Quantifying the Disincentive Effects of Joint Taxation on Married Women's Labor Supply

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In many European countries, increasing female labor supply is an explicit policy goal, e.g. to alleviate financial pressure on public social security systems caused by demographic change. At the same time, the stagnating female labor force participation has become a point of discussion in the US (Blau and Kahn, 2013). A large range of policies explicitly aim at establishing equal labor market opportunities across the two genders and increasing female labor supply, e.g. subsidized child care, maternity leave, and part-time regulation. However, one policy instrument that heavily influences labor supply in general is largely neglected in this debate, namely income taxation. Income taxes can influence the labor supply of both spouses in a married couple differentially through elements of joint taxation. While in a system of separate taxation each spouse's marginal tax rate increases only in the own income, in systems of joint taxation one spouse's marginal tax rate increases not only in the *own* income, but also in the *spousal* income. One variant of such a system is e.g. in place in the US. Eissa (1995, 1996) analyzes two tax reform acts in the US in the 1980s that significantly reduced the top marginal income tax rates. In a difference-in-differences setting, she finds that these reforms led to an increase in the labor supply of women married to high-earning husbands.

Relying on a calibrated macro model similar to Kaygusuz (2010), we quantify the disincentive effects of elements of joint taxation in 17 European countries and the US on the labor supply of married couples. Specifically, we investigate how hours of married couples would change if each country moved from the current system of taxation to a system of separate taxation.

Generally, in a tax system featuring joint taxation and progressivity, the marginal tax rate of the primary earner (i.e. in most cases the husband) is *lower* than the one of a single earning the same income, and the marginal tax rate of the secondary earner (i.e. in most cases the wife) is *higher* than the one of a single with the same income. Thus, when a country with some elements of joint taxation moves from the current tax system to a system of completely separate taxation of married couples in our hypothetical tax reform, hours worked of the secondary earner increase, as long as the tax code features progressivity.

In our quantitative analysis, we keep the government revenues collected from married households constant. The results of our analysis thus give a comparative quantitative measure of how strong the effects of joint taxation are in each of our sample countries, leaving the average tax burden of married households unchanged.

I. Model and Calibration

We build a static model with joint decision making within the household to determine married couples' hours worked, as in Kaygusuz (2010). A married household derives positive

utility from consumption c and negative utility from hours worked h of husband (m) and wife (f). Moreover, households draw a utility cost of joint work q, which introduces an explicit extensive margin choice for women: households with utility cost above $\bar{q}$ will optimally choose that the wife does not work. Households face a consumption tax rate τ_c as well as a non-linear labor income tax τ_l, which depends on the gross incomes of husband and wife. The maximization problem of a household is given by

$$(1) \quad \max_{h_m, h_f} \left\{ \ln c - \sum_{g=m,f} \alpha_g h_g^{1+\frac{1}{\phi}} - q\mathbf{I}_{h_f>0} \right\}$$

subject to

$$(2) \quad c = \frac{\sum_{g=m,f} w_g h_g - \tau_l(w_m h_m, w_f h_f)}{1+\tau_c} + T$$

where $\mathbf{I}_{h_f>0}$ takes the value one if the wife works and zero otherwise. T is a lump sum transfer of all government revenues back to the household, which is taken as exogenous by the household.[1]
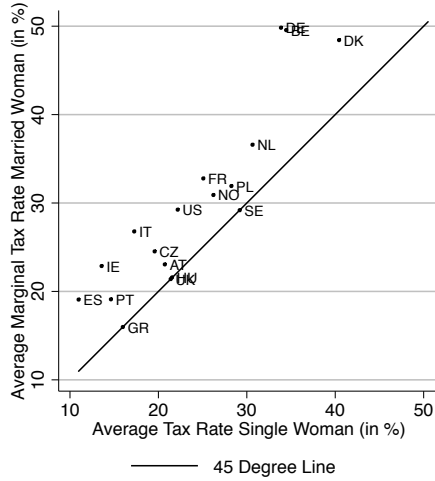
In order to bring the model to the data, we introduce within-country heterogeneity by allowing for three different education levels of husband and wife and gender-education specific wages, and use the actual statutory labor income tax codes from each country. In Bick and Fuchs-Schündeln (2017), we present all details on the model, data sources, and calibration strategy. Moreover, we show that through the lens of this model cross-country differences in consumption and especially non-linear labor income taxes contribute significantly to explaining the observed cross-country differences in hours worked of married men and women in the 2000s prior to the great recession in our sample of countries. In contrast to Bick and Fuchs-Schündeln (2017), we allow here for gender-

specific weights on the disutility of work (α), and also calibrate the preference parameters of the model separately for each country to match country-specific average hours worked per married man, average hours worked per employed married woman, and female employment rates conditional on the husband's and wife's education levels, focusing on childless married couples aged 25 to 54 in the years 2001 to 2008. We abstract in our analysis from children because in our quantitative experiment it would be unclear to which spouse child tax credits should be assigned to, and because many countries grant extra tax benefits or deductions to single parents. On average across all countries, female employment rates in our sample are 75.5% and annual female hours worked per employed are 1577 hours, resulting in annual female hours worked per person of 1187 hours (compared to 1680 hours for men).

