife in Western Germany, 1984-2012



Notes: N=7,870

Figure 3: McCary test for the share of income earned by the wife in Western Germany, 1984-2012



Notes: N=7,870

dicontinuity, $\hat{\theta}$, amounts to -0.91 (Figure 3). The p-value is smaller than 0.001 and the Null Hypothesis of no sorting is rejected. The distribution of relative income drops by 60 percent at the 50 percent benchmark.

The distribution in Eastern Germany for the years 1991 to 2012 looks more symmetric than in Western Germany, there are fewer observations where the share of income earned by the wife is relatively small (Figure 4). The histogram also exhibits a sharp drop at 0.5 and the wife's income exceeds that of the husband in only 27.3 percent of the obervations. The estimated discontinuity $\hat{\theta}$ takes the value -0.57 ($p<0.001$), so the distribution of relative income drops by 44 percent at 0.5 (Figure 5).

The estimate for the drop in the distribution of relative income is about one third higher in Western Germany than in Eastern Germany, what corresponds to the higher agreement to traditional gender roles in Western Germany (see Figure 1 in chapter 2.2). On the other hand, the higher drop in Western Germany might be due to differences in the labor supply in Eastern and Western Germany. Figure 6 shows that only 38.1 percent of Western German wives but almost two thirds of Eastern German wives in the sample work full time. So the next step is to compare the distribution of relative income of full time working couples to see if the drop remains higher in Western Germany.

Figures 7 and 8 show the histogram of the distribution of relative income for full time working couples in Western Germany from 1984 to 2012 and Eastern Germany from 1991 to 2012. Even though the two distributions now look more similar left to the 50 percent benchmark, the drop in the distribution at 0.5 for the Western German sample is still more sharp than for the Eastern German sample. The results of the McCrary test are presented in Figure 9 for Western Germany and 10 for Eastern Germany. The Null Hypothesis of no sorting is still rejected in both cases and the magnitudes of $\hat{\theta}$ remain in the same ranges. The distribution drops by 59 percent in Western Germany and 44 percent in Eastern Germany.

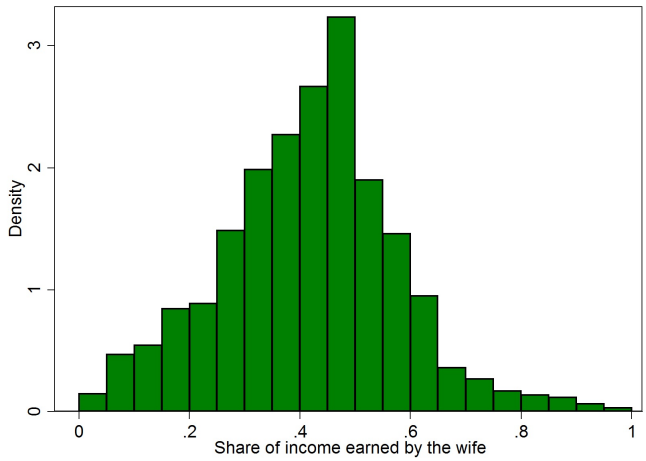
For full time working couples, $\hat{\theta}$ remains larger in Western Germany than in Eastern Germany. Next, a two sample t-test is constructed to test if $\hat{\theta}$ is significantly larger in Western Germany than in Eastern Germany.

$$H_0 : \hat{\theta}_{West} - \hat{\theta}_{East} = 0 \qquad vs. \qquad H_1 : \hat{\theta}_{West} - \hat{\theta}_{East} > 0 \tag{4}$$

The Null Hypothesis is rejected for full time working couples ($p<0.05$). The drop in the distribution of relative income at the 50 percent benchmark is significantly higher in Western Germany than in Eastern Germany.

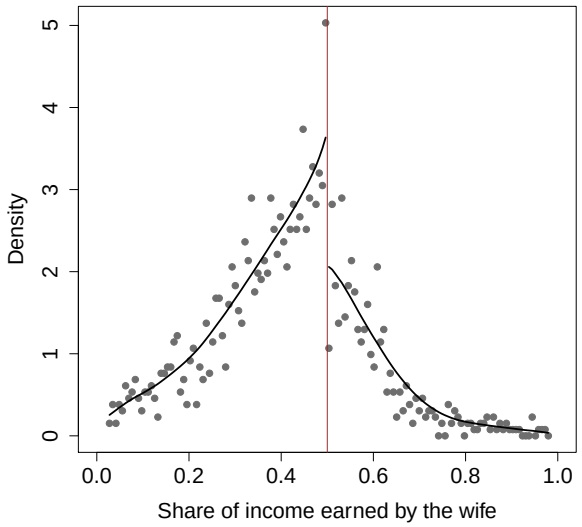
Bertrand et al. (2015) conclude from the sharp drop in the distribution of relative

Figure 4: Histogram of the share of income earned by the wife in Eastern Germany, 1991-2012



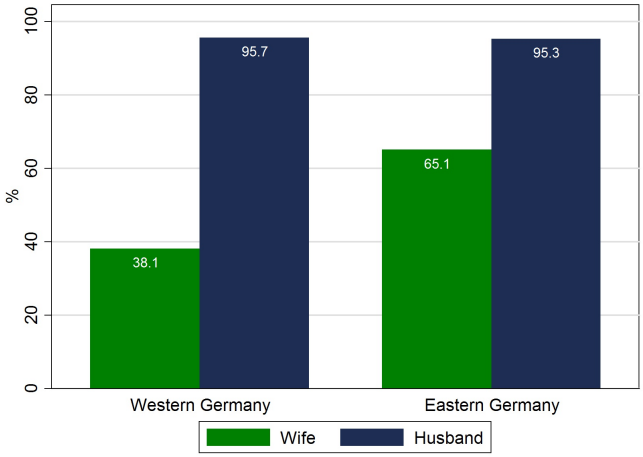
Notes: N=1,874

Figure 5: McCary test for the share of income earned by the wife in Eastern Germany, 1991-2012



Notes: N=1,874

Figure 6: Share of full time working wives and husbands conditional on both spouses working in Western Germany (1984-2012) and Eastern Germany (1991-2012)



Notes: N=7,870 (Western Germany) and N=1,874 (Eastern Germany)

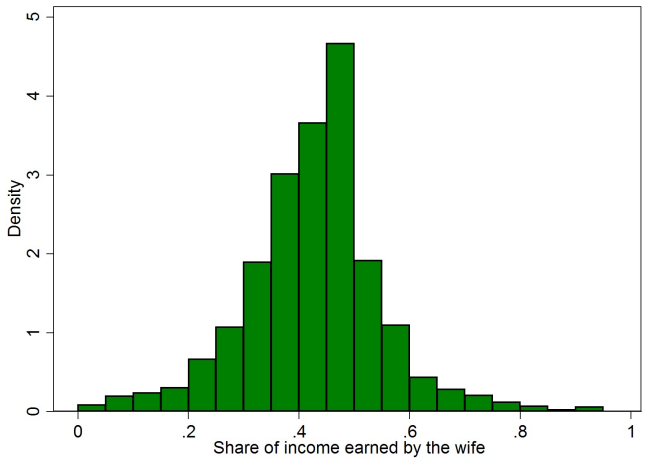
income in the USA that couples try to avoid circumstances where the wife would earn more than her husband, as standard economic models don't predict the observed discontinuity.

3.2 Labor supply and relative income

One potential reason for the sharp drop in relative income is that wives distort their labor supply in order not to violate gender identity norms. A wife can achieve that, for example, by leaving the labor force. Bertrand et al. (2015) report that an increase of the probability that the wife earns more than her husband by ten percentage points lowers the likelihood that she participates in the labor force by 1.4 percentage points. When the wife leaves the labor force, the couple forgoes the entire income earned by the wife, so a reduction of the wife's earnings is a less costly way to restore traditional gender roles. For example, the wife could take a job that pays less than her potential or work fewer hours. The results of Bertrand et al. (2015) show that a ten percentage point increase in the probability that the wife earns more increases the gap between the wife's actual and potential income by 1 percentage point.

