Online Appendix

Taxation and Labor Supply of Married Couples across Countries: A Macroeconomic Analysis

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B Data Appendix

B.1 Data Issues in the ELFS

For data reasons detailed in Bick et al. (2017), we exclude the years 2001 for the UK and 2005 for Spain from the analysis. Furthermore, we exclude the year 2001 for Italy and the year 2008 for Ireland because the OECD Taxing Wages module does not produce the corresponding tax rates. We exclude households in the ELFS in which at least one member lives in an institution, since the CPS does not cover individuals living in institutions. This leads to the deletion of a negligible number of observations. A detailed description of all issues related to the construction of the data sets can be found in Bick et al. (2017).

B.2 Dealing with Missing Household Identifiers in Scandinavia

For the three Scandinavian countries Denmark, Norway, and Sweden, the ELFS does not provide household identifiers in the anonymized data set available to researchers. Therefore, we neither know the age of the husband, nor the education of the husband, nor how many married adults and how many children live in the household. This has three consequences for our analysis based on the ELFS. First, in terms of our sample of married women, all Scandinavian statistics reported in the paper are based on all married women aged 25 to 54 (except if we do not observe their education), rather than on the subset of married women aged 25 to 54 whose husband is aged 25 to 54 as well, for whom we know the education of the husband, and with whom no more than one other married adult lives in the same household. Second, when we analyze hours worked by presence of children in the data, we exclude Scandinavian countries. Third, the simulation of the model uses as inputs the matching into couples based on both spouses' education, as well as the fraction of couples with zero to four children by educational match. For the Scandinavian countries, we calculate the corresponding statistics in the EU-SILC and use them as an input for solving the model. Online Appendix Section B.7 shows that data in the ELFS and the EU-SILC are similar along several relevant dimensions, and that within the EU-SILC relevant data for married women in Scandinavia are similar whether focusing on all married women aged 25 to 54 or on the subset of married women aged 25 to 54 who match our more stringent sample selection criteria.

B.3 Sample Selection Criteria

We restrict our sample to married households in which both partners are observed and fit our sample restrictions. Since clear identifiers for husbands and wives are missing for many years and countries, we define couples consistently as two people of opposite sex who are both married and live in the same household, and drop households in which more than two married adults live. Since we model heterogeneity through differences in education levels, we exclude individuals with missing information on own education or partner's education.

There are three reasons why a married individual aged 25 to 54 might be dropped from our sample: first,

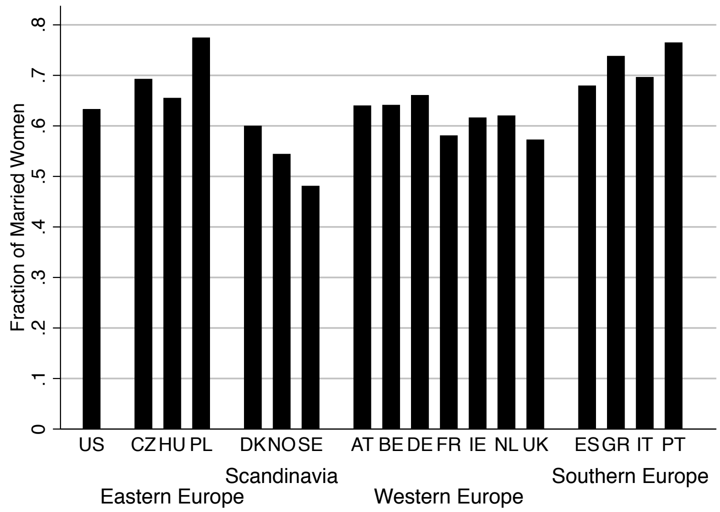
Table B.1: % of Observations Dropped from the Sample

Country	Men	Women
Czech Republic	8.7	17.2
Hungary	10.0	18.2
Poland	17.4	23.7
Mean	*12.0*	*19.7*
Denmark	0.9	1.0
Norway	2.3	3.1
Sweden	0.6	0.7
Mean	*1.2*	*1.6*
Austria	12.7	20.3
Belgium	11.9	21.4
France	7.9	15.8
Germany	12.0	20.7
Ireland	9.5	15.9
Netherlands	6.4	14.8
United Kingdom	13.0	21.6
Mean	*10.5*	*18.7*
Greece	8.1	22.8
Italy	8.1	19.0
Portugal	10.7	17.7
Spain	9.0	16.7
Mean	*9.0*	*19.1*
United States	11.4	16.1

because we cannot identify the partner due to more than two married adults or no other married adult living in the household; second, because the partner might be younger than 25 or older than 54; third, because education information might be missing for the respondent or the partner. On average, around 11% of male and 19% of female observations are dropped because of these restrictions (see Table B.1). The percentage is always larger for women than for men, because it is more likely for women that the partner is older than 54. Variation across countries arises because of variation in the number of missing education observations, variation in the age structure of couples and age at marriage, and variation in the number of married adults living in one household.[1] In the ELFS data for the Scandinavian countries we miss household identifiers (see Appendix B.2 for further information on how we deal with missing household identifiers in Scandinavia). Therefore, the only reason why married individuals might be dropped is missing information on their own education, leading to a small fraction of observations dropped for the Scandinavian countries.

[1] E.g., Poland, which has the largest share of observations dropped, exhibits a higher than average percentage of individuals married to someone younger than 25, as well as an above average number of households consisting of three or more married adults.

Figure B.1: Fraction of Married Women (Ages 25-54)



B.4 Married Mothers' Labor Supply by Presence of Children in Household

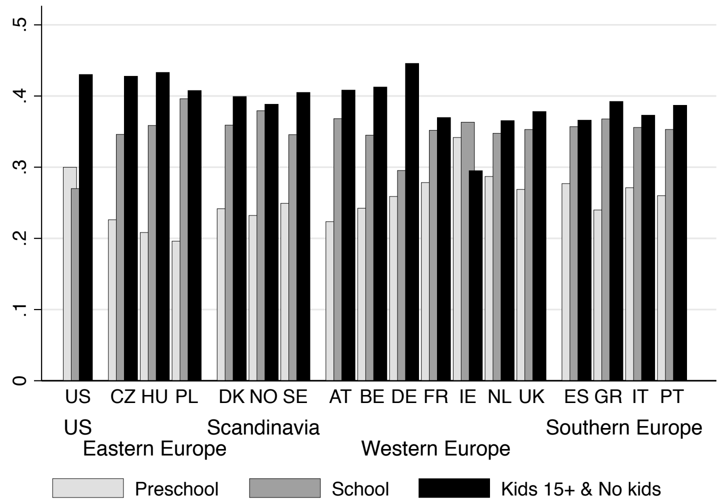
Figure B.2 shows the percentage of married women in our sample with a youngest child of preschool age (aged 0-4 in Europe, 0-5 in the US), a youngest child of school age (aged 5-14 in Europe, 6-13 in the US), and no child of either preschool or school age.[2] The group of women with preschool children is the smallest group in all countries, making up on average 25.5% of our sample of married women, and never exceeding 30% except for Ireland, where they constitute with 34% the second largest group.[3]

Figure B.3 shows differences in both margins of labor supply (employment rate in panels (a) and (b), and hours worked per employed in panels (c) and (d)) from the behavior of the same group in the US, contrasting women with preschool children on the y-axis and women without children younger than 15 (i.e., either with children aged 15 or above in the household, or no children in the household) on the x-axis in panels (a) and (c). In panels (b) and (d) the same comparison is drawn for women with school aged children on the y-axis. The age always refers to the youngest child. Since we are focusing on a comparison to the respective US group, we already take care of general differences between these three groups that apply in all countries. In fact, in the US women with preschool (school) children have an 18 (6) percentage point lower employment rate than women without children younger than 15, and work 14 (8)% lower hours conditional on working. Focusing on women with school children compared to women without children younger than 15 in panels (b) and (d), differences in employment rates and hours worked per employed across countries are generally quite small. This is not the case for mothers of preschool children, where specifically the employment rate

[2] Note that for Scandinavia these data come from the EU-SILC.

[3] In the US, the group of women with school children make up a slightly smaller share than the group of women with preschool children. Note, however, that the age definition of the groups is slightly different for the US, which in itself leads to a larger share of women with preschool children and a smaller share of women with school children compared to the definition applied in the European countries.

Figure B.2: Sample Composition by Presence of Children in Household



of women shows a lot of country-specific idiosyncracies, as panel (a) shows. Strikingly low employment rates in the Czech Republic and Hungary for women with preschool children, and relatively high ones in all Southern European countries, especially Portugal, and in Belgium and the Netherlands stand out. For hours worked per employed in panel (c), the country-ordering is similar for both groups of women, but the differences for mothers with preschool children relative to the US are substantially larger in four of the seven Western European countries and the Czech Republic than the differences for women without children younger than 15.

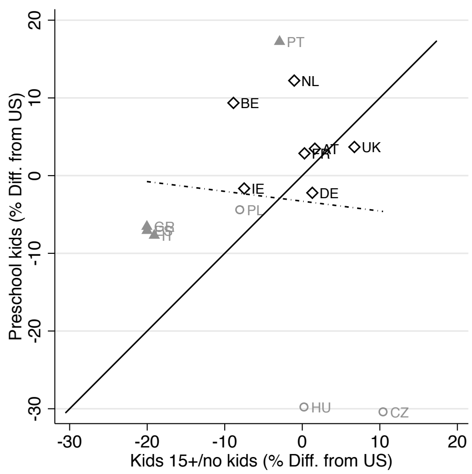
While we do not observe children for Scandinavian countries in the ELFS, we can compute employment rates of Scandinavian women by presence of children in the EU-SILC. While mothers of children 15 or older or women without children have 7 percentage points higher employment rates than the respective group in the US on average across the three Scandinavian countries, the differences for women with preschool or school children are larger with on average 18 and 14 percentage points higher employment rates. Thus, Scandinavian mothers feature relatively high employment rates.

Table B.2 shows the resulting differences in hours worked per married woman for the country group averages. The general pattern that hours worked differences to the US are larger for Western and Southern Europe than for Eastern Europe holds for both women with school children and for women without children younger than 15 years. For women with preschool children, however, the largest differences to the US occur in Eastern Europe, driven by the very low employment rates in the Czech Republic and Hungary. Note that the Eastern European countries are also the ones with the smallest share of women with preschool children by international comparison. In Western Europe, women with preschool children show similar labor supply patterns than the other two groups of women (always relative to the US counterparts), but in Southern Europe their hours worked are somewhat higher.