The most important model input is the country-specific labor income tax code with its full non-linearity, which we take from the OECD Taxing Wages modules.[2] To demonstrate the potential disincentive effects of elements of joint taxation on married women's labor supply, Figure 1 compares two illustrative measures of country-specific labor income tax rates. On the x-axis, it shows the average tax rate of a single woman working the average hours of US married women. The y-axis shows the average marginal tax rate faced by a woman married to a husband with average earnings if she goes from not working to working the average hours of US married women. It is calculated as the *additional* tax burden that the married couple faces, divided by the woman's income. Both women earn the same country-specific average female

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[1] Our quantitative results in Section II.A are virtually the same as in the other extreme of only wasteful government expenses ($T = 0$).

[2] The OECD Taxing Wages module implements the statutory labor income tax code, including federal, state, and local taxes, employees' social security contributions, cash benefits, as well as standard deductions, by marital status. It calculates a household's net income for any single's earnings and any combination of husband's and wife's earnings, respectively.

Note: The tax rates are calculated for childless married women and singles, assuming that women and men (i.e. husbands in the case of married women) earn the country-gender-specific average wage of married individuals, and work the average hours of US married women and men. The only difference between the calculated tax rates for married and single women comes from the treatment in the tax code.

Figure 1. : Illustrative Tax Rates of Single and Married Women Across Countries

wage and work the same hours (namely the average hours of US married women), so the only difference between them arises due to the differential tax treatment. With separate taxation, the two tax rates coincide, while the stronger the effects of joint taxation, the larger is the difference between both tax rates.

In Greece, Hungary, the UK, and Sweden, the two tax rates are identical, indicating that these countries have systems of separate taxation, at least for average earnings. Germany and Belgium stand out with the largest distance between both tax rates, amounting to 16 and 15 percentage points, indicating a strong interactive effect of joint taxation and tax progressivity. Note that the difference between both tax rates is independent of the level of the average tax rate: while it is highest in Germany and Belgium, which also feature high average tax rates, it is e.g. equally high in Denmark and Spain, the countries with
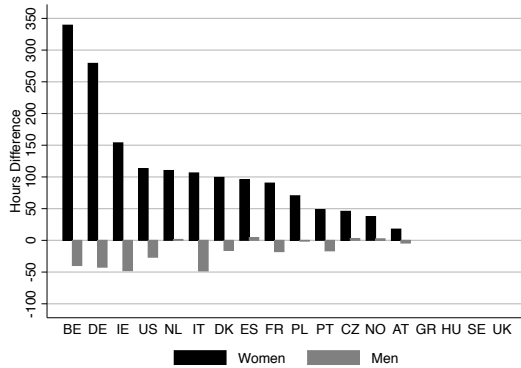
the highest and lowest average tax rate, respectively.
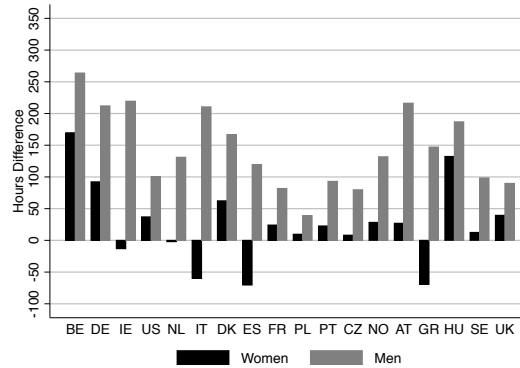
II. Quantitative Results