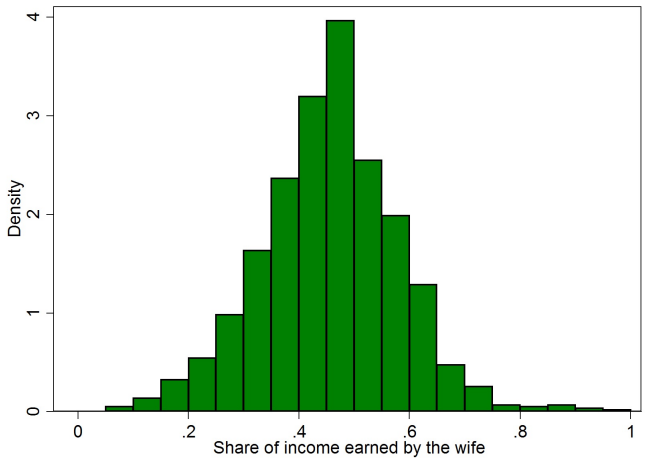
Do these effects apply to Germany as well? At first, the correlation between a constructed variable that is used as a proxy for the probability that the wife earns more than her husband and the wife's labor force participation and the wife's income gap are estimated using pooled Ordinary Least Squares (OLS) in order to

Figure 7: Histogram of the share of income earned by the wife of full time working couples in Western Germany, 1984-2012



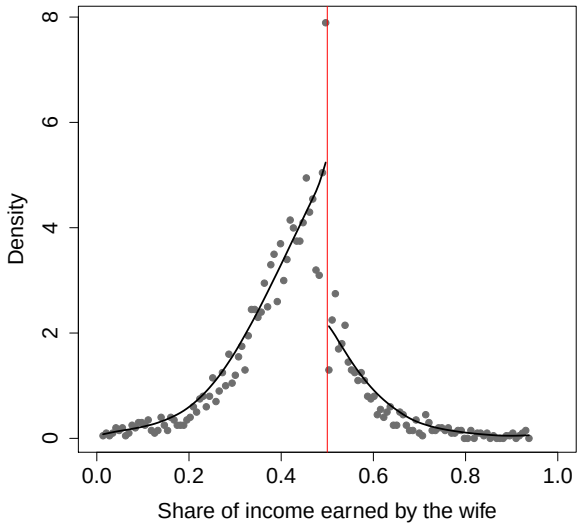
Notes: N=2,860

Figure 8: Histogram of the share of income earned by the wife of full time working couples in Eastern Germany, 1991-2012



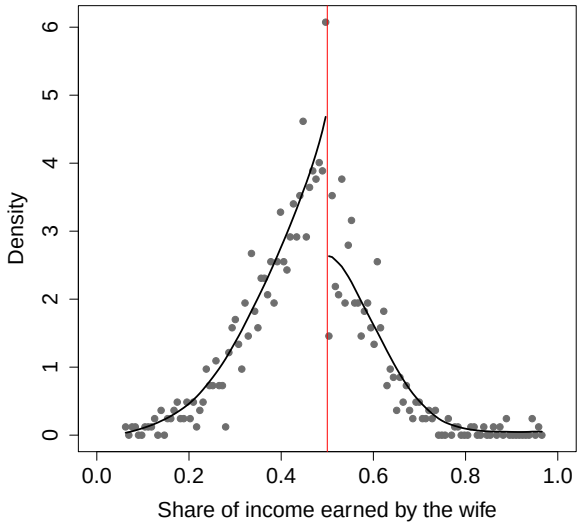
Notes: N=1,176

Figure 9: McCary test for the share of income earned by the wife of full time working couples in Western Germany, 1984-2012



Notes: N=2,860

Figure 10: McCary test for the share of income earned by the wife of full time working couples in Eastern Germany, 1991-2012



Notes: N=1,176

stick closely to the the study of Bertrand et al. (2015). One major concern is that *PrWifeEarnsMore* might be endogenous, so individual fixed effects are included into the econometric models to control for time constant unobserved heterogeneity. Bertrand et al. (2015) have further expanded their fixed effects model dynamically by adding a binary variable that indicates whether the wife earned more last year. The sample for the analysis of labor supply and relative income is restricted to married women. Then, only observations are kept where the wife and the husband are between twenty-five and sixty-four years old, where neither the wife nor the husband is in education and where the husband is working and has a positive income.

3.2.1 Labor force participation

First, a pooled linear probability model is specified to study if wives who would earn more than their husbands would leave the labor force:

$$wifeLFP_{it} = \alpha + \beta_1 PrWifeEarnsMore_{it} + \boldsymbol{\beta}_2 \mathbf{X}_{it} + \epsilon_{it} \tag{5}$$

wifeLFP is a binary variable that indicates whether the wife is working or not and *PrWifeEarnsMore* is a constructed variable that measures the probability that the wife earns more than her husband if her income was a random draw from the population of working women in the wife's demographic group which is based on Bertrand et al. (2015). This variable is calculated by dividing all women in the data set into demographic groups based on their education[6], age[7] and location (Eastern and Western Germany). For each demographic group, the p^{th} percentile of the inflation-adjusted pre-tax income $perc_i^p$ of working women in that demographic group is calculated at each $p \in \{5, 10, ..., 95\}$ and *PrWifeEarnsMore* is calculated as follows:

$$PrWifeEarnsMore_{it} = \frac{1}{19} \sum_{p=1}^{19} \mathbb{1}_{\{perc_{it}^p > iblabgro\_m_{it}\}} \tag{6}$$

$\mathbf{X}$ is a vector of control variables. The control variables are a set of dummy variables for the survey year (*syear*), the logarithm of the husband's inflation-adjusted pre-tax income (*lnlabgro_m*), dummy variables for the wife's and the husband's five-year age groups (*agegr5* and *agegr5_m*), a set of dummy variables for the wife's

[6] Using the International Standard Classification of Education (ISCED) classification, education groups are defined as "lower education" (ISCED groups "inadequately" and "general elementary"), "medium education" (ISCED groups "middle vocational" and "vocational + Abitur") and "higher education" (ISCED groups "higher vocational" and "higher education").

[7] Age groups are defined as ten year intervals ("25 to 34", "35 to 44", "45 to 54" and "55 to 64").

and the husband's education group (*isced* and *isced_m*) and the 5-, 25-, 50-, 75- and 95-percentile of inflation-adjusted pre-tax income in the wife's demographic group (*perc1*, *perc5*, *perc10*, *perc15* and *perc19*). Bertrand et al. (2015) further include variables for the wife's and the husband's race and state fixed effects as control variables. We don't include state fixed effects, but we estimate different regressions for Eastern and Western Germany. Also, we use panel robust standard errors throughout chapter 3.2 and 3.3 for inference to account for the panel structure of the SOEP.

We also specify a linear probability model for the wife's labor force participation. $\hat{\beta}_1$ measures the predicted change in the probability that the wife participates in the labor force when *PrWifeEarnsMore* changes by one unit, holding the other variables fixed[8].

Tables 1 and 2 provide the results for $\hat{\beta}_1$ of the pooled OLS estimation for the wives' labor force participation in Western and Eastern Germany. The tables are restricted to the presentation of $\hat{\beta}_1$ and the control variables are added stepwise. Due to the way *PrWifeEarnsMore* is constructed, its value naturally depends on the husband's income and the wife's affiliation to a demographic group. When no other variables are included, $\hat{\beta}_1$ amounts to 0.188 ($p < 0.001$) in Western Germany and 0.071 ($p < 0.01$) in Eastern Germany. In Models 2 and 3, variables for the survey year and the logarithm of the husband's income are added and $\hat{\beta}_1$ further increases and stays statistically significant in Western and Eastern Germany. In the baseline model, when dummy variables for the wife's and the husband's age group and education group and the percentiles of income in the wife's demographic group are added, $\hat{\beta}_1$ decreases to 0.060 in Western Germany and 0.044 in Eastern Germany and becomes statistically insignificant. That means that the first part of Hypothesis 1 can not be supported in the baseline model.

Bertrand et al. (2015) check the robustness of their results by adding a variable that indicates whether there are children present, a cubic polynomial of the husband's income and an interaction between the husband's income and the median of inflation-adjusted pre-tax income of working women in the wife's demographic group. We do the same. Model 7 includes a set of dummy variables that indicates the age of the wife's youngest child in the household, *agekidk*, with the base category "no children". In Model 8, the cubic polynomial of the logarithm of the husband's inflation-adjusted

[8] A drawback of the linear probability model is that the predicted probability that the wife participates in the labor force can take negative values or values that are larger than one. So if the aim is in prediction, one should rather use a nonlinear binary response model, as the logit or the probit model. Here, interest is not in prediction, but in marginal effects and the linear probability model provides a good estimate of the marginal effects near the average of the covariates (Wooldridge, 2002, p. 469).

Table 1: Results from the pooled OLS regression for the dependent variable *wifeLFP* in Western Germany, 1984-2012

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
PrWifeEarnsMore	0.188***	0.196***	0.323***	0.091*	0.070	0.060	0.046	-0.009	0.008	
	(0.019)	(0.019)	(0.033)	(0.039)	(0.039)	(0.039)	(0.038)	(0.047)	(0.046)	
PrWifeEarnsMore_cat2										-0.008
										(0.010)
PrWifeEarnsMore_cat3										-0.014
										(0.019)
PrWifeEarnsMore_cat4										-0.058
										(0.036)
Observations	69,224	69,224	69,224	69,224	69,224	69,224	69,224	69,224	69,224	69,224
R-squared	0.005	0.037	0.038	0.049	0.079	0.082	0.163	0.163	0.163	0.163
Number of pid	10,354	10,354	10,354	10,354	10,354	10,354	10,354	10,354	10,354	10,354
Adjusted R-squared	0.00512	0.0364	0.0380	0.0485	0.0786	0.0807	0.162	0.162	0.162	0.163
Year Dummies		YES	YES	YES	YES	YES	YES	YES	YES	YES
lnlabgro_m			YES	YES	YES	YES	YES	YES	YES	YES
isced and isced_m				YES	YES	YES	YES	YES	YES	YES
agegr5 and agegr5_m					YES	YES	YES	YES	YES	YES
percentiles						YES	YES	YES	YES	YES
agekidk							YES	YES	YES	YES
lnlabgro_m2 and lnlabgro_m3								YES	YES	YES
perclabgro_m									YES	YES

Notes: Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

Table 2: Results from the pooled OLS regression for the dependent variable *wifeLFP* in Eastern Germany, 1991-2012