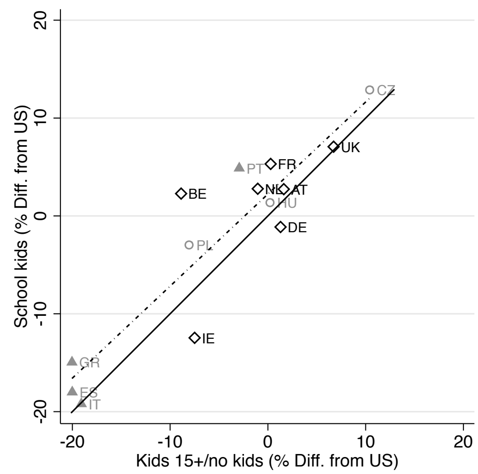
Figure B.3: Differences Relative to US by Presence of Children

Employment Rates

(a) Preschool vs. Kids 15+/No Kids

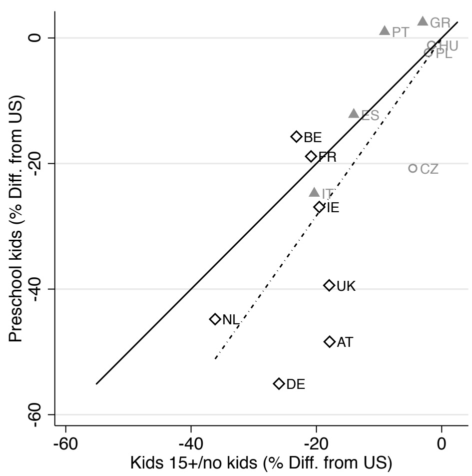


(b) School vs. Kids 15+/No Kids

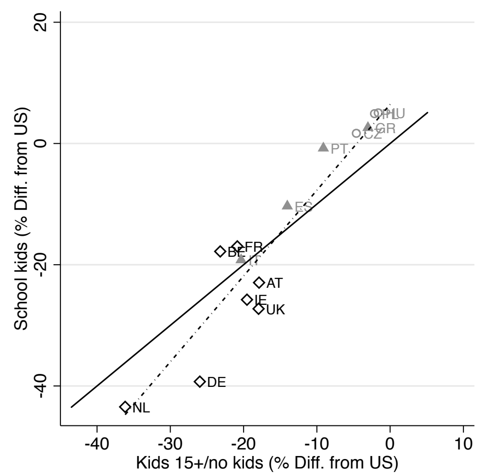


Hours Worked per Employed

(c) Preschool vs. Kids 15+/No Kids



(d) School vs. Kids 15+/No Kids



Note: Employment rate differences relative to the US are shown in percentage points and hours worked per employed differences in%.

To summarize, women with preschool children often behave differently from other women in a given country in a non-systematic way (least so in Western Europe), which points to factors like child care and maternity leave policies playing a role. Since the group of women with preschool children is however relatively small, these differences are not the major determinant of the international differences of married

Table B.2: Hours Worked per Person Differences to US by Presence of Children

Region	All women	Preschool kids	School kids	Kids 15+/no kids
Eastern Europe	−2.6	−40.6	9.2	−1.8
Scandinavia	–	–	–	–
Western Europe	−26.4	−31.0	−26.6	−24.1
Southern Europe	−22.5	−9.0	−21.7	−29.2
Europe	−20.2	−26.8	−17.5	−20.8

women's labor supply.

B.5 Married Womens' Labor Supply by Age

Figure B.4 shows the age composition in our sample, focusing on three different age groups, namely ages 25-34, 35-44, and 45-54. The share of the youngest group is somewhat lower in Scandinavia and Western Europe, and the share of the oldest group somewhat larger in Scandinavia. This stems from the different sample selection criteria we have to apply to Scandinavia in the ELFS because we cannot identify the age of the spouse. In the EU-SILC we know the age of the spouse also for Scandinavia. The share of 45-54 year olds in Scandinavia falls from 40% to 32%, which is in line with the other countries, if we also condition on the age of the spouse. Whether we condition on the age of the spouse in Scandinavia or not has however almost no effect on married women's employment rates in the EU-SILC, which are 84.3% in the former case and 83.6% in the latter (see Online Appendix Section B.7.2).

Figure B.4: Age Group Composition

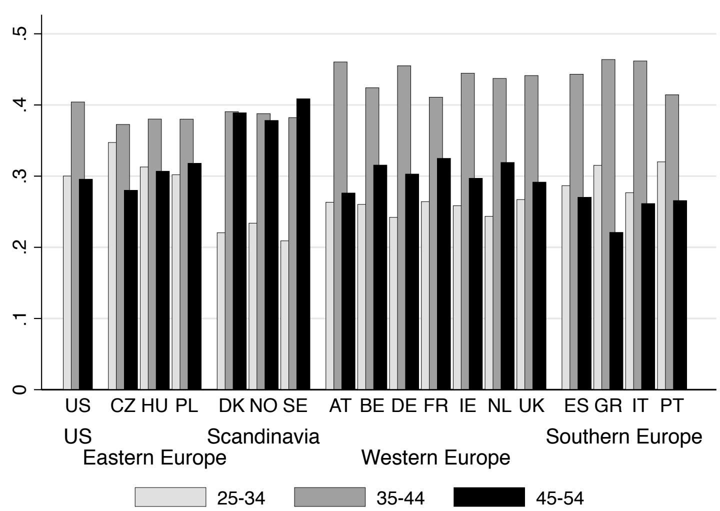
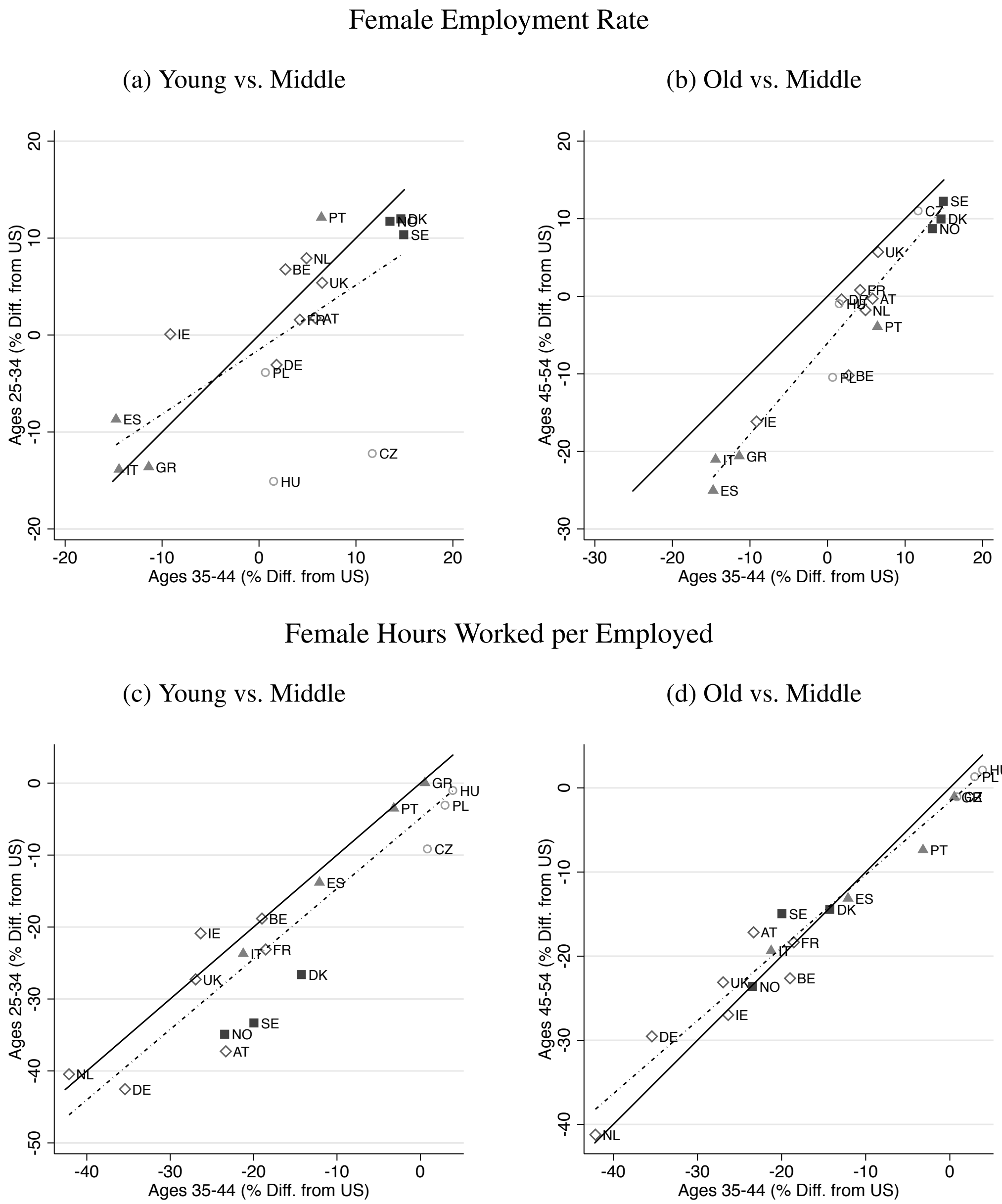


Figure B.5: Age Group Differences Relative to US



Note: Employment rate differences relative to the US are shown in percentage points and hours worked per employed differences in%.

For each of the three age groups, Figure B.5 shows the deviations of both margins (employment rate in panels (a) and (b), and hours worked per employed in panels (c) and (d)) from the respective age group in the US, contrasting young and middle in panels (a) and (c), as well as old and middle in panels (b) and (d). Panel (d) shows that the hours worked per employed differences to the US are almost exactly the same

Table B.3: Hours Worked per Person Differences to US by Age

Region	All women	Ages 25-34	Ages 35-44	Ages 45-54
Eastern Europe	−2.6	−19.4	9.1	0.5
Scandinavia	−6.4	−19.9	−2.9	−6.2
Western Europe	−26.4	−26.9	−24.9	−28.7
Southern Europe	−22.5	−17.8	−19.5	−31.3
Europe	−17.7	−22.2	−13.7	−20.2

for the old and the middle aged groups. The young show systematically larger hours worked per employed differences to the US than the middle aged, yet the magnitudes are small. Regarding the employment rate, the difference to the US is larger for older women than for women from the middle age group, possibly indicating cohort effects. This is especially true for Southern Europe. For the young vs. the middle aged, there are no systematic differences, but young women in Hungary and the Czech Republic feature very low employment rates. This is mostly due to the behavior of women with preschool children, as we have shown in the previous subsection (B.4).

Table B.3 summarizes what these differences add up to in terms of hours worked per person. Indeed, hours worked per person differences to the US show some heterogeneity across age groups except for Western Europe. Still, the major pattern is preserved: Differences to the US are larger for Southern and Western Europe than for Scandinavia and Eastern Europe for each age group. Differences between the European country groups are generally smallest for the youngest age group. In the previous Section (B.4), we show differences by the presence of preschool children, which are relatively large in Eastern Europe and relatively small in Southern Europe, each time compared to women with school age or older children. This drives the smaller differences across European country groups for the younger age group.