A. Moving from the Current System to Separate Taxation

Panel (a) of Figure 2 shows the change in hours worked per married woman (black bars) and married man (gray bars) if the respective country switched from the current system of taxation to a system of completely separate taxation of married couples, keeping the average tax burden of married households constant through a linear subsidy/tax. The results of this analysis give a comparative quantitative measure of how strong the effects of joint taxation are in each of our sample countries, leaving the average tax burden of married households unchanged. The respective system of separate taxation is simply the country-specific tax schedule for singles applied to each spouse. As already suggested by Figure 1, in the UK, Hungary, Greece, and Sweden, labor supply of both men and women is completely unaffected by this change, indicating that these countries already have systems of separate taxation. In the remaining countries, labor supply of women increases by abolishing all elements of joint taxation. In Austria, Norway, the Czech Republic, and Portugal, the increase in annual female hours worked is relatively small, ranging from 18 to 48 hours. In Poland, France, Spain, Italy, the Netherlands, the US, Denmark, and Ireland, women would increase their annual labor supply by between 70 and 154 hours a year. For the US, we find that women increase their hours by 113 annually, i.e. 7.8%.[3] The by far largest changes would occur in Germany and Belgium, as suggested by the evidence in Figure 1: women in these two

[3]Our results for the US are quantitatively very similar to the results in Guner, Kaygusuz and Ventura (2012), who carry out a similar analysis in a much richer general equilibrium life-cycle model calibrated to the US economy.

(a) Tax Treatment Effect: Separate vs. Actual System

(b) Progressivity Effect: Linear vs. Separate

Figure 2. : Main Results for Married Couples

countries would increase their hours worked by 280 and 340 annual hours, which corresponds to an increase of 25% and 35%, respectively. This showcases the large disincentive effects that the tax systems in these two countries put on married women through joint taxation. The increase in female hours worked, if present, is in all countries driven by both the extensive and the intensive margin, with the extensive margin being on average more important, explaining 88% of the total increase.

Note that male hours worked decrease in the majority of countries, however only by a maximum of 50 hours. Since men have on average higher wages and do not face a fixed cost of work, their de facto elasticity of hours worked to tax changes is smaller, which lines up with empirical evidence on labor supply elasticities of men and women.

The male-female hours gap thus decreases in all countries when going to a system of separate taxation. With the exception of the four countries featuring already a system of separate taxation, moving from the current tax system to separate taxation increases hours worked by married women on average by 115 hours, or 10.5%,

and decreases male hours by 18 hours, thus leading to an average increase of married couples' total hours of 97 hours annually.[4]

B. Tax Treatment vs. Tax Progressivity

We find relatively large disincentive effects on hours worked of married women through joint elements of taxation in the majority of countries, and only relatively small incentive effects for men. How do these effects compare to the (dis)incentive effects on hours worked coming from progressivity alone? To answer this question, we analyze the change in hours worked caused by a transition from separate taxation (i.e. starting from the result of the previous hypothetical experiment) to *linear* taxation, again keeping average government revenues collected from married couples constant.

As Panel (b) of Figure 2 shows, abolishing progressivity would significantly increase mar-

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[4]With the exception of Italy, government revenues increase after switching to separate taxation. This results in a subsidy for working in our experiment. If we do not hold government revenues constant and thus neglect this subsidy, married couples' hours increase only by 58 after switching to separate taxation (+91 hours for women, -33 hours for men).

ried men's labor supply in all countries, by on average 144 hours. Removing progressivity increases the incentives to work for all individuals who face a higher marginal tax rate than the average tax rate, which is more likely true for men than for women. Therefore, by contrast, for women the predicted changes from abolishing progressivity are in most countries rather small, sometimes positive and sometimes negative, and averaging only 25 hours across countries. Except for the four countries with separate taxation systems and Austria, the predicted increases in hours worked per married woman are always at most half as big as the predicted changes from abolishing elements of joint taxation. Thus, in the majority of countries, the joint elements of taxation are a larger hurdle to increasing female labor supply than the progressivity of the tax system itself. Aggregating over both men and women, moving to separate taxation increases total hours worked of married couples by 97 hours on average over all countries (excluding the four ones featuring separate taxation), and further abolishing progressivity increases hours worked of married couples by 169 hours on average. Thus, the disincentive effects of joint elements of taxation on hours worked of married couples are slightly more than half as large as the effects of progressivity. However, for married women joint elements of taxation play a much larger role as disincentives to work, while for married men the main effect comes through progressivity.

III. Conclusion

We quantify the disincentive effects of elements of joint taxation in the labor income tax codes of 17 European countries and the US by analyzing the extent to which hours worked of married men and women would change if each country switched to a system of separate taxation of married couples, keeping government revenues and thus average tax burdens of married households unchanged. Greece, Hungary,

Sweden, and the UK do not feature any elements of joint taxation. In 10 sample countries, female hours worked would increase by more than 70 hours annually, including 113 hours for the US, 280 hours for Germany, and 340 hours for Belgium. The elements of joint taxation constitute a larger disincentive for the labor supply of married women than the progressivity of the tax system itself, except for the four countries with separate taxation and Austria. Thus, removing these elements is a promising policy if the goal is to increase labor supply of married women.

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