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
PrWifeEarnsMore	0.071**	0.079**	0.416***	0.176***	0.071	0.044	0.063	0.085	0.061	
	(0.024)	(0.025)	(0.037)	(0.045)	(0.047)	(0.046)	(0.043)	(0.056)	(0.056)	
PrWifeEarnsMore_cat2										0.008
										(0.016)
PrWifeEarnsMore_cat3										0.009
										(0.022)
PrWifeEarnsMore_cat4										0.023
										(0.031)
Observations	15,649	15,649	15,649	15,649	15,649	15,649	15,649	15,649	15,649	15,649
R-squared	0.002	0.011	0.043	0.059	0.108	0.111	0.181	0.181	0.182	0.182
Number of pid	2,424	2,424	2,424	2,424	2,424	2,424	2,424	2,424	2,424	2,424
Adjusted R-squared	0.00214	0.00913	0.0416	0.0570	0.106	0.108	0.179	0.178	0.179	0.179
Year Dummies		YES	YES	YES	YES	YES	YES	YES	YES	YES
lnlabgro_m			YES	YES	YES	YES	YES	YES	YES	YES
isced and isced_m				YES	YES	YES	YES	YES	YES	YES
agegr5 and agegr5_m					YES	YES	YES	YES	YES	YES
percentiles						YES	YES	YES	YES	YES
agekidk							YES	YES	YES	YES
lnlabgro_m2 and lnlabgro_m3								YES	YES	YES
perclabgro_m									YES	YES

Notes:Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

pre-tax income is added (*lnlabgro_m2* and *lnlabgro_m3*) because the wife's labor force participation might depend on the logarithm of the husband's income in a non-linear way. Model 9 further includes an interaction term between the logarithm of the husband's inflation adjusted pre-tax income and the median of the inflation-adjustes pre-tax income in the wife's demographic group (*perclabgro_m*). $\hat{\beta}_1$ stays close to zero and insignificant both in Western and Eastern Germany.
The wife's labor force participation might depend on *PrWifeEarnsMore* in a non-linear way. So the dummy variables *PrWifeEarnsMore_cat2*, *PrWifeEarnsMore_cat3* and *PrWifeEarnsMore_cat4* are included into the regression instead of *PrWifeEarns-More* in Model 10 in Table 1 and 2. The dummy variables are defined as follows:

$$PrWifeEarnsMore\_cat2 = \begin{cases} 1 & \text{, if } 0.25 < PrWifeEarnsMore \leq 0.5 \\ 0 & \text{, else} \end{cases} \tag{7}$$

$$PrWifeEarnsMore\_cat3 = \begin{cases} 1 & \text{, if } 0.5 < PrWifeEarnsMore \leq 0.75 \\ 0 & \text{, else} \end{cases} \tag{8}$$

and

$$PrWifeEarnsMore\_cat4 = \begin{cases} 1 & \text{, if } 0.75 < PrWifeEarnsMore \leq 1 \\ 0 & \text{, else} \end{cases} \tag{9}$$

In Eastern Germany, the estimated regression coefficients take small positive and in Western Germany small negative values that are not statistically significant. The results of the OLS regression do not indicate that women who would earn more than their husbands leave the labor force in Germany.

3.2.2 Gap between potential and realized income

As leaving the labor force is very costly, wives who would earn more than their husbands might rather reduce their income to re-install traditional gender roles. Like in Bertrand et al. (2015), the following baseline OLS specification is used to study if a woman who would earn more than her husband under-performs on the labor market:

$$incomeGap_{it} = \alpha + \beta_1 PrWifeEarnsMore_{it} + \boldsymbol{\beta}_2 \mathbf{X}_{it} + \epsilon_{it} \tag{10}$$

incomeGap is defined as the gap between the wife's actual inflation-adjusted pre-tax income and the mean inflation-adjusted pre-tax income in her demographic group

($mlabgro_{it}$):

$$incomeGap_{it} = \frac{iblabgro_{it} - mlabgro_{it}}{mlabgro_{it}} \tag{11}$$

X is the same vector of control variables as for the labor force participation but a dummy variable that indicates whether the wife's income is imputed is added as an additional variable for the robustness check (*impgro*) and we further restrict the sample to working wives.

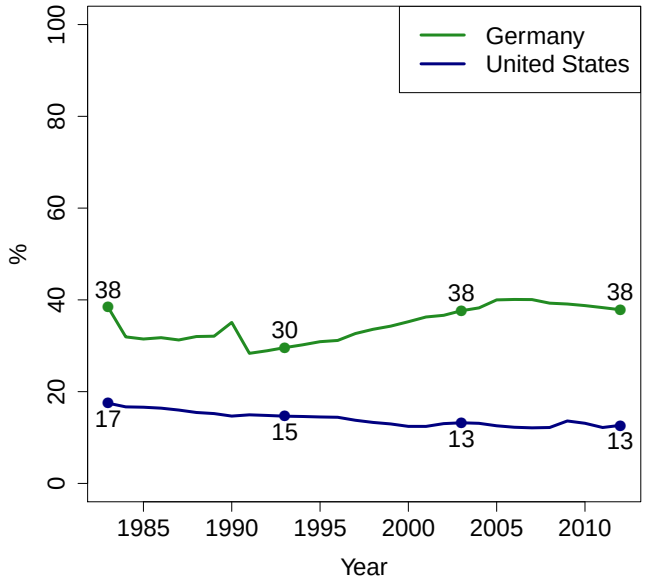
In Western Germany, $\hat{\beta}_1$ is small and insignificant until control variables for the wife's and the husband's education are included (Table 3). In the baseline model (Model 6), $\hat{\beta}_1$ amounts to 0.156 ($p < 0.05$). The positive sign of $\hat{\beta}_1$ indicates that women who have a higher probability to earn more than their husbands over-perform on the labor market what is contrary to the results of Bertrand et al. (2015) who report a negative estimate of β_1. The size of $\hat{\beta}_1$ further increases as dummy variables for the age of the wife's youngest child and a cubic polynomial of the husband's income are added as control variables but decreases to 0.099 and becomes insignificant in the full model (Model 10). In Model 11, the categorical variables for *PrWifeEarnsMore* are used instead. The estimate of the regression coefficient for *PrWifeEarnsMore_cat4* is 0.242 ($p < 0.01$) and the estimates of the regression coefficients of *PrWifeEarnsMore_cat2* and *PrWifeEarnsMore_cat3* are small and insignificant. These results are contradictory to Hypothesis 1b. Especially the results from Model 11 suggest that women who have a high probability to earn more than their husbands have an income above their potential.

In Eastern Germany, $\hat{\beta}_1$ takes a negative sign in all models, so women with a high probability to earn more than their husbands earn less than their potential income (Table 4). When no control variables are included, $\hat{\beta}_1$ is -0.366 ($p < 0.001$) but decreases to -0.058 and becomes insignificant in the baseline model (Model 6). The estimate of β_1 increases to -0.173 in the full model (Model 10) but remains insignificant.

To sum up: in Eastern Germany, the results are similar to Bertrand et al. (2015), but not statistically significant, whereas in Western Germany, the results are contrary to Bertrand et al. (2015).

One potential reason for the opposing results in Western Germany could be differences in culture and the labor market composition for women in Germany and the USA. Figure 11 provides an overview of the ratio of part time employment among women in the USA and Germany for the years 1983 until 2012. The figure illustrates that 38 percent of German women worked part time in 2012 opposed to only

Figure 11: Share of part time employed women in Germany and the USA, 1983-2012



Source: OECD database, own illustration.

Table 3: Results from the pooled OLS regression for the dependent variable *incomeGap* in Western Germany, 1984-2012

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11
PrWifeEarnsMore	-0.035	-0.021	0.005	0.170*	0.146	0.156*	0.177*	0.189*	0.096	0.099	
	(0.039)	(0.039)	(0.064)	(0.074)	(0.075)	(0.075)	(0.074)	(0.095)	(0.090)	(0.090)	
PrWifeEarnsMore_cat2											0.007
											(0.018)
PrWifeEarnsMore_cat3											0.057
											(0.036)
PrWifeEarnsMore_cat4											0.242**
											(0.082)
Observations	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500
R-squared	0.000	0.003	0.003	0.031	0.034	0.034	0.078	0.078	0.079	0.079	0.080
Number of pid	7,777	7,777	7,777	7,777	7,777	7,777	7,777	7,777	7,777	7,777	7,777
Adjusted R-squared	8.38e-05	0.00261	0.00262	0.0302	0.0327	0.0331	0.0769	0.0771	0.0777	0.0779	0.0785
Year Dummies		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
lnlabgro_m			YES	YES	YES	YES	YES	YES	YES	YES	YES
isced and isced_m				YES	YES	YES	YES	YES	YES	YES	YES
agegr5 and agegr5_m					YES	YES	YES	YES	YES	YES	YES
percentiles						YES	YES	YES	YES	YES	YES
agekidk							YES	YES	YES	YES	YES
lnlabgro_m2 and lnlabgro_m3								YES	YES	YES	YES
perclabgro_m									YES	YES	YES
impgro										YES	YES

Notes: Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

Table 4: Results from the pooled OLS regression for the dependent variable *incomeGap* in Eastern Germany, 1991-2012