B.6 Potential Supply Side Effects on Hours Worked

We assume in our analysis that differences in hours are driven by the supply side, and not by the demand side. However, international differences in unemployment rates could indicate different probabilities of finding a job. To see how large these differences could potentially be, we take the extreme view that all unemployment differences are driven by the labor demand side. We therefore exclude all households in which the wife and/or the husband is unemployed from the sample, and recompute our labor supply measures. Relative to the US, male and female hours worked per person increase in Eastern Europe and Southern Europe. However, the changes are not dramatic: hours worked per married woman differences to the US change from -3% to 3% in Eastern Europe, and decrease in absolute terms by 4 percentage points in Southern Europe, see Table B.4.[4]

[4]These results are in line with unemployment rates obtained from the World Development Indicators. Some countries, especially Poland, Greece, Italy, Spain, France, and Belgium, suffer from very high youth unemployment rates during the sample period, but unemployment rate differences for the core age group are less dramatic.

Table B.4: Labor Supply of Married Men and Women (difference to the US) – All (Raw) and Excluding Unemployed Individuals

	$\mathbf{HWP}_m$		$\mathbf{ER}_f$		$\mathbf{HWP}_f$	
Country	Raw	w/o UE	Raw	w/o UE	Raw	w/o UE
Czech Republic	−3.6	−3.5	2.9	6.0	1.8	5.9
Hungary	−15.8	−14.8	−4.5	−2.9	−4.2	−1.7
Poland	−14.0	−8.4	−4.2	2.7	−5.2	4.5
Mean	*-11.1*	*-8.9*	*-1.9*	*1.9*	*-2.6*	*2.9*
Denmark	−12.8	−13.5	12.9	13.7	−1.3	−0.7
Norway	−17.6	−18.6	11.9	11.6	−13.3	−13.8
Sweden	−16.5	−16.1	13.7	15.0	−4.5	−3.4
Mean	*-15.6*	*-16.1*	*12.8*	*13.4*	*-6.4*	*-6.0*
Austria	−7.3	−7.2	3.3	4.2	−21.5	−20.6
Belgium	−12.9	−12.1	0.0	1.9	−20.0	−17.8
France	−16.0	−14.9	2.7	5.9	−16.5	−12.8
Germany	−14.5	−11.0	0.3	3.9	−34.8	−31.9
Ireland	−4.8	−4.9	−8.6	−8.8	−34.3	−34.1
Netherlands	−9.6	−10.7	3.9	4.1	−38.2	−38.1
United Kingdom	−7.2	−7.8	6.1	6.3	−19.4	−19.3
Mean	*-10.3*	*-9.8*	*1.1*	*2.5*	*-26.4*	*-24.9*
Greece	−2.4	−2.7	−14.4	−11.6	−20.7	−16.3
Italy	−14.1	−14.0	−16.0	−14.6	−39.3	−37.4
Portugal	−10.2	−9.5	5.3	8.3	2.6	6.5
Spain	−11.7	−10.3	−15.8	−12.7	−32.6	−28.3
Mean	*-9.6*	*-9.1*	*-10.2*	*-7.7*	*-22.5*	*-18.9*

Note: For the employment rate we show percentage point differences, and for hours worked per person% differences.

Table B.5: Data Sources

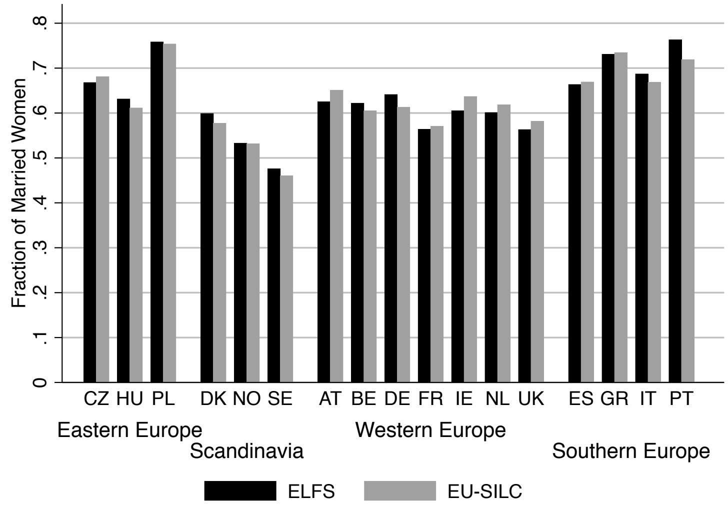
Variables	Countries	Data Source
Labor supply measures	US	CPS
	Germany	Microcensus
	Scandinavia	ELFS
	Remaining countries	ELFS
Fraction of married couples	US	CPS
by educational match	Germany	Microcensus
	Scandinavia	EU-SILC
	Remaining countries	ELFS
Children	US	CPS
by educational match	Germany	Microcensus
	Scandinavia	EU-SILC
	Remaining countries	ELFS
Wages	US	CPS
by own education	Germany	EU-SILC
	Scandinavia	EU-SILC
	Remaining countries	EU-SILC
Statutory Labor Income Tax Codes	All countries	OECD Taxing Wages modules
	US prior to 2001	NBER TaxSim module
Consumption Tax Rates	Hungary	OECD
	All remaining countries	McDaniel (2012)

B.7 EU-SILC

Individuals in our model differ by their gender and education level, which map one to one into differences in wages. Since the ELFS neither includes information on wages nor on earnings, we use the EU Statistics on Income and Living Conditions (EU-SILC) to calculate wages by gender and education. The EU-SILC is set up to provide comparative statistics on income and social inclusion in the European Union (EU), and has both a cross-sectional and longitudinal component.[5] The general sampling criteria are the same as for the ELFS. The sample size is however much smaller, ranging from 7,038 respondents aged 15-64 in the Czech Republic in 2005 to 41,032 respondents in Italy in 2004. Moreover, the survey covers only a subperiod of the years used in our analysis, with the first available year being 2004. Most importantly, the EU-SILC does not contain any information on actual hours worked, but only on usual hours worked. In Bick et al. (2017), we explain that actual hours are however crucial to construct internationally comparable annual hours worked measures. Table B.5 lists the data sources for all variables used in the paper and thus makes it clear when we rely on the EU-SILC.

[5]For details see http://ec.europa.eu/eurostat/web/income-and-living-conditions/overview.

Figure B.6: Female Marriage Rates



B.7.1 Comparison of EU-SILC and ELFS Data

Since we impute wages from the EU-SILC into the ELFS, it would be reassuring to know that both data sets look similar along important dimensions. To analyze this, we first compare marriage rates of women aged 25 to 54 between both data sets. Then, focusing on women who fit our sample selection criteria, we compare the educational composition and the presence of children in households between both data sets. Last, we analyze whether employment rates and usual hours worked are similar across both data sets. In these comparisons, we always use for the ELFS only the sample years for which the EU-SILC is available.

Figure B.6 shows marriage rates of women aged 25 to 54 in the ELFS and the EU-SILC. These are indeed quite similar, with the largest deviation of 5 percentage points coming from Portugal.

Table B.6 shows the educational composition of women aged 25 to 54 who satisfy our sample selection criteria in both data sets. Note that here and in the next two tables, we use for Scandinavia the sample selection criteria that we can apply in the ELFS, i.e. we include all married women aged 25 to 54 with non-missing education. For all other countries, the additional selection criteria of no more than two married individuals in the household, husband's age between 25 to 54, and husband's education non-missing are also applied in both data sets. Again, one can see that differences are generally small, which is also the case for the educational composition of men (not shown here). A notable exception is the UK, where the share of low educated is 15.6 percentage points higher in the ELFS than in the EU-SILC, and the share of medium educated is 12.5 percentage points lower. We investigate the reason for this difference. As described in footnote 15, the ELFS defines low education as ISCED levels 0 to 2, medium as ISCED levels 3 and 4, and high as ISCED levels 5 and above. There is however one exception to this: the subcategory 3c "upper secondary education shorter than two years" is defined as low education. While in the earlier sample years the ELFS only provides the three main education categories low, medium, and high, in the

Table B.6: Fraction of Women by Educational Level in ELFS and EU-SILC

	Low		Medium		High	
Country	ELFS	EU-SILC	ELFS	EU-SILC	ELFS	EU-SILC
Czech Republic	7.6	7.7	78.9	78.1	13.6	14.3
Hungary	19.0	18.6	60.4	59.7	20.6	21.7
Poland	8.8	8.4	68.7	68.8	22.5	22.8
Mean	*11.8*	*11.5*	*69.3*	*68.8*	*18.9*	*19.6*
Denmark	20.2	20.2	43.0	44.5	36.8	35.3
Norway	15.4	14.3	44.8	46.8	39.8	38.9
Sweden	14.3	9.0	46.5	49.0	39.2	42.0
Mean	*16.7*	*14.5*	*44.8*	*46.7*	*38.6*	*38.8*
Austria	22.6	21.9	62.2	61.0	15.2	17.1
Belgium	25.9	19.1	37.5	37.6	36.6	43.3
France	27.8	24.6	42.4	45.1	29.8	30.3
Germany	17.0	13.0	62.3	63.5	20.6	23.5
Ireland	24.6	27.6	42.6	38.8	32.8	33.6
Netherlands	25.9	24.7	46.9	46.4	27.2	29.0
United Kingdom	26.6	11.0	39.4	51.9	34.0	37.1
Mean	*24.3*	*20.3*	*47.6*	*49.2*	*28.0*	*30.5*
Greece	31.5	32.3	45.6	42.9	22.9	24.8
Italy	43.6	44.4	43.3	42.3	13.1	13.3
Portugal	69.4	71.4	14.9	13.7	15.7	14.9
Spain	46.1	45.6	23.1	23.3	30.8	31.1
Mean	*47.6*	*48.4*	*31.7*	*30.6*	*20.6*	*21.0*

later sample years we can also observe the number of observations in each subcategory. The category 3c "upper secondary education shorter than two years" indeed plays a significant role in the UK, but in no other sample country. The EU-SILC seems to place this category into upper secondary and therefore medium education. Unfortunately the EU-SILC does not provide the finer subcategories, which would have allowed us to categorize individuals with the ISCED level 3c as low educated. As a consequence, we have to live with this discrepancy. As Figure 3 shows, the educational shares in the UK (from the ELFS) and also the education gradient in wages (from the EU-SILC) are both in line with other Western European countries. Regarding the sample composition in terms of number of children in the household, presented in Table B.7, differences between the ELFS and the EU-SILC are all minor.

Having shown that the sample composition is similar in both data sets, we now compare employment rates of our selected samples in both data sets. Because actual hours worked per employed are not reported in the EU-SILC, we cannot compare hours worked per employed, but we can compare usual weekly hours worked per employed. The results are shown in Table B.8. Overall, labor supply measures in both data sets

Table B.7: Children Distribution in ELFS and EU-SILC

	0 Kids		1 Kids		2 Kids		3 Kids		4 Kids	
Country	ELFS	EU-SILC	ELFS	EU-SILC	ELFS	EU-SILC	ELFS	EU-SILC	ELFS	EU-SILC
Czech Republic	26.5	27.4	30.0	31.6	36.1	34.7	6.0	5.2	1.4	1.0
Hungary	28.0	25.2	31.1	32.4	29.3	30.5	9.1	9.2	2.5	2.7
Poland	24.3	25.6	33.4	33.7	29.7	29.6	8.9	8.1	3.7	2.9
Mean	*26.3*	*26.1*	*31.5*	*32.6*	*31.7*	*31.6*	*8.0*	*7.5*	*2.5*	*2.2*
Denmark	–	28.7	–	22.3	–	34.5	–	11.8	–	2.7
Norway	–	26.0	–	22.0	–	33.5	–	15.0	–	3.5
Sweden	–	25.0	–	23.3	–	35.6	–	12.6	–	3.5
Mean	–	*26.6*	–	*22.5*	–	*34.5*	–	*13.1*	–	*3.2*
Austria	26.2	28.1	28.9	29.0	32.5	30.9	9.7	9.6	2.7	2.4
Belgium	26.6	27.1	26.2	26.2	31.7	29.1	11.6	13.2	3.9	4.3
France	22.9	21.1	26.7	27.2	34.2	37.4	12.8	11.5	3.5	2.8
Germany	30.4	28.9	29.6	27.6	30.1	32.6	7.9	9.0	2.1	1.9
Ireland	18.8	16.7	22.3	24.8	31.9	33.4	18.5	18.3	8.5	6.8
Netherlands	22.7	22.7	22.6	22.5	38.1	36.8	13.2	13.6	3.4	4.4
United Kingdom	26.9	28.4	24.4	25.7	33.8	33.5	11.1	9.8	3.7	2.7
Mean	*24.9*	*24.7*	*25.8*	*26.1*	*33.2*	*33.4*	*12.1*	*12.2*	*4.0*	*3.6*
Greece	26.6	23.2	29.5	29.9	35.3	43.6	7.1	2.5	1.6	0.7
Italy	24.0	23.4	35.8	35.8	33.3	34.0	6.0	6.1	0.9	0.7
Portugal	25.2	23.4	41.1	43.2	27.7	28.9	4.8	3.8	1.1	0.6
Spain	23.4	26.6	34.6	34.7	34.8	34.6	5.8	3.4	1.3	0.6
Mean	*24.8*	*24.2*	*35.3*	*35.9*	*32.8*	*35.3*	*5.9*	*4.0*	*1.2*	*0.7*

are very similar. Employment rate differences between both data sets are typically smaller than 3 percentage points, with the exception of the male employment rate in Ireland, which is 3.6 percentage points higher in the ELFS than in the EU-SILC, and female employment rates in the Netherlands, Austria, and Hungary, where the difference between both data sets amounts to 8.2, 7.6, and 5.5 percentage points, respectively. Usual weekly hours worked per employed differences between both data sets never exceed 3 hours for women, but do so for men in Hungary, Norway, Belgium, and Ireland. For the cases of larger differences, we confirm that these differences are already present when we focus on the total population aged 15 to 64, i.e. they are unrelated to our sample selection criteria.

B.7.2 Comparison of Different Scandinavian Sample Selection Criteria in EU-SILC

Since we are missing household identifiers for the Scandinavian countries in the ELFS, we have to recur to slightly different sample selection criteria than for the other countries. Specifically, while we exclude women living with more than 1 other married adult in the household, with a husband younger than 25 or older than 54, or with a husband whose education status is missing in all other countries, we cannot apply these exclusion restrictions for Scandinavia. However, in the EU-SILC we can compare the Scandinavian

Table B.8: Employment Rates and Usual Hours in ELFS and EU-SILC

Country	ER male		UHWE male		ER female		UHWE female	
	ELFS	EU-SILC	ELFS	EU-SILC	ELFS	EU-SILC	ELFS	EU-SILC
Czech Republic	94.9	92.6	44.5	46.6	73.4	70.4	39.5	40.7
Hungary	85.1	84.6	36.5	43.8	66.4	71.9	37.6	39.8
Poland	84.7	85.5	44.4	46.4	68.8	69.3	38.8	39.9
Mean	*88.2*	*87.6*	*41.8*	*45.6*	*69.5*	*70.5*	*38.6*	*40.1*
Denmark	93.6	93.5	40.6	41.1	84.5	83.7	34.7	35.2
Norway	92.8	94.1	38.8	42.5	82.9	84.5	31.6	33.6
Sweden	91.5	91.5	40.6	41.8	84.0	82.6	35.1	35.7
Mean	*92.6*	*93.0*	*40.0*	*41.8*	*83.8*	*83.6*	*33.8*	*34.8*
Austria	92.6	92.8	44.6	44.2	74.7	67.1	31.0	31.7
Belgium	91.0	93.1	37.7	44.6	72.3	73.4	29.8	32.7
France	92.7	93.6	42.4	43.4	74.6	75.7	34.0	34.2
Germany	91.1	91.7	41.6	42.7	72.2	69.4	27.2	26.5
Ireland	92.2	88.6	35.7	44.4	63.8	61.9	28.6	29.2
Netherlands	94.6	95.6	40.1	40.8	77.2	69.0	22.9	25.3
United Kingdom	92.3	90.9	44.1	44.8	76.4	77.8	30.4	31.8
Mean	*92.4*	*92.3*	*40.9*	*43.6*	*73.0*	*70.6*	*29.1*	*30.2*
Greece	94.4	94.4	44.9	47.0	58.2	59.2	39.1	38.1
Italy	92.4	93.2	41.3	43.5	55.7	54.7	32.3	34.4
Portugal	92.3	92.1	42.1	44.3	76.5	77.4	38.1	39.6
Spain	91.3	92.5	42.4	44.5	58.9	58.5	34.6	36.1
Mean	*92.6*	*93.0*	*42.7*	*44.8*	*62.3*	*62.4*	*36.0*	*37.1*

samples when these additional selection criteria are applied and when they are not applied. We do that in this subsection.

Table B.9a shows the age composition of the Scandinavian sample in the EU-SILC if all married women aged 25 to 54 (whose education status is non-missing) are included in the columns “No selection”, and the age composition if we focus on married women aged 25 to 54 who also fulfill the additional three selection criteria (no more than 2 married individuals in household, husband aged 25-54, husband’s education status non-missing) in the columns “Selection”. As the table shows, the non-selected sample is on average older than the selected one: the share of 45 to 54 year old married women is on average 40% in the non-selected sample, and 32 in the selected sample. This difference arises because many older women are married to men older than 54, and thus not part of the selected sample.

As Table B.9b shows, this different age composition in the two samples has however almost no effect on the educational composition, which is quite similar between both samples in all three Scandinavian countries. Moreover, and even more reassuringly, the employment rates and usual hours worked for both men and women are virtually unchanged whether the stricter sample selection criteria are applied or not, as Table B.9c shows. Therefore, we conclude that the application of slightly different sample selection criteria

Table B.9: Effect of Scandinavian Sample Restrictions in EU-SILC

(a) Age Composition

	Age: 25-34		Age: 35-44		45-54	
Country	No selection	Selection	No selection	Selection	No selection	Selection
Denmark	20.7	24.2	39.8	45.3	39.5	30.5
Norway	20.5	22.4	39.4	44.4	40.1	33.1
Sweden	21.4	24.8	37.6	43.4	40.9	31.8
Mean	*20.9*	*23.8*	*39.0*	*44.4*	*40.2*	*31.8*

(b) Educational Composition

	Low		Medium		High	
Country	No selection	Selection	No selection	Selection	No selection	Selection
Denmark	20.2	17.1	44.5	46.1	35.3	36.8
Norway	14.3	13.5	46.8	46.3	38.9	40.2
Sweden	9.0	7.6	49.0	49.1	42.0	43.3
Mean	*14.5*	*12.7*	*46.7*	*47.1*	*38.8*	*40.1*

(c) Labor Supply Measures

	ER male		**UHWE male**		**ER female**		**UHWE female**	
Country	No selection	Selection	No selection	Selection	No selection	Selection	No selection	Selection
Denmark	93.5	94.2	41.1	41.1	83.7	84.7	35.2	35.3
Norway	94.1	94.8	42.5	42.4	84.5	85.2	33.6	33.6
Sweden	91.5	92.1	41.8	41.8	82.6	83.1	35.7	35.6
Mean	*93.0*	*93.7*	*41.8*	*41.8*	*83.6*	*84.3*	*34.8*	*34.8*

in the ELFS for Scandinavian countries has likely no major effect on our labor supply measures.

B.7.3 Construction of Wages in the EU-SILC

For comparability reasons, we cap hours and earnings in the EU-SILC as in the CPS, and then construct hourly wages by dividing gross monthly individual earnings by monthly hours. We construct monthly hours by multiplying usual weekly hours with 52 minus vacation/public holiday weeks from external data sources, divided by 12. Last, we drop observations with wages less than half the minimum wage (as in the Review of Economic Dynamics 2010 special issue on cross-country heterogeneity facts, see Krueger et al. (2010) for details), and the top 1% of observations, which are mostly driven by low hours rather than high earnings, and seem to be due to measurement error. The EU-SILC starts in 2004 for 11 out of our 17 European countries, and in 2005 for the remaining 6 countries; we extrapolate wages for the missing years based on OECD growth rates of mean wages.