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11
PrWifeEarnsMore	-0.366***	-0.299***	-0.243***	-0.076	-0.058	-0.058	-0.058	-0.137	-0.171	-0.173	
	(0.040)	(0.041)	(0.067)	(0.082)	(0.094)	(0.095)	(0.095)	(0.136)	(0.139)	(0.139)	
PrWifeEarnsMore_cat2											-0.059
											(0.036)
PrWifeEarnsMore_cat3											-0.086
											(0.054)
PrWifeEarnsMore_cat4											-0.144
											(0.075)
Observations	12,048	12,048	12,048	12,048	12,048	12,048	12,048	12,048	12,048	12,048	12,048
R-squared	0.034	0.058	0.058	0.085	0.089	0.090	0.093	0.094	0.095	0.095	0.096
Number of pid	2,069	2,069	2,069	2,069	2,069	2,069	2,069	2,069	2,069	2,069	2,069
Adjusted R-squared	0.0335	0.0562	0.0566	0.0822	0.0850	0.0861	0.0887	0.0899	0.0903	0.0908	0.0913
Year Dummies		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
lnlabgro_m			YES	YES	YES	YES	YES	YES	YES	YES	YES
isced and isced_m				YES	YES	YES	YES	YES	YES	YES	YES
agegr5 and agegr5_m					YES	YES	YES	YES	YES	YES	YES
percentiles						YES	YES	YES	YES	YES	YES
agekidk							YES	YES	YES	YES	YES
lnlabgro_m2 and lnlabgro_m3								YES	YES	YES	YES
perclabgro_m									YES	YES	YES
impgro										YES	YES

Notes: Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

13 percent of women in the USA. Across all years, the share of part time working women is almost twice as high in Germany as in the USA. Figure 6 in chapter 3.1 already showed that the share of full time working wives if both partners are in the labor force is much lower in Western Germany than in Eastern Germany.
As the variable *PrWifeEarnsMore* is based on all working women in the demographic groups, the probability that the wife earns more is comparatively low in Western Germany because it is based on income from part time work to a large proportion. In general one would expect that, the potential income for a full time job is higher than for a part time job. So if a full time working woman stayed below the potential income she could earn in a full time job, she would probably still be an over-performer if her potential is defined as the mean of all working women in her demographic group.
In terms of the economic framework presented in chapter 2.2 it is rational that women who have a relatively low potential income compared to their husbands specialize in housework and that their labor supply would be zero or very small. Women with a potential income more similar to that of their partners might rather choose to work full time as leaving the labor force or working part time means that the couple forgoes a high proportion of mutual income. In case she would earn more than her husband, she could also distort her income from full time work.
So in the following, the sample is further restricted to couples where both partners work full time. The baseline OLS specification from equation 10 is adapted to full time working women:

$$incomeGapVZ_{it} = \alpha + \beta_1 PrWifeEarnsMoreVZ_{it} + \boldsymbol{\beta}_2 \mathbf{X}_{it} + \epsilon_{it} \qquad (12)$$

incomeGapVZ measures the gap between the wife's income and the mean income of full time working women in her demographic group and *PrWifeEarnsMoreVZ* is the probability that the wife earns more than her husband if her income was a random draw from the income of full time working women in her demographic group. The vector $\mathbf{X}$ still contains the same set of control variables, except that the percentiles of the distribution of inflation-adjusted pre-tax income of full time working women is now used (*percVZ1*, *percVZ5*, *percVZ10*, *percVZ15* and *percVZ19*).
Tables 5 and 6 provide the results of the OLS estimation for the income gap of full time working wives in Western and Eastern Germany. $\hat{\beta}_1$ takes the expected negative sign throughout all the models in Western and Eastern Germany. Without the inclusion of any control variables, $\hat{\beta}_1$ is -0.401 ($p < 0.001$) in Western Germany and -0.496 ($p < 0.001$) in Eastern Germany. $\hat{\beta}_1$ decreases in absolute size when the control variables for the baseline model (Model 6) are added. In Western Ger-

Table 5: Results from the pooled OLS regression for the dependent variable *incomeGapVZ* of full time working couples in Western Germany, 1984-2012

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11
PrWifeEarnsMoreVZ	-0.401***	-0.371***	-0.332***	-0.213***	-0.138*	-0.126*	-0.123*	-0.065	-0.077	-0.074	
	(0.032)	(0.032)	(0.043)	(0.048)	(0.053)	(0.054)	(0.054)	(0.067)	(0.065)	(0.066)	
PrWifeEarnsMoreVZ_cat2											-0.028
											(0.018)
PrWifeEarnsMoreVZ_cat3											-0.035
											(0.027)
PrWifeEarnsMoreVZ_cat4											-0.028
											(0.040)
Observations	15,661	15,661	15,661	15,661	15,661	15,661	15,661	15,661	15,661	15,661	15,661
R-squared	0.051	0.080	0.081	0.102	0.108	0.110	0.113	0.115	0.117	0.119	0.120
Number of pid	3,818	3,818	3,818	3,818	3,818	3,818	3,818	3,818	3,818	3,818	3,818
Adjusted R-squared	0.0509	0.0787	0.0790	0.0999	0.105	0.107	0.109	0.112	0.114	0.116	0.116
Year Dummies		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
lnlabgro_m			YES	YES	YES	YES	YES	YES	YES	YES	YES
isced and isced_m				YES	YES	YES	YES	YES	YES	YES	YES
agegr5 and agegr5_m					YES	YES	YES	YES	YES	YES	YES
percentiles						YES	YES	YES	YES	YES	YES
agekidk							YES	YES	YES	YES	YES
lnlabgro_m2 and lnlabgro_m3								YES	YES	YES	YES
percVZlabgro_m									YES	YES	YES
impgro										YES	YES

Notes: Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

Table 6: Results from the pooled OLS regression for the dependent variable *incomeGapVZ* of full time working couples in Eastern Germany, 1991-2012

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11
PrWifeEarnsMoreVZ	-0.496***	-0.406***	-0.333***	-0.217**	-0.138	-0.125	-0.125	-0.100	-0.106	-0.109	
	(0.038)	(0.039)	(0.070)	(0.083)	(0.096)	(0.098)	(0.098)	(0.118)	(0.115)	(0.115)	
PrWifeEarnsMoreVZ_cat2											-0.034
											(0.026)
PrWifeEarnsMoreVZ_cat3											-0.056
											(0.041)
PrWifeEarnsMoreVZ_cat4											-0.116*
											(0.052)
Observations	7,933	7,933	7,933	7,933	7,933	7,933	7,933	7,933	7,933	7,933	7,933
R-squared	0.095	0.140	0.141	0.165	0.174	0.176	0.176	0.181	0.182	0.183	0.184
Number of pid	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Adjusted R-squared	0.0947	0.137	0.138	0.162	0.169	0.171	0.170	0.175	0.176	0.177	0.178
Year Dummies		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
lnlabgro_m			YES	YES	YES	YES	YES	YES	YES	YES	YES
isced and isced_m				YES	YES	YES	YES	YES	YES	YES	YES
agegr5 and agegr5_m					YES	YES	YES	YES	YES	YES	YES
percentiles						YES	YES	YES	YES	YES	YES
agekidk							YES	YES	YES	YES	YES
lnlabgro_m2 and lnlabgro_m3								YES	YES	YES	YES
percVZlabgro_m									YES	YES	YES
impgro										YES	YES

Notes: Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

many, $\hat{\beta}_1$ is -0.126 ($p < 0.05$) in the baseline model, so full time working women under-perform in the labor market if their husband's identity of the breadwinner is threatened. Specifically, an increase in the probability that the wife earns more by 10 percentage points increases the gap between the wife's income and her potential by 1.26 percentage points, given her income is under her potential. When further control variables for the age of the wife's youngest child and the cubic polynomial of the logarithm of the husband's income are included, $\hat{\beta}_1$ becomes smaller and insignificant. In the full model (Model 10), $\hat{\beta}_1$ is -0.074. In Eastern Germany, $\hat{\beta}_1$ amounts to -0.125 in the baseline model (Model 6) and further decreases in absolute size to -0.109 in the full model (Model 10) and is not statistically significant. When dummy variables for *PrWifeEarnsMoreVZ* are used, the estimates of regression coefficients remain small, negative and statistically insignificant in Western Germany. In Eastern Germany, there is a statistically significant negative effect for *PrWifeEarnsMoreVZ_cat4*. When the probability that the wife earns more increases from 0-25 percent to 75-100 percent, the gap between the wife's potential and her actual income increases by 11.6 percentage points given the wife is below her potential.

3.2.3 Fixed Effects

A major concern of Bertrand et al. (2015) is that *PrWifeEarnsMore* is endogenous. They suppose that women who marry a man with an income below her own potential might be systematic underachievers on the labor market or they might have a higher preference for non-market work. In order to isolate the variation in *PrWifeEarnsMore* that happened after they got married, Bertrand et al. (2015) construct a variable that estimates the probability that the wife earned more at the marriage and using panel data they further added couple fixed effects and a lag of a binary variable that indicates if the wife earned more last year. As the SOEP is a panel data set, we can control for time constant unobserved heterogeneity using Fixed Effects (FE) regression, too.