Table B.10: Availability of Annual and Monthly Earnings in EU-SILC

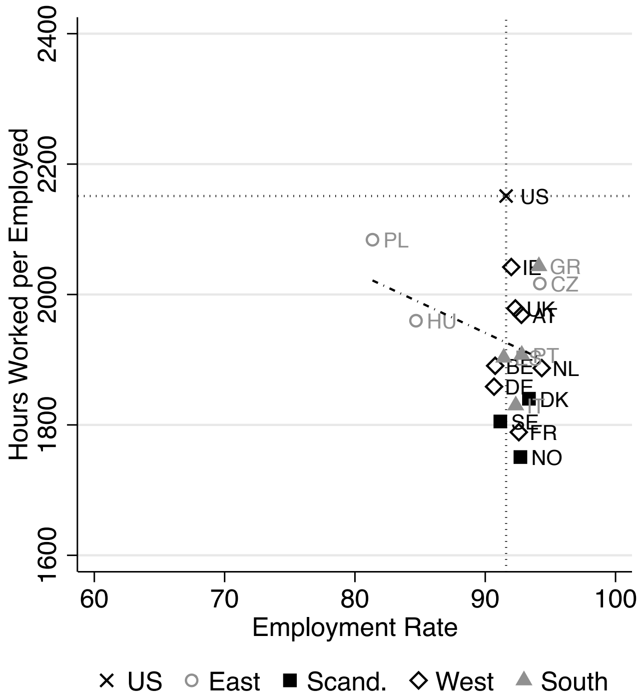
Country	Monthly Earnings	Annual Earnings
Czech Republic	—	2005 - 2008
Hungary	2006 - 2008	2005 - 2008
Poland	2005 - 2008	2005 - 2008
Denmark	—	2004 - 2008
Norway	2004 - 2006	2004 - 2008
Sweden	—	2004 - 2008
Austria	2004 - 2008	2004 - 2008
Belgium	2004 - 2005	2004 - 2008
Germany	—	2005 - 2008
France	—	2004 - 2008
Ireland	2004 - 2008	2004 - 2008
Netherlands	—	2005 - 2008
United Kingdom	2005 - 2008	2005 - 2008
Greece	2004 - 2008	2007 - 2008
Italy	2004 - 2008	2007 - 2008
Portugal	2004 - 2008	2007 - 2008
Spain	2004 - 2008	2006 - 2008
United States	2001 - 2008	—

In general, the EU-SILC provides two types of earnings, namely earnings in the previous month and annual earnings in the previous year. However, the actual availability varies across countries and years, as is summarized in Table B.10. Since each earnings variable is available for at most four or five years (depending from which year onwards the EU-SILC is available for a country), we pick the earnings variable per country for which more years are available. In case of a tie (i.e. in Poland, Austria, Ireland, and the UK), we choose monthly earnings because we also use monthly earnings for our benchmark country, the US, for which we only have a monthly earnings measure. A further disadvantage of the annual earnings is that they refer to the year prior to the interview, while usual hours refer to the current year. To obtain an hourly wage, we take monthly earnings or annual earnings divided by 12, and divide the respective monthly earnings by the product of weekly usual hours (which are available in all years for which we have earnings information) and average monthly weeks worked in a country (52 minus the weeks lost due to vacation days and public holidays, divided by 12).

For years prior to the first sample year, we extrapolate earnings based on country-specific OECD wage growth rates.

B.8 Married Men: Margins of Labor Supply and Education

Figure B.7: Employment Rates and Hours Worked per Employed of Married Men (Ages 25-54)



B.9 Model Inputs

Table B.11: Education Wage Premia, Male Educational Shares, and Correlation Between Education Levels of Wife and Husband

Country	$\frac{w_f^{high}}{w_f^{med}}$	$\frac{w_m^{high}}{w_m^{med}}$	$\frac{w_m^{high}}{w_m^{low}}$	μ_m^{low}	μ_m^{high}	Corr. (Educ$_f$,Educ$_m$)
Czech Republic	1.45	1.49	1.97	4.6	15.6	0.46
Hungary	1.65	1.92	2.43	14.1	16.5	0.55
Poland	2.08	1.66	2.30	9.8	14.8	0.52
Mean	*1.73*	*1.69*	*2.23*	*9.5*	*15.7*	*0.51*
Denmark	1.15	1.26	1.35	20.4	28.8	0.37
Norway	1.14	1.25	1.39	13.4	33.7	0.40
Sweden	1.14	1.25	1.42	15.3	31.0	0.39
Mean	*1.14*	*1.25*	*1.39*	*16.4*	*31.2*	*0.38*
Austria	1.41	1.30	1.61	12.7	21.1	0.39
Belgium	1.33	1.23	1.39	32.0	31.4	0.55
France	1.39	1.29	1.44	28.1	24.8	0.48
Germany	1.24	1.35	1.64	10.8	31.4	0.50
Ireland	1.74	1.45	1.80	35.7	28.6	0.52
Netherlands	1.26	1.39	1.58	25.5	30.7	0.44
United Kingdom	1.36	1.33	1.85	22.1	33.0	0.40
Mean	*1.39*	*1.33*	*1.62*	*23.9*	*28.7*	*0.47*
Greece	1.97	1.38	1.59	38.5	23.2	0.63
Italy	1.39	1.40	1.69	50.7	10.7	0.54
Portugal	1.92	1.70	2.64	78.1	9.6	0.62
Spain	1.63	1.28	1.61	52.0	27.0	0.53
Mean	*1.73*	*1.44*	*1.88*	*54.8*	*17.6*	*0.58*
United States	1.52	1.40	1.97	8.9	43.7	0.54

C Model Appendix

C.1 Some Theoretical Results - Details

Deriving Equation (9)

In order to show the derivation of Equation (9), let us restate the simplified household problem:

$$\max_{h_m,h_f} \ln c - \alpha \sum_{g=m,f} h_g^{1+\frac{1}{\phi}} - q\mathbf{I}_{h_f>0}, \tag{C.1}$$

subject to the following budget constraints under joint taxation (j)

$$c^j = 2\frac{1-\delta}{1+\tau_c}\left(\frac{w_m h_m + w_f h_f}{2}\right)^{1-\zeta} + T^j \tag{C.2}$$

and under separate taxation (s)

$$c^s = \frac{1-\delta}{1+\tau_c}\left[(w_m h_m)^{1-\zeta} + (w_f h_f)^{1-\zeta}\right] + T^s. \tag{C.3}$$

The first order conditions for each spouse under joint taxation, assuming the wife is working, are given by:

$$\frac{2\frac{1-\delta}{1+\tau_c}(1-\zeta)\left(\frac{w_m h_m + w_f h_f}{2}\right)^{-\zeta}\frac{w_g}{2}}{2\frac{1-\delta}{1+\tau_c}\left(\frac{w_m h_m + w_f h_f}{2}\right)^{1-\zeta} + T^j} = \alpha\left(1+\frac{1}{\phi}\right)h_g^{1/\phi}\ \forall\ g = m, f. \tag{C.4}$$

Taking the ratio for both spouses yields the optimal hours gap as a function of wages:

$$\frac{h_m^{*j}}{h_f^{*j}} = \left(\frac{w_m}{w_f}\right)^{\phi}, \tag{C.5}$$

where the * denotes optimal choices. The optimal hours gap depends only on the wage ratio and the curvature of the disutility of working ϕ. Tax progressivity ζ does not affect the hours gap because, as discussed in the main text, both spouses face the same marginal tax rate. This is also true for the measure of the average tax rate δ, which affects both spouses at the margin identically. Obviously, as we discuss further below, the levels of h_m^{s*} and h_f^{s*} generally depend as well on ζ and δ. Repeating the same steps for separate taxation yields

$$\frac{\frac{1-\delta}{1+\tau_c}(1-\zeta)(w_g h_g)^{-\zeta} w_g}{\frac{1-\delta}{1+\tau_c}\left[(w_m h_m)^{1-\zeta} + (w_f h_f)^{1-\zeta}\right] + T^s} = \alpha\left(1+\frac{1}{\phi}\right)h_g^{1/\phi}\ \forall\ g = m, f \tag{C.6}$$

and

$$\frac{h_m^{*s}}{h_f^{*s}} = \left(\frac{w_m}{w_f}\right)^{\phi\frac{(1-\zeta)}{1+\phi\zeta}} \tag{C.7}$$

Under separate taxation, the optimal hours gap also depends on the progressivity of the tax code ζ. Specifically, if the husband's wage exceeds the wife's wage ($w_m > w_f$), the hours gap between the two spouses is decreasing in progressivity. In this scenario the husband faces a higher marginal tax rate than the wife, which depresses his hours relative to her hours, despite his higher wage.

The Effects of the Consumption Tax Rate, Average Tax Rate, Mean Wages, and Transfers on Hours

The qualitative effects of the consumption tax rate, average tax rate, mean wages and transfers on hours worked in our framework are independent of the tax treatment and whether the wife is working or not. For the ease of exposition, we therefore focus on the case of a single-earner household (i.e. only the husband works) under separate taxation, and define the husband's income relative to the mean wage, i.e. $w_m = \bar{w}\gamma$. In analogy to our decomposition exercise, we assume that the non-linearity of the income tax code is independent of the mean wage, but only depends on where an individual's earnings are in the wage distribution, i.e. $y^{net} = (1-\delta)\bar{w}(\gamma h_m)^{1-\zeta}$.[6] Under these assumptions, we can rewrite the husband's first order condition as:

$$h_m^{s*} = \left[\frac{1-\zeta}{\alpha\left(1+\frac{1}{\phi}\right)} - T^{s*} \frac{1+\tau_c}{\bar{w}} \frac{1}{(1-\delta)\gamma^{1-\zeta}} h_m^{s*\frac{1+\phi\zeta}{\phi}} \right]^{\frac{\phi}{1+\phi}}, \tag{C.8}$$

and the equilibrium transfer is given by

$$\begin{aligned} T^{s*} &= \frac{\lambda}{1+\tau_c} \left[\bar{w}\gamma h_m^{s*} - (1-\delta)\bar{w}(\gamma h_m^{s*})^{1-\zeta} + \tau_c \bar{w}\gamma h_m^{s*} \right] \\ &= \lambda \frac{\bar{w}}{1+\tau_c} \left[\gamma h_m^{s*}(1+\tau_c) - (1-\delta)(\gamma h_m^{s*})^{1-\zeta} \right]. \end{aligned} \tag{C.9}$$

Recall that he household does not take into account that its choices affect the equilibrium transfer, but takes the transfer as given. Still, the equilibrium level of the transfer pins down the level of the equilibrium choices. Hence, plugging the equilibrium transfer Equation (C.9) into the first order condition Equation (C.8), we end up with the following optimality condition:

$$\begin{aligned} h_m^{s*} &= \left[\frac{1-\zeta}{\alpha\left(1+\frac{1}{\phi}\right)} - \lambda \frac{\gamma h_m^{s*}(1+\tau_c) - (1-\delta)(\gamma h_m^{s*})^{1-\zeta}}{(1-\delta)\gamma^{1-\zeta}} h_m^{s*\frac{1+\phi\zeta}{\phi}} \right]^{\frac{\phi}{1+\phi}} \\ &= \left[\frac{1-\zeta}{\alpha\left(1+\frac{1}{\phi}\right)} - \lambda \left[\frac{1+\tau_c}{1-\delta}\gamma^{\zeta} - h_m^{s*-\zeta} \right] h_m^{s*\frac{1+\phi+\phi\zeta}{\phi}} \right]^{\frac{\phi}{1+\phi}}. \end{aligned} \tag{C.10}$$

The key take aways from Equation (C.10) are: first, the mean wage $\bar{w}$ does not affect the optimal hours

[6]Note that this slight modification does not change the conclusion drawn in the main text from Equation (9), or for the hours gaps under joint and separate taxation in the previous subsection. All that matters is the relative position of husband and wife in the wage distribution: $\frac{w_m}{w_j} = \frac{\gamma_m}{\gamma_f}$.

choice. Since the government revenues are proportional to the mean wage, income and substitution effects cancel out exactly. This backs up our claim that international differences in mean wages do not affect cross-country differences in hours worked in our exercise. In the next subsection we will extend this argument to a woman's choice of whether to work or not work. Second, the consumption tax rate τ_c, the measure of the average tax rate δ, as well as the individual's position in the income distribution γ (interacted with tax progressivity) affect the optimal hours choice only in the presence of a positive transfer, i.e. if $\lambda > 0$. Without a transfer, the income and substitution effect of all these elements cancel out exactly. Note that the consumption tax rate τ_c and the measure of the average tax rate δ affect the optimal hours choice qualitatively in a similar way. Last, tax progressivity ζ itself as well as preferences over leisure (α, ϕ) determine the optimal choice whether there is a transfer or not.

The Mean Wage and Womens' Participation Choice

Even though the optimal hours choice for women conditional on working does not depend on the mean wage, one might worry that the participation choice does so because of the presence of the fixed cost. In the following, we demonstrate for the case of separate taxation that this is not the case. The same logic carries over to the case of joint taxation. The argument again relies on the assumption that the non-linearity of the income tax code is independent of the mean wage, but only depends on where an individual's earnings are in the wage distribution, i.e. $y^{net} = \bar{w}(1-\delta)\left[(\gamma_m h_m)^{1-\zeta} + (\gamma_m h_f)^{1-\zeta}\right]$. As in the previous subsection, the equilibrium transfer itself is proportional to the mean wage:

$$T^{s*} = \lambda \frac{\bar{w}}{1+\tau_c}\left[(1+\tau_c)\left\{\gamma_m h_m^{s*} + \gamma_f h_f^{s*}\right\}(1+\tau_c) - (1-\delta)\left\{(\gamma_m h_m^{s*})^{1-\zeta} + (\gamma_f h_f^{s*})^{1-\zeta}\right\}\right] \equiv \lambda \frac{\bar{w}}{1+\tau_c}\Gamma^{s*}, \tag{C.11}$$

where again the * denotes the optimal hours choice. We can now define the household utility if the wife is working at both spouses' optimal hours choices (using $\tilde{}$ for the optimal hours choice if both spouses are working positive hours) evaluated at the corresponding equilibrium transfer:

$$\begin{aligned} U^w(\tilde{h}_m, \tilde{h}_f) = & \ln\left(\bar{w}(1-\delta)\sum_{g=m,f}(\gamma_g \tilde{h}_g)^{1-\zeta} + \lambda \frac{\bar{w}}{1+\tau_c}\tilde{\Gamma}^s\right) - \alpha \sum_{g=m,f} \tilde{h}_g^{1+\frac{1}{\phi}} - q \\ = & \ln \bar{w} + \ln\left((1-\delta)\sum_{g=m,f}(\gamma_g \tilde{h}_g)^{1-\zeta} + \lambda \frac{1}{1+\tau_c}\tilde{\Gamma}^s\right) - \alpha \sum_{g=m,f} \tilde{h}_g^{1+\frac{1}{\phi}} - q. \end{aligned} \tag{C.12}$$

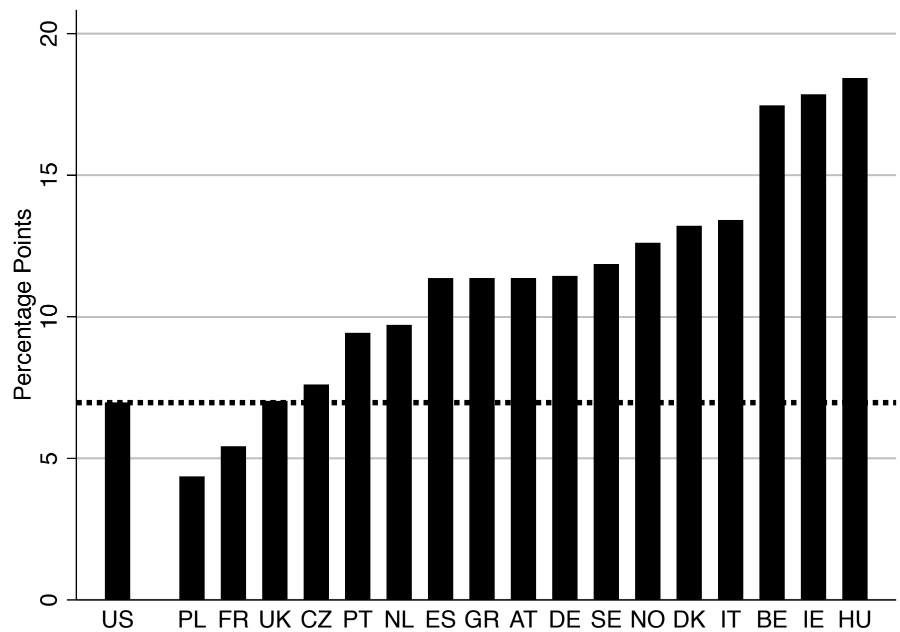
The household utility if the wife is not working at the husband's optimal hours choice conditional on her not working (using $\hat{}$ for the optimal hours choice if only the husband provides positive hours) evaluated at the corresponding equilibrium transfer is:

$$\begin{aligned} U^{nw}(\hat{h}_m, 0) = & \ln\left(\bar{w}(1-\delta)(\gamma_m \hat{h}_m)^{1-\zeta} + \lambda \frac{\bar{w}}{1+\tau_c}\hat{\Gamma}^s\right) - \alpha \hat{h}_m^{1+\frac{1}{\phi}} \\ = & \ln \bar{w} + \ln\left((1-\delta)(\gamma_m \hat{h}_m)^{1-\zeta} + \lambda \frac{1}{1+\tau_c}\hat{\Gamma}^s\right) - \alpha \hat{h}_m^{1+\frac{1}{\phi}}. \end{aligned} \tag{C.13}$$

The woman participates if $U^w(\tilde{h}_m, \tilde{h}_f) > U^{nw}(\hat{h}_m, 0)$, which is independent of the mean wage. Hence, in our framework cross-country differences in mean wages are neither relevant for extensive nor intensive margin choices.

C.2 Tax Progressivity

Figure C.1: Model Inputs - Tax Progressivity



Note: The figure shows the difference in $\tau_l(0)$, i.e. the average tax rate for a married couple when the wife is not working and the husband works the mean male married hours worked in the US, between husbands earning 1.67 times the average wage and 0.67 times the average wage.

C.3 Untargeted Moments and Time-Series Performance of the Model

Figure C.2: Time-Series Predictions for the US

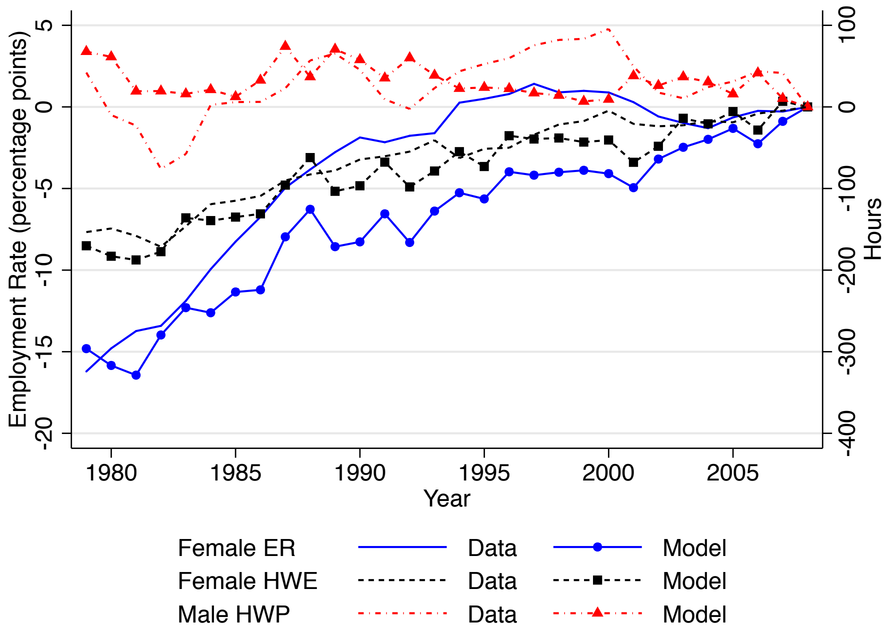


Table C.1: Untargeted Moments

	Data	Model	$\Delta_{\text{Model-Data}}$
Hours Worked per Man			
Low education	1648.6	1949.0	300.4
Medium education	1922.0	1976.1	54.1
High education	2092.2	2043.9	−48.3
Hours Worked per Employed Woman			
Low education	1682.9	1529.9	−153.0
Medium education	1739.8	1660.6	−79.2
High education	1757.6	1770.3	12.7

C.4 Alternative Specifications

We carry out five different robustness checks. In each of them, we recalibrate the model to match the targeted US moments.

In a first robustness check, we focus on households without children. As discussed in Section B.4, differences in hours worked relative to the US are not primarily driven by the different labor force behavior of women with children. In Table C.2, we present the data and model results focusing on women without children. The data change a bit when focusing on childless married men and women, but the overall patterns remain the same. The model predicts a bit smaller differences to the US of hours worked of married women in Eastern and Southern Europe when we simulate only households without children, which results in a small overall decline in the predicted Europe-US hours gap. At the same time, it improves the within-European fit of married women's hours worked.

Table C.2: Hours Worked per Married Person in Data and Model - Childless Couples

	Eu.-US Hours Gap (all in %)			Variation within Europe	
	Data	Model	Fraction Explained	Correlation	Regr. Slope
Men	−10.7	−4.4	40.9	0.32	0.26
Women	−20.0	−15.4	76.9	0.69	0.52

Note: The table excludes the Scandinavian countries because the ELFS does not have household identifiers for those three countries. Column 1 shows the Europe-US hours differences in % in the data, and column 2 the corresponding difference in the model. Column 3 shows the fraction of the data explained by the model. Column 4 indicates the cross-country correlation of model and data hours, and column 5 the slope of a regression line of model predicted hours on data hours, both times excluding the US.

A second robustness check changes the curvature parameter ϕ of the disutility of working only for women to 1 and 1.5, respectively, thereby increasing the female labor supply elasticity. We leave the value for men at 0.5. The second and third rows of Table C.3 show the results, while the first row repeats the benchmark results. Changing the female elasticity has almost no effect on male labor supply. For married women, increasing the elasticity increases the effects of any cross-country factors, and therefore increases the difference between hours worked in the US and Europe. This leads to a slightly worsened fit for Scandinavia and Eastern Europe, but an improved fit for Western and Southern Europe, leaving the overall within-Europe fit almost unchanged.