3.2.3.1 Labor force participation

First, the following linear probability FE model for the wife's labor force participation is specified:

$$wifeLFP_{it} = \alpha_i + \beta_1 PrWifeEarnsMore_{it} + \boldsymbol{\beta}_2 \mathbf{X}_{it} + \epsilon_{it} \tag{13}$$

X is the same vector of control variables as in chapter 3.2.1 only that the set of dummy variables for the wife's and husband's education group are left out because there is only very little within variation.
There is no statistically significant effect of the probability that the wife earns more on her labor force participation in the baseline model (Model 5) in Western and Eastern Germany (Table 7 and 8). In Western Germany, $\hat{\beta}_1$ is 0.036 in Model 1 and increases to 0.069 ($p < 0.05$) when dummy variables for the survey year and the variable *lnlabgro_m* are added. In the baseline model (Model 5), $\hat{\beta}_1$ decreases to 0.041 and is not statistically significant. $\hat{\beta}_1$ remains statistically insignificant and further decreases when *agekid_k*, the cubic polynomial of the logarithm of the husband's income and the interaction between the median of inflation-adjusted income in the wife's demographic group and the husband's income are added.
In Eastern Germany, the results are similar. $\hat{\beta}_1$ takes the value 0.45 in the baseline model (Model 5) and remains statistically insignificant in Models 6 to 9.
When dummy variables for the probability that the wife earns more are used instead, the regression coefficients remain small and statistically insignificant in Western and Eastern Germany.
So again, the hypothesis that women who would earn more than their husbands would leave the labor force (Hypothesis 1b) can not be supported by the results of the FE model, neither for Western nor for Eastern Germany.

3.2.3.2 Gap between potential and realized income

Next, the analysis of the gap between potential and realized income is extended by adding FE to the linear model for all working wives:

$$incomeGap_{it} = \alpha_i + \beta_1 PrWifeEarnsMore_{it} + \boldsymbol{\beta}_2 \mathbf{X}_{it} + \epsilon_{it} \tag{14}$$

X is still the same vector of control variables and an imputation flag for the wife's income is used as an additional variable for the robustness check (*impgro*).
For Western Germany, $\hat{\beta}_1$ is negative throughout all the models (Table 9). That is in contrast to the results from the OLS regression in chapter 3.2.2 and strengthens the concern that *PrWifeEarnsMore* in the OLS specification might have been endogenous. $\hat{\beta}_1$ is negative and statistically significant as long as no control variables for the percentiles of inflation-adjusted pre-tax income in the wife's demographic group are included. In the baseline model (Model 5) $\hat{\beta}_1$ is -0.085 and further decreases to -0.077 in the full model (Model 9).

Table 7: Results from the FE regression for the dependent variable *wifeLFP* in Western Germany, 1984-2012

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
PrWifeEarnsMore	0.036	0.040*	0.069*	0.049	0.041	0.012	0.012	0.022	
	(0.020)	(0.020)	(0.035)	(0.035)	(0.035)	(0.032)	(0.040)	(0.040)	
PrWifeEarnsMore_cat2									-0.008
									(0.007)
PrWifeEarnsMore_cat3									0.005
									(0.015)
PrWifeEarnsMore_cat4									-0.006
									(0.028)
Observations	69,224	69,224	69,224	69,224	69,224	69,224	69,224	69,224	69,224
R-squared	0.000	0.021	0.021	0.050	0.050	0.133	0.133	0.133	0.133
Number of pid	10,354	10,354	10,354	10,354	10,354	10,354	10,354	10,354	10,354
Adjusted R-squared	0.000123	0.0202	0.0203	0.0489	0.0497	0.133	0.133	0.133	0.133
Year Dummies		YES	YES	YES	YES	YES	YES	YES	YES
lnlabgro_m			YES	YES	YES	YES	YES	YES	YES
agegr5 and agegr5_m				YES	YES	YES	YES	YES	YES
percentiles					YES	YES	YES	YES	YES
agekidk						YES	YES	YES	YES
lnlabgro_m2 and lnlabgro_m3							YES	YES	YES
perclabgro_m								YES	YES

Notes: Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

Table 8: Results from the FE regression for the dependent variable *wifeLFP* in Eastern Germany, 1991-2012

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
PrWifeEarnsMore	0.084***	0.043	0.169***	0.074*	0.045	0.050	0.059	0.063	
	(0.023)	(0.024)	(0.036)	(0.034)	(0.036)	(0.035)	(0.048)	(0.048)	
PrWifeEarnsMore_cat2									0.009
									(0.011)
PrWifeEarnsMore_cat3									0.019
									(0.017)
PrWifeEarnsMore_cat4									0.038
									(0.024)
Observations	15,649	15,649	15,649	15,649	15,649	15,649	15,649	15,649	15,649
R-squared	0.002	0.011	0.013	0.051	0.053	0.109	0.109	0.109	0.109
Number of pid	2,424	2,424	2,424	2,424	2,424	2,424	2,424	2,424	2,424
Adjusted R-squared	0.00185	0.00972	0.0117	0.0489	0.0508	0.106	0.106	0.106	0.106
Year Dummies		YES	YES	YES	YES	YES	YES	YES	YES
lnlabgro_m			YES	YES	YES	YES	YES	YES	YES
agegr5 and agegr5_m				YES	YES	YES	YES	YES	YES
percentiles					YES	YES	YES	YES	YES
agekidk						YES	YES	YES	YES
lnlabgro_m2 and lnlabgro_m3							YES	YES	YES
perclabgro_m								YES	YES

Notes: Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

Table 9: Results from the FE regression for the dependent variable *incomeGap* in Western Germany, 1984-2012

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
PrWifeEarnsMore	-0.088**	-0.060	-0.339***	-0.349***	-0.085	-0.089	-0.099	-0.072	-0.077	
	(0.033)	(0.033)	(0.057)	(0.057)	(0.049)	(0.048)	(0.058)	(0.055)	(0.055)	
PrWifeEarnsMore_cat2										-0.021*
										(0.009)
PrWifeEarnsMore_cat3										0.001
										(0.019)
PrWifeEarnsMore_cat4										0.026
										(0.042)
Observations	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500
R-squared	0.001	0.016	0.020	0.026	0.045	0.078	0.078	0.079	0.083	0.084
Number of pid	7,777	7,777	7,777	7,777	7,777	7,777	7,777	7,777	7,777	7,777
Adjusted R-squared	0.000791	0.0149	0.0188	0.0254	0.0437	0.0770	0.0772	0.0777	0.0822	0.0824
Year Dummies		YES	YES	YES	YES	YES	YES	YES	YES	YES
lnlabgro_m			YES	YES	YES	YES	YES	YES	YES	YES
agegr5 and agegr5_m				YES	YES	YES	YES	YES	YES	YES
percentiles					YES	YES	YES	YES	YES	YES
agekidk						YES	YES	YES	YES	YES
lnlabgro_m2 and lnlabgro_m3							YES	YES	YES	YES
perclabgro_m								YES	YES	YES
impgro									YES	YES

Notes: Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

Table 10: Results from the FE regression for the dependent variable *incomeGap* in Eastern Germany, 1991-2012

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
PrWifeEarnsMore	-0.288***	-0.193***	-0.294***	-0.247***	-0.011	-0.010	0.004	0.007	0.009	
	(0.028)	(0.028)	(0.053)	(0.055)	(0.047)	(0.047)	(0.065)	(0.065)	(0.065)	
PrWifeEarnsMore_cat2										-0.019
										(0.014)
PrWifeEarnsMore_cat3										-0.008
										(0.021)
PrWifeEarnsMore_cat4										-0.010
										(0.029)
Observations	12,048	12,048	12,048	12,048	12,048	12,048	12,048	12,048	12,048	12,048
R-squared	0.019	0.058	0.059	0.068	0.091	0.097	0.097	0.097	0.098	0.098
Number of pid	2,069	2,069	2,069	2,069	2,069	2,069	2,069	2,069	2,069	2,069
Adjusted R-squared	0.0191	0.0560	0.0572	0.0650	0.0882	0.0933	0.0935	0.0935	0.0944	0.0945
Year Dummies		YES	YES	YES	YES	YES	YES	YES	YES	YES
lnlabgro_m			YES	YES	YES	YES	YES	YES	YES	YES
agegr5 and agegr5_m				YES	YES	YES	YES	YES	YES	YES
percentiles					YES	YES	YES	YES	YES	YES
agekidk						YES	YES	YES	YES	YES
lnlabgro_m2 and lnlabgro_m3							YES	YES	YES	YES
perclabgro_m								YES	YES	YES
impgro									YES	YES

Notes: Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

In Eastern Germany, the development is similar (Table 10). $\hat{\beta}_1$ is negative and statistically significant before controls for the income in the wife's demographic groups are added. It then decreases to -0.011 and becomes statistically insignificant. $\hat{\beta}_1$ remains small in size and statistically insignificant throughout Models 6 to 9.
The regression coefficients remain close to zero in Eastern and Western Germany, when dummy variables for the probability that the wife earns more are used instead. Only *PrWifeEarnsMore_cat2*, the dummy variable that is one if *PrWifeEarnsMore* is between 0.25 and 0.5 is statistically significant in Western Germany but very small in size.
Summing up, the hypothesis that women distort their income can not be supported when all working wives are analyzed and a wife's potential is defined as the mean income from all working women in her demographic group.
Finally, the sample is restricted to full time working couples and the gap between the wife's realized income and her potential from full time work is analyzed with the following FE specification:

$$incomeGapVZ_{it} = \alpha_i + \beta_1 PrWifeEarnsMoreVZ_{it} + \boldsymbol{\beta}_2 \mathbf{X}_{it} + \epsilon_{it} \qquad (15)$$