In a third robustness check, we vary the redistribution scheme of government revenues. In the benchmark analysis, we assume full redistribution, while here we consider two alternative redistribution schemes: first, the alternative extreme of no redistribution, i.e. $\lambda^i = 0$, or secondly, a specification similar to the one used by Prescott (2004), namely setting λ^i equal to 1 minus twice the share of expenditures on military from all government expenditures. Redistribution matters in the analysis, because the redistribution of tax revenues in a lump-sum fashion to households provides important income effects that lower the incentives to work. As the fourth row of Table C.3 shows, going from the benchmark redistribution to the country-specific redistribution scheme used by Prescott (2004) decreases hours worked for men and women in Europe relative

Table C.3: Robustness Checks - Hours Worked per Married Person (% difference to the US)

	Men		Women				
Experiment	Model	% Expl.	Model	% Expl.	Corr.	Regr. Slope	Corr. (HWP_m, HWP_f)
Benchmark	−6.5	57.7	−15.7	88.4	0.43	0.27	0.33
$\phi^f = 1.0$	−6.3	56.0	−18.5	104.3	0.43	0.32	0.42
$\phi^f = 1.5$	−5.9	52.4	−20.1	113.1	0.44	0.36	0.40
$\lambda^{Prescott}$	−7.5	66.5	−18.7	105.1	0.44	0.28	0.35
$\lambda = 0$	−2.8	24.6	−6.2	34.8	0.53	0.43	−0.33
Raw Wages	−6.9	61.6	−13.6	76.6	0.08	0.05	0.49
Wage Heterogeneity	−4.8	42.8	−8.5	48.1	0.36	0.21	0.43

to the US more than in the benchmark. Due to the higher military expenses in the US than in Europe, a lower share of government revenues is redistributed in the US, which makes the income effect of high taxes via transfers relatively larger in Europe. The within-Europe fit and the correlation between male and female labor supply remain almost unchanged. A scenario with no redistribution of government revenues as presented in the fifth row, on the other hand, leads to significantly higher predicted hours worked in Europe. Two effects lead to higher predicted hours in Europe in the model without transfers, compared to the benchmark model: first, in the benchmark scenario, the income effect from redistribution is on average larger in Europe than in the US due to higher taxes and therefore higher government revenues in Europe. This leads to larger disincentive effects on labor supply from redistribution in Europe than in the US, which are absent in the case of no redistribution. Second, given our assumption of log utility, substitution and income effects of changes in consumption tax rates and average labor income tax rates cancel out in the absence of transfers. As a consequence, cross-country differences in consumption tax rates and average income tax rates do not affect household choices anymore. Hence, disincentive effects from these higher European tax rates are no longer present in the case of no redistribution. All results are now only driven by cross-country differences in the educational composition, gender-education-wage premia, and the tax structure. While the predicted Europe-US hours gap is significantly smaller in the model without transfers, the within-Europe variation is explained slightly better by this specification. Moreover, the predicted correlation between hours worked of married men and women falls and even becomes negative with a value of -0.33. This indicates that a significant part of the positive correlation of 0.33 in the baseline model stems from two sources: first, the qualitatively similar income effect of transfers on hours worked of married men and women; secondly, the qualitatively similar effect of consumption and average labor income tax rates on hours worked of married men and women, which only unfolds in the presence of transfers.

The fourth robustness check uses raw observed female wages rather than the wages computed with the Heckman correction for women as model inputs. Wages for men are unchanged. Results are in row 6 of Table C.3. Predicted hours for European married men decrease slightly when raw wages are used as model inputs, increasing the model fit. For women, predicted hours in Europe are slightly higher in Eastern and Western Europe when raw wages are used, but lower in Scandinavia. Quantitatively, these effects are relatively small, which is however not the case for Southern Europe, where the predicted difference in hours worked of married women to the US is approximately only half the size if raw wages are used. This results in an overall decrease in the predicted Europe-US hours gap for married women, and a significantly worsened within-Europe fit. It is not surprising that the largest differences arise for Southern Europe, which has the lowest female employment rates in the data. Therefore, selection into work is the biggest issue for countries in Southern Europe. A positive selection leads to higher observed than offered wages and thus a lower gender wage gap, which can explain the higher predicted hours of Southern European women when observed wages are used as model inputs.

In the last robustness check, we allow for further wage heterogeneity within each education group. Since we impute wages from the EU-SILC, we also impute the distribution of wages from EU-SILC. Similar to Attanasio et al. (2008), we obtain an estimate of wage heterogeneity for men only, and apply the same estimates for women. For each country, we regress male log hourly wages on a set of year and education dummies. We pool individuals from all years and education groups to have a sufficiently large sample. For each education group we calculate the standard deviation of the residuals from our regression as our country-education-specific measure of wage heterogeneity, which we discretize into three states (using five rather than three states has virtually no impact on our results). When individuals are matched into couples, we draw randomly from these states within each education type. The last row of C.3 shows the main results in the model with wage heterogeneity conditional on education. Compared to the benchmark model, the fit within Europe decreases only slightly, and the correlation of hours worked of men and women increases slightly. Most importantly, with heterogeneity hours in all European regions are higher for both men and women, such that less of the US-Europe hours gap is explained. All four model inputs contribute to the higher European hours with heterogeneity, and not surprisingly, wages have the largest effect.

Table C.4: Linear Taxes - Hours Worked per Married Person (% difference to the US)

	Men		Women				
Experiment	Model	% Expl.	Model	% Expl.	Corr.	Regr. Slope	Corr. (HWP_m, HWP_f)
Benchmark	−6.5	57.7	−15.7	88.4	0.43	0.27	0.33
Linear Taxes	−7.8	69.7	−27.8	156.5	0.28	0.16	0.54

C.5 Linear Taxes

One major novelty of our study is that we use actual non-linear tax systems rather than average marginal tax rates as model inputs in order to predict hours worked. To understand how important this is, we compare our benchmark results to results from the same model using the same model inputs but replacing the non-linear labor income taxes with linear income taxes calculated by McDaniel (2011) as model inputs.[7] As in the previous section, we recalibrate the model with linear taxes to match the targeted US moments.

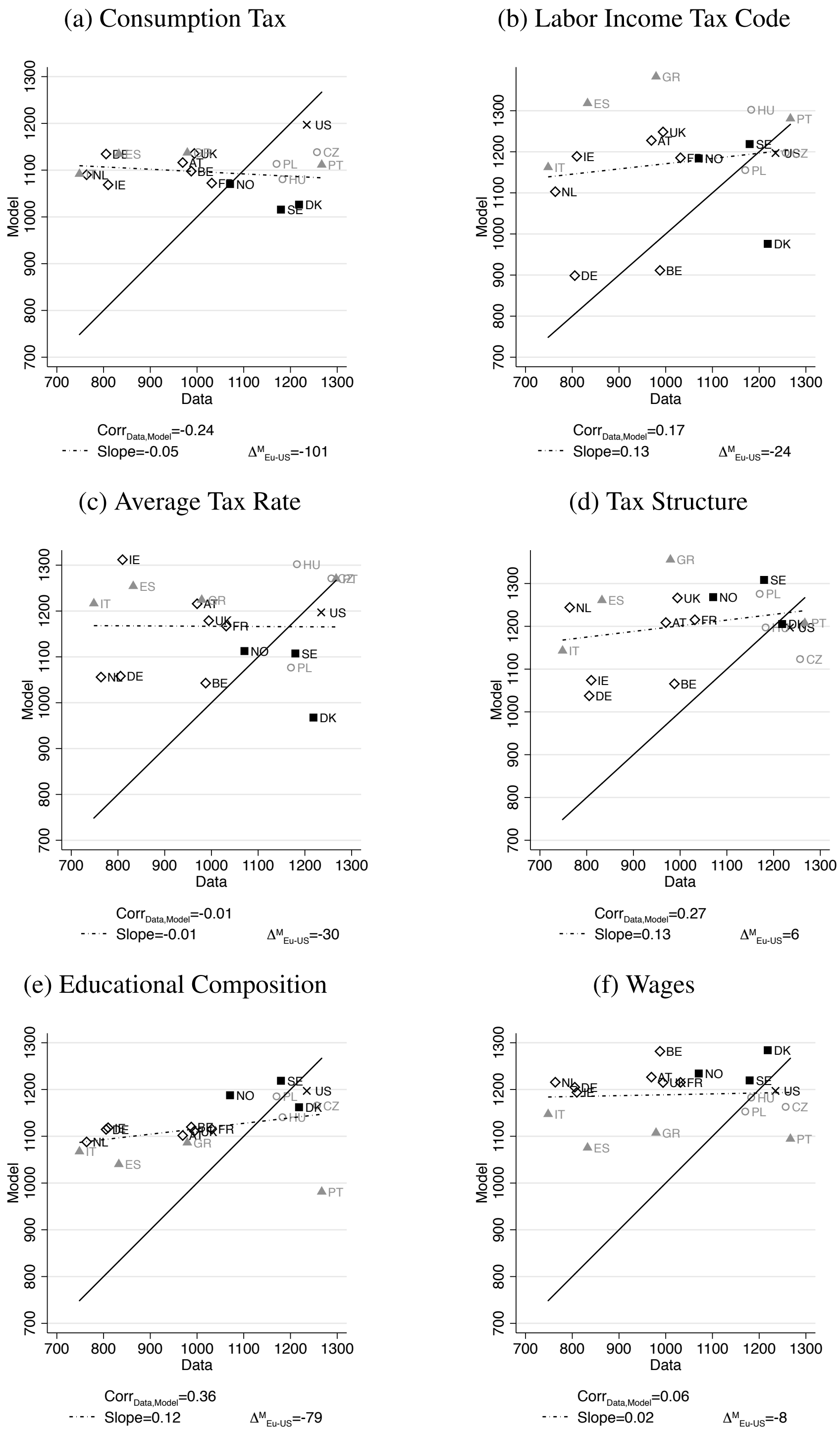
As Table C.4 shows, the fit for married men improves somewhat when we use simple linear labor income taxes. On average 70% of the US-Europe gap is explained with linear taxes, compared to 58% with non-linear taxes. Since married men make up the majority of the workforce, average labor income tax rates capture their actual income tax rates quite well, and therefore the predictions are not that different whether we use the full schedule of non-linear or simple linear labor income taxes.

For women, however, results are very different whether we use the actual non-linear tax code or simple linear taxes. The model with linear taxes predicts significantly larger hours worked differences between Europe and the US than the model with the actual non-linear tax code. The countervailing effects of the tax structure are missing when we use simple linear tax rates. Therefore, the predicted Europe-US hours gap is 57% *larger* than the one in the data. Moreover, the model with linear tax rates does a worse job in explaining the within-Europe cross-country differences: both regression slope and correlation are lower than in the benchmark case. Last, the correlation between hours worked of married men and women is significantly larger if linear taxes are used as model input. The international variation in jointness of taxation is a significant driver of the low correlation in the benchmark model. This driver however disappears if progressivity is abolished and linear taxes are used as model inputs, since after abolishing progressivity there is no longer any distinction between joint and separate taxation.

[7] Prescott (2004), McDaniel (2011) and Ragan (2013) multiply average labor income tax rates (but not social security contribution rates) by a factor of 1.6 in order to convert them into average marginal tax rates. Ohanian et al. (2008) do not multiply the labor income taxes by 1.6.

C.6 Decomposition Results for Married Women

Figure C.3: Decomposition – Individual Country-Specific Results for Hours Worked of Married Women



Note: In each panel of the figure, only one model feature is set to the country-specific level, keeping the others at the US level.

C.7 Additional Decomposition Results for Married Men

Table C.5: Decomposition: Results on Within-European Variation for Married Men

Experiment	Correlation	Regr. Slope
All Country-Specific	0.43	0.47
τ_c	0.51	0.12
τ_l	0.38	0.36
Tax Structure	*0.03*	*0.03*
Avg. Tax Rate	*0.42*	*0.33*
w	0.06	0.02
$\mu(x,z)$	0.35	0.08

C.8 Wedges

Figure C.4: Extensive and Intensive Margin for Married Women: Data vs. Model

(a) Employment Rate (b) Hours Worked per Employed

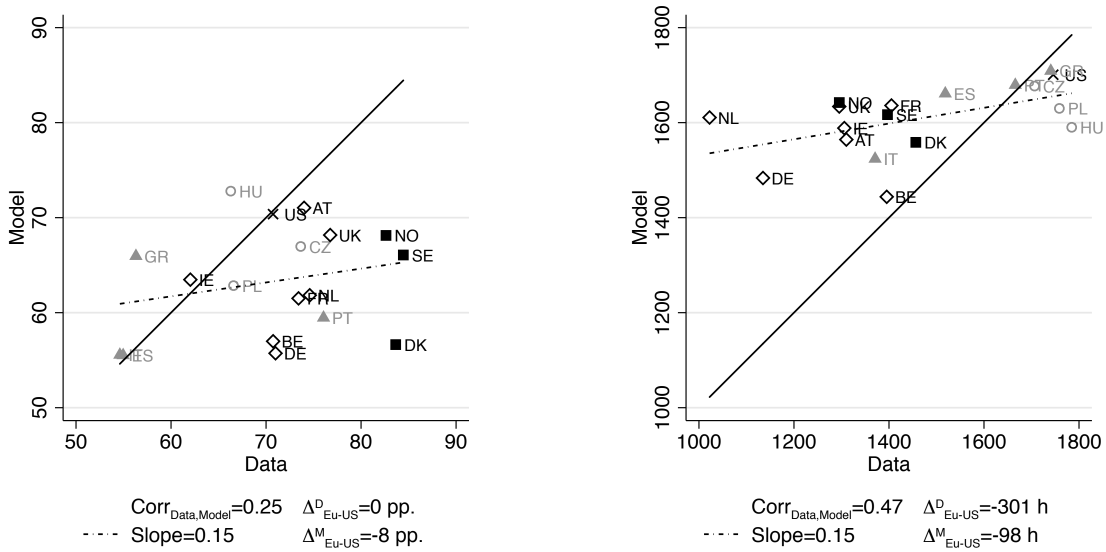
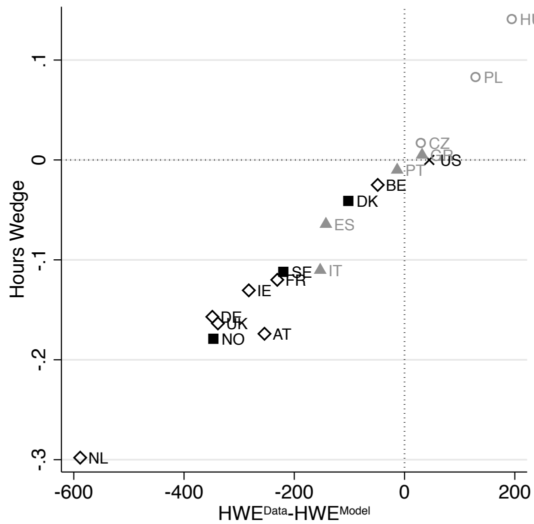
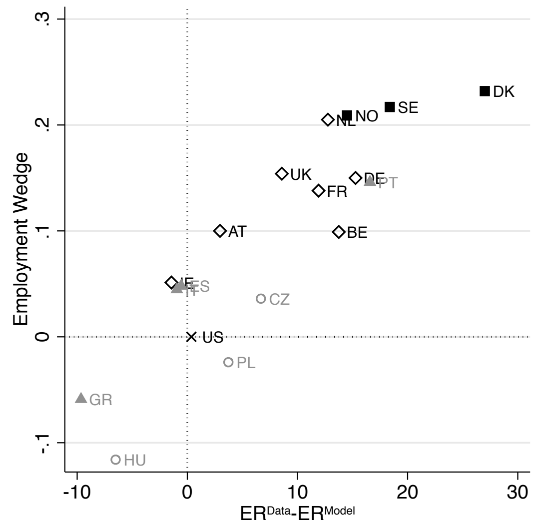


Figure C.5: Country-Specific Wedges and Data-Model Discrepancies

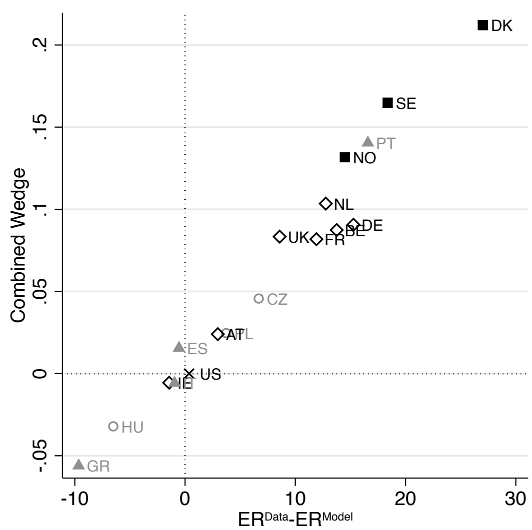
(a) $\hat{\tau}_h$ vs. Female Hours Worked per Employed



(b) $\hat{\tau}_e$ vs. Female Employment Rate



(c) $\hat{\tau}_h \cdot \bar{h}_f + \hat{\tau}_e$ vs. Female Employment Rate



Panel (c) plots for each country the combined wedge on the y-axis, i.e. the employment wedge ($\hat{\tau}_e$) plus the hours wedge ($\hat{\tau}_h$) times the mean female hours worked per employed in the data ($\bar{h}_f$), against the employment rate difference between the predictions of the model without wedges and the data on the x-axis. The combined wedge lines up much more closely with the employment rate difference between the model and the data than the employment wedge alone shown in Panel (b). This is because the hours wedge has an indirect effect on the extensive margin choice, by changing the utility of working a certain amount of hours vis-à-vis the utility of not working.

Table C.6: Wedges and Institutional Factors

Country	$\hat{\tau}_h$	$\hat{\tau}_e$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Czech Republic	0.02	0.04	12	110	50.8	11.0	0.4	43.9	9.1	3.2
Hungary	0.14	−0.12	14	160	43.9	6.0	0.6	30.7	10.2	2.5
Poland	0.08	−0.02	11	26	100.0	7.0	0.3	31.4	25.4	1.5
Mean	*0.08*	*-0.03*	*12*	*99*	*64.9*	*8.0*	*0.4*	*35.3*	*14.9*	*2.4*
Denmark	−0.04	0.23	17	50	53.3	11.0	1.9	0.4	12.5	2.8
Norway	−0.18	0.21	2	87	42.0	17.0	1.0	5.4	11.3	2.3
Sweden	−0.11	0.22	1	60	63.4	7.0	1.3	1.1	10.8	2.3
Mean	*-0.11*	*0.22*	*7*	*66*	*52.9*	*11.7*	*1.4*	*2.3*	*11.5*	*2.5*
Austria	−0.17	0.10	13	60	68.0	17.0	0.3	42.3	9.7	2.5
Belgium	−0.03	0.10	10	32	40.1	6.0	0.6	22.5	14.4	3.0
Germany	−0.16	0.15	2	58	59.8	14.0	0.4	–	–	2.4
France	−0.12	0.14	4	42	49.5	17.0	1.2	17.7	15.3	2.1
Ireland	−0.13	0.05	9	26	34.7	45.0	0.3	14.6	15.1	0.8
Netherlands	−0.30	0.20	5	42	49.3	13.0	0.6	49.3	8.4	2.0
United Kingdom	−0.16	0.15	15	39	30.9	41.0	0.9	37.3	15.0	2.6
Mean	*-0.15*	*0.13*	*8*	*43*	*47.5*	*21.9*	*0.6*	*30.6*	*13.0*	*2.2*
Spain	−0.06	0.05	16	16	100.0	8.0	0.5	7.7	23.2	1.8
Greece	0.00	−0.06	8	43	54.4	5.0	0.1	46.0	25.4	1.1
Italy	−0.11	0.04	7	48	52.7	–	0.6	41.4	16.0	0.8
Portugal	−0.01	0.15	6	30	67.6	8.0	0.3	33.9	23.9	2.3
Mean	*-0.04*	*0.04*	*9*	*34*	*68.7*	*7.0*	*0.4*	*32.3*	*22.1*	*1.5*
United States	0.00	0.00	18	0	0.0	38.0	0.4	35.0	–	3.4

$\hat{\tau}_h$: Hours Wedge
$\hat{\tau}_e$: Employment Wedge
(1): Part-time generosity rank
(2): Maternity leave: paid weeks
(3): Avg. pay during maternity leave
(4): Net child care costs (% of avg. earnings)
(5): Public child care expenditure (% of GDP)
(6): % of preschool child. in informal care
(7): Avg. hours of informal care for preschool child.
(8): Divorce rate (per 1000 persons per year)

Table C.7: Individual Decomposition With and Without Wedges for Women: Europe-US Hours Gap

	No Wedges		Wedges	
Experiment	Model	% Expl.	Model	% Expl.
τ_c	-8.5	47.7	-7.5	42.2
τ_l	-2.1	11.6	-0.3	1.5
Tax Structure	*0.5*	*-2.7*	*0.8*	*-4.7*
Avg. Tax Rate	*-2.5*	*14.3*	*-1.1*	*6.2*
w	-0.7	4.0	-0.6	3.5
$\mu(x,z)$	-6.7	37.5	-5.2	29.3

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