Tables 11 and 12 present the results from the FE regression for the same set of control variables as before, only that percentiles of the distribution of inflation-adjusted pre-tax income from the full time working women in the wife's demographic group are used. Here, the results support the hypothesis that women distort their labor market outcome if their income exceeded that of their husband, at least for Western Germany.
In Model 1, the estimate of β_1 is -0.217 ($p < 0.001$) in Western Germany. The effect is even stronger when year dummies and the logarithm of the husband's inflation-adjusted pre-tax income is included ($\hat{\beta}_1$=-0.345 ($p < 0.001$)) and gets weaker when variables for the wife's and husband's age groups and the percentiles of income in the wife's demographic groups are controlled for. In the baseline model (Model 5), $\hat{\beta}_1$ amounts to -0.099 ($p < 0.01$). So women who would earn more than their partner systematically under-perform in the labor market and a ten percentage point increase in *PrWifeEarnsMore* increases the wife's gap between actual and potential income by 0.99 percentage points when her income is below her potential. In Models 6 to 9, the usual robustness checks are conducted. $\hat{\beta}_1$ is very stable and amounts to -0.094 ($p < 0.05$) in Model 9. The results from Model 10, where dummy variables are used instead of *PrWifeEarnsMore* to allow more flexibility further support this result. The estimate for the regression coefficient of *PrWifeEarnsMore_cat3* is -0.041 ($p < 0.05$) and that of *PrWifeEarnsMore_cat4* is -0.052 ($p < 0.05$). These

Table 11: Results from the FE regression for the dependent variable *incomeGapVZ* of full time working couples in Western Germany, 1984-2012

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
PrWifeEarnsMoreVZ	-0.217***	-0.190***	-0.345***	-0.308***	-0.099**	-0.098**	-0.094*	-0.094*	-0.094*	
	(0.031)	(0.030)	(0.051)	(0.052)	(0.038)	(0.038)	(0.046)	(0.047)	(0.047)	
PrWifeEarnsMoreVZ_cat2										-0.014
										(0.012)
PrWifeEarnsMoreVZ_cat3										-0.041*
										(0.017)
PrWifeEarnsMoreVZ_cat4										-0.052*
										(0.026)
Observations	15,661	15,661	15,661	15,661	15,661	15,661	15,661	15,661	15,661	15,661
R-squared	0.014	0.032	0.037	0.043	0.077	0.078	0.078	0.078	0.078	0.078
Number of pid	3,818	3,818	3,818	3,818	3,818	3,818	3,818	3,818	3,818	3,818
Adjusted R-squared	0.0139	0.0305	0.0354	0.0404	0.0737	0.0750	0.0749	0.0748	0.0748	0.0749
Year Dummies		YES	YES	YES	YES	YES	YES	YES	YES	YES
lnlabgro_m			YES	YES	YES	YES	YES	YES	YES	YES
agegr5 and agegr5_m				YES	YES	YES	YES	YES	YES	YES
percentiles					YES	YES	YES	YES	YES	YES
agekidk						YES	YES	YES	YES	YES
lnlabgro_m2 and lnlabgro_m3							YES	YES	YES	YES
percVZlabgro_m								YES	YES	YES
impgro									YES	YES

Notes: Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

Table 12: Results from the FE regression for the dependent variable *incomeGapVZ* of full time working couples in Eastern Germany, 1991-2012

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
PrWifeEarnsMoreVZ	-0.264***	-0.152***	-0.263***	-0.221***	-0.031	-0.030	-0.012	-0.019	-0.018	
	(0.027)	(0.026)	(0.048)	(0.049)	(0.044)	(0.044)	(0.060)	(0.061)	(0.062)	
PrWifeEarnsMoreVZ_cat2										0.010
										(0.018)
PrWifeEarnsMoreVZ_cat3										0.004
										(0.023)
PrWifeEarnsMoreVZ_cat4										0.030
										(0.031)
Observations	7,933	7,933	7,933	7,933	7,933	7,933	7,933	7,933	7,933	7,933
R-squared	0.024	0.084	0.085	0.095	0.117	0.119	0.121	0.121	0.121	0.121
Number of pid	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Adjusted R-squared	0.0234	0.0810	0.0826	0.0909	0.112	0.114	0.116	0.116	0.116	0.116
Year Dummies		YES	YES	YES	YES	YES	YES	YES	YES	YES
lnlabgro_m			YES	YES	YES	YES	YES	YES	YES	YES
agegr5 and agegr5_m				YES	YES	YES	YES	YES	YES	YES
percentiles					YES	YES	YES	YES	YES	YES
agekidk						YES	YES	YES	YES	YES
lnlabgro_m2 and lnlabgro_m3							YES	YES	YES	YES
percVZlabgro_m								YES	YES	YES
impgro									YES	YES

Notes: Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

results further support the robustness of the negative effect of the probability that the wife earns more on the gap between her actual income and her potential. When the probability that the wife earns more increases from 0-25 percent to 50-75 percent, the wife's income gap increases by 4.1 percentage points and when the probability increases to 75-100 percent the income gap increases by 5.2 percentage points, given the wife is under her potential.

In Eastern Germany, $\hat{\beta}_1$ is -0.264 ($p < 0.001$) in Model 1 and decreases in absolute size to -0.031 in the baseline model (Model 5). The hypothesis that women distort their labor supply if they earned more than their partners is not supported. This result remains stable when the usual variables for the robustness check are added and also when dummy variables are used instead of *PrWifeEarnsMore*.

Summing up, the results of the FE regression support those of Bertrand et al. (2015) but only in Western Germany and only for full time working couples. No effect of the probability that the wife earns more on her labor force participation was found, neither in Western nor in Eastern Germany. Of course, it should be noted, that the variable *PrWifeEarnsMore* could not be reproduced exactly the way it is constructed by Bertrand et al. (2015) because the sample size of the SOEP in Eastern Germany is relatively small. So the definition of the demographic groups is more broad in our analysis. This is an important aspect especially in the FE regression. For FE estimation, only the change in the variables over time for a given individual is considered. As a consequence, variation in *PrWifeEarnsMore* is either generated by a change in the husband's income or when the wife is assigned to another demographic group. Also, Bertrand et al. (2015) argue that the variable *PrWifeEanrsMore* is based on the income of working women whose income might be distorted by gender identity considerations, too. So it is likely that the wife's potential, the way it is defined for the variable *incomeGap*, is also biased by gender identity. Another limitation of *PrWifeEarnsMore* in our analysis is that the distribution of income in the demographic groups is constant over the years even though gender identity norms and the conditions for women on the labor market have probably changed over the last decades.

3.3 Non-market work and relative income

The analysis of labor supply and relative income in the previous chapter shows that full time working women remain under their potential if the probability that they earn more than their husbands increases, at least in Western Germany. Bertrand et al. (2015) investigated in a next step what kind of costs arise if a woman earns more than her husband. They found out that a reversal in traditional gender roles

increases the probability of divorce and also increases the wife's contribution to non-market work in the USA. In this chapter, we analyze if a reversal in gender roles affects the wife's supply of non-market work in Germany as well.

Previous studies have investigated the relationship between economic dependency and the the supply of housework of married couples in the USA and Germany. Brines (1994) found out that wives in the USA reduce their time for housework when they are less economically dependent on their husbands whereas husbands reduce their time for housework when they are more economically dependent on their wives. Greenstein (2000) reports that the wife's share of housework decreases when she becomes less dependent on her husband economically, but only as long as her income remains below her husband's. When the wife earns more, her share of housework goes up again. Haberkern (2007) showed that wives react stronger to a violation of traditional gender roles than husbands in Germany. Wives who become the primary breadwinner do more housework in order to emphasize their identity as a homemaker. But also, he found out that men increase their supply of non-market work when they are more economically dependent on their wives. This is confirmed by the study of Dechant et al. (2014) who report that men do relatively more housework when their wives' income exceeds their own.

The sample is again restricted to married women where both partners are between twenty-five and sixty-four years old and none of them is in education. Observations where none of the partners is in the labor force and has positive income are dropped. Also, only observations where at least one partner does a positive amount of housework are kept. Information on time use for non-market work is only surveyed every two years from 1993 on in the SOEP, so the sample is further restricted to observations from uneven survey years between 1993 and 2011.

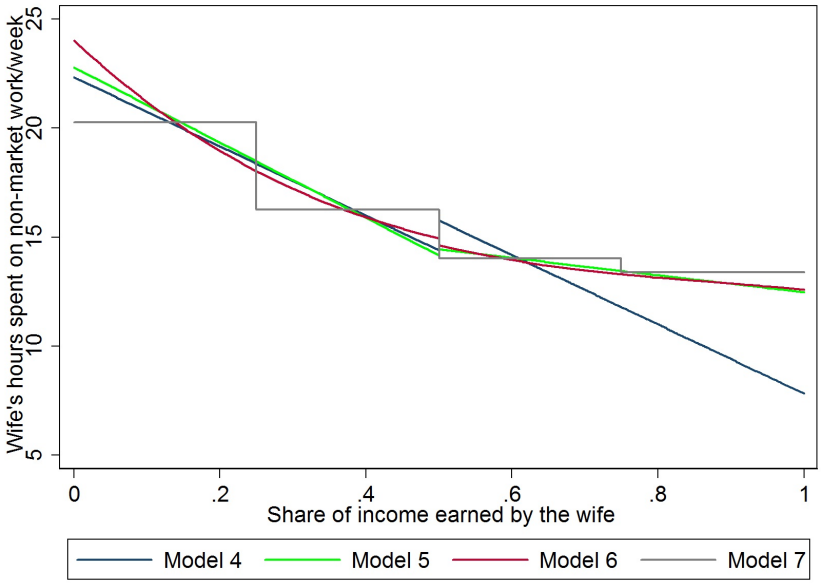
The following pooled OLS model is specified to study the effect of a reversal in gender roles on the wife's supply of non-market work:

$$NMW\_weekly_{it} = \alpha + \beta_1 wifeEarnsMore_{it} + \boldsymbol{\beta}_2 \mathbf{X}_{it} + \epsilon_{it} \tag{16}$$

wifeEarnsMore is a dummy variable that indicates if the wife earns more than her husband and *NMW_weekly* is the wife's hours of non-market work per week. Non-market work is here defined as housework (washing, cooking and cleaning) and the weekly time of non-market work is calculated as follows:

$$NMW\_weekly_{it} = 5 \times NMW\_weekday_{it} + NMW\_saturday_{it} + NMW\_sunday_{it} \tag{17}$$

Figure 12: Conditional effects plot of the share of income earned by the wife on the wife's hours spent on non-market work per week in Model 4-7 in Western Germany 1993-2011



Notes: Hours spent on non-market work are predicted for working couples in the education group "vocational training" and age group "40-44" in the survey year 2001 without children and with an inflation-adjusted pre-tax household income of 4,459 €/month (mean inflation-adjusted pre-tax income in the sample)

$NMW\_weekday$, $NMW\_saturday$ and NMW_sunday are the number of hours the wife spends on housework on a typical weekday, Saturday and Sunday.

$\mathbf{X}$ is a vector of control variables that includes a dummy variable that indicates if the wife is in the labor force (*wifeLFP*) and if the husband is in the labor force (*lfp_m*), dummy variables for the wife's and the husband's education group from the ISCED classification (*isced* and *isced_m*), dummy variables for the wife's and the husband's age group in five year intervals (*agegr5* and *agegr5_m*) and dummy variables for the survey year (*syear*).

$\hat{\beta}_1$ is -4.557 ($p < 0.001$) for Western Germany (Table 13). That indicates that wives who earn more than their husbands spend 4.6 hours less on non-market work per week what contradicts the results presented by Bertrand et al. (2015) for the USA. Also, this result does not support Hypothesis 2 that a wife who earns more than her husbands mitigates the reversal in gender roles by spending more time on housework. In Model 3 and 4, dummy variables for the age of the wife's youngest child (*agekidk*) and the variable *lnlabgroHH*, the logarithm of the sum of the wife's and the husband's income, are added. The estimate of β_1 remains relatively stable

Table 13: Results from the OLS and FE regression for the dependent variables *NMW_weekly* and *NMW_Gap* in Western Germany, 1993-2011

	NMW_weekly	NMW_weekly	NMW_weekly	NMW_weekly	NMW_weekly	NMW_weekly	NMW_weekly	NMW_weekly	NMW_Gap
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
VARIABLES	OLS	OLS	OLS	OLS	OLS	OLS	OLS	FE	FE
wifeEarnsMore	-4.557***	-3.938***	-4.028***	1.366***	-6.389***	-0.323		-1.486***	-2.357***
	(0.249)	(0.241)	(0.236)	(0.302)	(1.096)	(0.347)		(0.265)	(0.351)
antlabgro2						32.582**			
						(11.208)			
antlabgro3						-12.319			
						(7.894)			
antlabgro				-15.891***	-17.278***	-31.397***			
				(0.735)	(0.808)	(4.222)			
antlabgroWEM					13.331***				
					(1.929)				
antlabgro__cat2							-3.985***		
							(0.218)		
antlabgro__cat3							-6.241***		
							(0.289)		
antlabgro__cat4							-6.878***		
							(0.621)		
Observations	23,613	23,613	23,613	23,613	23,613	23,613	23,613	23,613	23,613
Number of pid	7,325	7,325	7,325	7,325	7,325	7,325	7,325	7,325	7,325
R-squared	0.218	0.241	0.252	0.272	0.273	0.274	0.267	0.097	0.120
Adjusted R-squared	0.217	0.240	0.251	0.271	0.272	0.273	0.266	0.0962	0.119
isced and isced__m	YES	YES	YES	YES	YES	YES	YES	NO	NO
agekidk		YES	YES	YES	YES	YES	YES	YES	YES
lnlabgroHH			YES	YES	YES	YES	YES	YES	YES

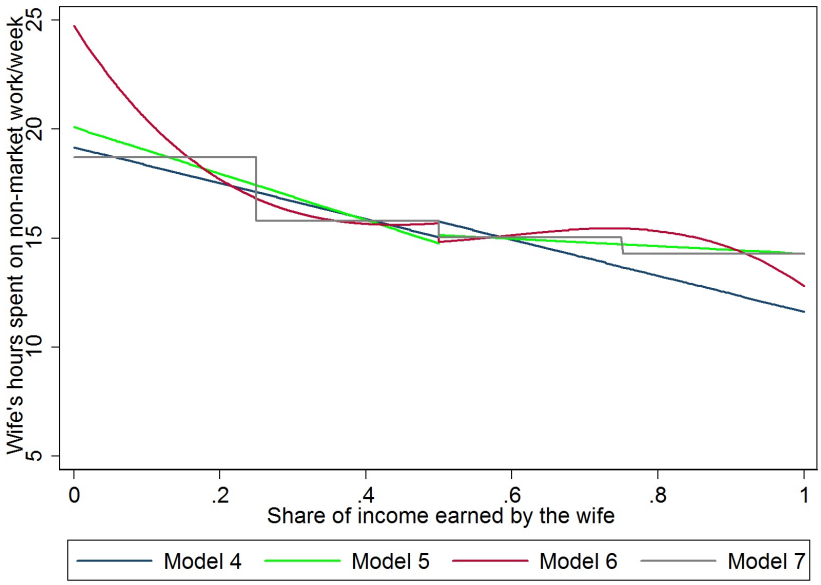
Notes: All models include a dummy variable that indicates if the wife is in the labor force and if the husband is in the labor force, dummy variables for the wife's and the husband's education group from the ISCED classification, dummy variables for the wife's and the husband's age group in five year intervals and dummy variables for the survey year, robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

and statistically significant. In Model 4, the share of the couple's income earned by the wife is added as a control variable. $\hat{\beta}_1$ is now positive (1.366, $p < 0.001$) and the estimate of the regression coefficient for *antlabgro* is -15.891 ($p < 0.001$).
Figure 12 illustrates the regression results for the variables that measure the share of income earned by the wife in a conditional effects plot. The results from Model 4 (blue line) support Hypothesis 2 insofar that the wife's predicted hours of non-market work increase when her share of income becomes higher than that of her husband. But as soon as the wife's share of income exceeds 58.5 percent her predicted hours spent on non-market work are below the predictions if she earned less than 50 percent of relative income. However, it is questionable if the correlation between the wife's hours spent on non-market work and her relative income is linear, so Model 5, 6 and 7 allow more flexibility. In Model 5 (green line), an interaction of the share of income earned by the wife and the dummy variable *wifeEarnsMore* is included (*antlabgroWEM*). Like in Model 4, the prediction for the wife's hours per week spent on non-market work decreases steeply when her share of income increases from 0 to 50 percent. When her share of income exceeds 50 percent, the prediction for the wife's hours spent on non-market work decreases only slightly. This result is confirmed when a third order polynomial of the share of income earned by the wife (*antlabgro2* and *antlabgro3*) is included into the regression in Model 6 (red line) and when the share of income earned by the wife is modeled via a set of dummy variables (*antlabgro_cat2*, *antlabgro_cat3* and *antlabgro_cat4*) in Model 7 (grey line).
The results from Models 5, 6 and 7 show that women barely spend less time on non-market work as soon as they earn more than their husbands. Like in the analysis of labor supply in the previous chapter, the concern that *wifeEarnsMore* is endogenous could be raised. For example, women who have a low preference for non-market work might tend to marry men whose income is more similar or below their own whereas women who have a high preference for non-market work might be more attracted to men whose income is above their own. So the negative estimate of β_1 might be due to preferences on the marriage market. Next, FE estimation is used to control for time constant unobserved heterogeneity. Results from the following FE specification are reported in Table 13:

$$NMW\_weekly_{it} = \alpha_i + \beta_1 wifeEarnsMore_{it} + \boldsymbol{\beta}_2 \mathbf{X}_{it} + \epsilon_{it} \tag{18}$$

The vector $\mathbf{X}$ contains the same set of control variables as the OLS specification above, except that *isced* and *isced_m* are not as the level of education is almost constant over time. $\mathbf{X}$ further includes dummy variables for the age of the wife's youngest child (*agekidk*) and the logarithm of the sum of the wife's and the husband's

Figure 13: Conditional effects plot of the share of income earned by the wife on the wife's hours spent on non-market work per week in Model 4-7 in Eastern Germany, 1993-2011



Notes: Hours spent on non-market work are predicted for working couples in the education group "vocational training" and age group "40-44" in the survey year 2001 without children and with an inflation-adjusted pre-tax household income of 4,459 €/month (mean inflation-adjusted pre-tax income in the sample)

Table 14: Results from the OLS and FE regression for the dependent variables *NMW_weekly* and *NMW_Gap* in Eastern Germany, 1993-2011

	NMW_weekly	NMW_weekly	NMW_weekly	NMW_weekly	NMW_weekly	NMW_weekly	NMW_weekly	NMW_weekly	NMW_Gap
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
VARIABLES	OLS	OLS	OLS	OLS	OLS	OLS	OLS	FE	FE
wifeEarnsMore	-1.369***	-1.267***	-1.260***	0.711	-4.091**	-0.846*		-0.715**	-1.055**
	(0.303)	(0.297)	(0.296)	(0.400)	(1.249)	(0.426)		(0.257)	(0.322)
antlabgro2						94.146***			
						(20.606)			
antlabgro3						-53.393***			
						(12.676)			
antlabgro				-8.260***	-10.669***	-51.857***			
				(1.392)	(1.827)	(9.588)			
antlabgroWEM					8.953***				
					(2.479)				
antlabgro_cat2							-2.902***		
							(0.538)		
antlabgro_cat3							-3.658***		
							(0.584)		
antlabgro_cat4							-4.418***		
							(0.715)		
Observations	7,266	7,266	7,266	7,266	7,266	7,266	7,266	7,266	7,266
Number of pid	2,011	2,011	2,011	2,011	2,011	2,011	2,011	2,011	2,011
R-squared	0.265	0.275	0.280	0.286	0.287	0.290	0.286	0.160	0.195
Adjusted R-squared	0.261	0.271	0.276	0.282	0.283	0.286	0.282	0.157	0.192
isced and isced_m	YES	YES	YES	YES	YES	YES	YES	NO	NO
agekidk		YES	YES	YES	YES	YES	YES	YES	YES
lnlabgroHH			YES	YES	YES	YES	YES	YES	YES

Notes: All models include a dummy variable that indicates if the wife is in the labor force and if the husband is in the labor force, dummy variables for the wife's and the husband's education group from the ISCED classification, dummy variables for the wife's and the husband's age group in five year intervals and dummy variables for the survey year, robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

inflation-adjusted pre-tax income (*lnlabgroHH*). $\hat{\beta}_1$ is -1.486 ($p < 0.001$), so again, that contradicts Hypothesis 2 that women increase their supply of non-market work when they earn more than their husbands. The result from Model 8 indicates that women reduce their weekly time for non-market work by 1.5 hours when their income exceeds that of their husbands.

Bertrand et al. (2015) expand their work by analysing the non-market work gap and so do we. The results from the following FE specification are given in Table 13:

$$NMW\_Gap_{it} = \alpha_i + \beta_1 wifeEarnsMore_{it} + \boldsymbol{\beta}_2 \mathbf{X}_{it} + \epsilon_{it} \tag{19}$$

$\mathbf{X}$ is defined exactly as in Model 8. *NMW_Gap* is the difference between the wife's and the husband's weekly time for non-market work. $\hat{\beta}_1$ is negative (-2.357, $p < 0.001$), meaning that the wife-husband gap in non-market work decreases by 2.4 hours when the wife's income is higher than her husband's. Again, this result contradicts Hypothesis 2.

The results of the regression for Eastern Germany are presented in Table 14. In the baseline model (Model 1), $\hat{\beta}_1$ is negative (-1.369, $p < 0.001$). The estimate of β remains relatively stable when control variables for the age of the youngest child and the logarithm of the sum of the wife's and the husband's inflation-adjusted pre-tax income are included in Model 2 and 3. So, as in Western Germany, Hypothesis 2 from chapter 2.2 cannot be supported.

In Model 4, the variable *antlabgro* is included into the regression. Like in Western Germany, the estimate of the regression coefficient for *antlabgro* is negative (-8.260, $p < 0.001$). $\hat{\beta}_1$ is positive (0.711) but insignificant. Based on the results from Model 4, the wife's hours of non-market work decrease when her share of relative income increases. A graphical representation of the conditional effects of Model 4 is presented in Figure 13 (blue line). The graph is constructed exactly as Figure 12 for Western Germany. The results from model 5 (green line), 6 (red line) and 7 (grey line) confirm that like in Western Germany, the wife's predicted hours spent on non-market work barely decrease as soon as she earns more than 50 percent of relative income. The results from the FE regressions in Columns 8 and 9 for the dependent variables *NMW_weekly* and *NMW_Gap* don't provide evidence for Hypothesis 2 neither. $\hat{\beta}_1$ is -0.715 ($p < 0.01$) in Model 8. Wives who earn more than their husbands reduce their weekly time for non-market work by almost three-quarters of an hour and the results from Model 9 suggest that the wife-husband gap in non-market work decreases by about one hour when the wife's income exceeds her husband's income ($\hat{\beta}_1$=-1.055, $p < 0.01$).

Overall, the results from Western and Eastern Germany do not support Hypothesis

2, that women who earn more than their husbands increase their supply of non-market work as shown in Bertrand et al. (2015) for the USA. But it could be shown that the predicted hours the wife spends on non-market work barely further decline as soon as she earns at least 50 percent of relative income.

4 Summary and conclusion

We showed that there is a drop in the distribution of relative income when the wife earns more, like in the study of Bertrand et al. (2015). The drop in the distribution is higher in Western Germany than in Eastern Germany. This corresponds to the higher agreement to the statement "If a woman earns more money than her husband, it's almost certain to cause problems" in the WVS. Different ideals and statutory frameworks concerning female labor force participation in the former GDR and the FRG during the time of German separation presumably contribute to the difference in Eastern and Western Germany. The higher agreement to traditional gender roles and the higher drop in the distribution of relative income in Western Germany are in line with the identity economics model, that suggests that identity norms shape slowly. The results confirmed the expected difference in gender identity that remains from the time of separation and gave the motivation to continue separate analyses for Eastern and Western Germany.

Bertrand et al. (2015) concluded from the drop in the distribution of relative income that couples avoid allocations where the wife earns more. The *first hypothesis* states that a wife who would earn more than her husband distorts her labor market outcome. This could only partially be shown for Germany. Using OLS and FE regression, no statistically significant influence of the probability that the wife earns more on the probability that she *participates in the labor market* was found in Western and Eastern Germany. When the wife's potential income is defined as the mean income of all working women in her demographic group, the results from the OLS regression indicate a positive correlation between the probability that the wife earns more and the *gap between her actual and her potential income* in Western Germany. This implies that women with a high probability to earn more than their husbands have an income above their potential, what contradicts Hypothesis 1. Nevertheless, in Eastern Germany, there is a negative correlation, which is in line with the results for the USA. However, the effect is not statistically significant. The probability that the wife earns more might be endogenous, so FE regression was used to control for time constant heterogeneity. Here, no statistically significant correlation between the probability that the wife earns more and her income gap was found in Western

and in Eastern Germany. It was suspected, that the differences to the results from Bertrand et al. (2015) stem from differences in the labor market supply for women in Germany and the USA. As part time employment is more common among German women, especially in Western Germany, the analysis was restricted to full time working couples and the wife's potential income was defined as the mean income of all full time working women in her demographic group. Hypothesis 1 and the results from Bertrand et al. (2015) were now supported by the FE regression, but only in Western Germany.

Hypothesis 2 states that wives who actually have a higher income than their husbands mitigate the reversal of gender roles by increasing their contribution to home production activities. The results for Western and Eastern Germany from the OLS and FE regression imply that wives do less non-market work and that the gender gap in non-market work decreases when the wife's income exceeds that of her husband. When a more flexible functional form of the share of income earned by the wife is included into the regression model, it turns out that the predicted hours of non-market work per week barely decrease as soon as the wife earns more in Western and in Eastern Germany.

To conclude, the results from the FE regressions showed that gender identity has an effect on labor market outcomes of full time working women, but only in Western Germany. This result suggests that there are still substantial differences in gender identity between Eastern and Western Germany and that married women in Western Germany are more obliged to traditional gender roles than married women in Eastern Germany. The finding that women barely decrease their weekly hours of non-market work once they earn more implies that gender identity also influences the supply of non-market work in Germany, but not as strong as in the USA stated in Bertrand et al. (2015).

Although this study has successfully demonstrated that gender identity has an impact on economic decisions in the household in Germany, it has certain limitations in terms of the relatively imprecise estimate of the probability that the wife earns more. Due to the limited sample size of the SOEP, the demographic groups were defined very broadly in comparison to Bertrand et al. (2015). It would be interesting to see if the results from chapter 3.2 hold for smaller demographic groups. Another major limitation is that the distribution of income in the demographic groups is pooled over the years 1984 to 2012 in Western Germany and 1991 to 2012 in Eastern Germany. So changes in the potential income of wives over time are neglected. Such changes could for example be tax reforms or other legislative reforms that affect the labor supply of women. Also, the theoretic framework of identity economics

allows prescriptions and losses from identity to change over time and losses from violating the social norm that a wife should not earn more money than her husband might not be constant from 1984 to 2012. A more precise estimate of the probability that the wife earns more that accounts for changes over time would probably yield better estimates of the regression coefficients, especially in the FE regression. Also, as Bertrand et al. (2015) noted, the probability that the wife earns more as it is also calculated here is based on *observed* labor market outcomes, which is very likely already influenced by gender identity norms, but also by fiscal incentives etc.

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