Withheld from Working More? Withholding Taxes and the Labor Supply of Married Women

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  $\Rightarrow$ Increasing WTs does NOT imply higher income taxes!

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$\Rightarrow$ We find that high withholding taxes are detrimental for labor supply

Withholding and Tax Complexity

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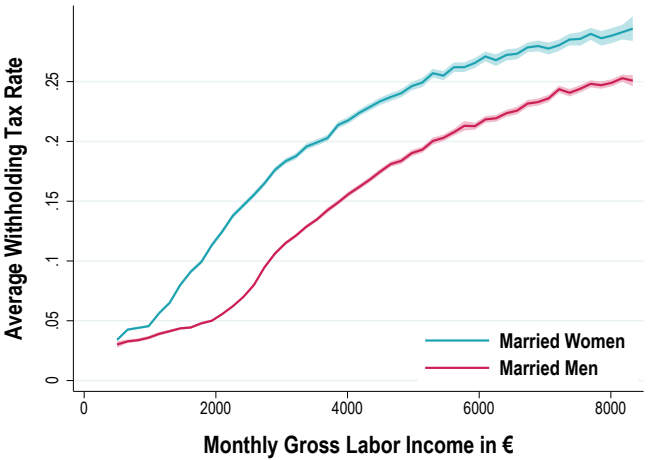
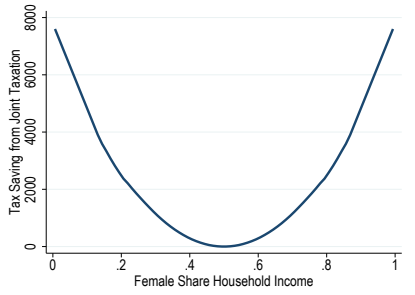
  $\Rightarrow$ **We use observational data to estimate the effect of WTs on labor income**

Institutional Setting

Average Withholding Tax Rate by Gender in Germany



Joint Income Taxation in Germany

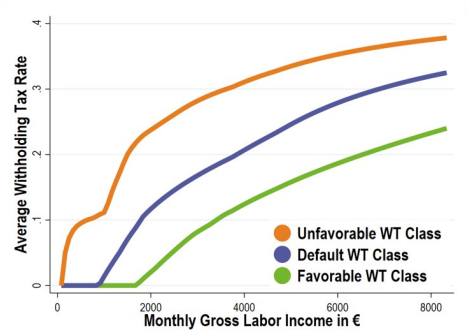


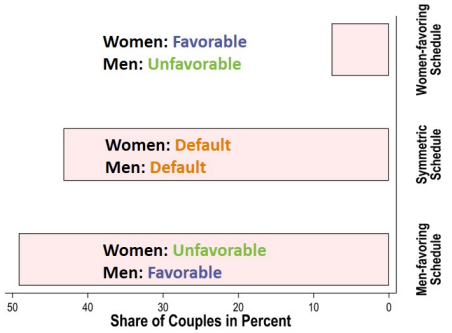
Tax Savings for an Annual HH Income of 80,000 €

- Joint taxation:
  - Induces financial benefits for marriages
  - Reduces the labor supply of secondary earners (Bick and Fuchs-Schündeln, 2017, 2018; LaLumia, 2008; Selin, 2014)

Withholding Taxes in Germany

- Couples can realize joint taxation savings during the year by assigning the **primary earner to the favorable WT class** and the **secondary earner to the unfavorable WT class**





Survey: Exploring the Understanding and Usage of Withholding Taxes

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- Prerequisites: Married, employed and employed spouse

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- **Understanding of interlinkage between WTs and final income tax burden:**
  - Give respondents realistic example of the labor incomes of two spouses (one spouse earning 60,000 € per year, the other one 30,000 €)
  - Ask them to select the WT schedule which results in the lowest final income tax burden of the couple (**correct answer: "does not matter"**)
  - Very scarce knowledge (16 %) about the irrelevance of the WT schedule for the final income tax burden
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$\Rightarrow$ **Possible distortion of labor supply incentives**

Empirical Strategy

How to identify the effect of withholding taxes?

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Problem:

- Choice of WT classes is highly endogenous (dependance on income shown by Buettner et al., 2019)

Descriptive Statistics for the Year 2009

	Men-Favoring	Symmetric
Income Wife	19949.01	33411.34
	(8909.25)	(13820.28)
Income Husband	49192.86	39399.81
	(17347.79)	(15881.09)
Female Income Share	0.29	0.46
	(0.09)	(0.11)
Age Wife	46.9	47.1
	(5.83)	(6.44)
Age Husband	49.16	49.11
	(5.98)	(6.41)
Eastern Germany	0.07	0.34
	(0.26)	(0.47)
Has a Child	0.53	0.24
	(0.5)	(0.43)
Number of Children	1.21	0.64
	(0.94)	(0.82)
Catholic Wife	0.39	0.22
	(0.49)	(0.42)
Catholic Husband	0.37	0.2
	(0.48)	(0.4)
Public Servant Wife	0.12	0.14
	(0.32)	(0.34)
Public Servant Husband	0.22	0.18
	(0.42)	(0.38)
N	11366	11867

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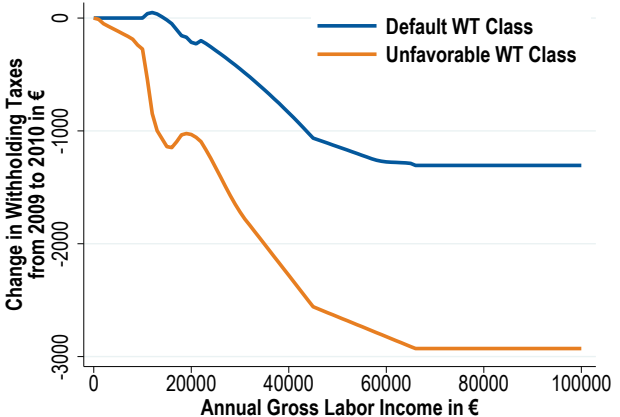
Solution:

- Make use of an exogenous change in the WT rate which affected women in some WT classes more than women in other WT classes

Reform of the Withholding Tax Schedules in 2010



Marginal Tax Rates | Reform Details | Relative Size | No Other Reforms

Treatment Intensity

Percent change in the marginal net-of-withholding-tax rate (NWTR) of wife w induced by the reform

$$\text{Treatment Intensity}_{w,2010} = \frac{\text{NWTR}^{2010}_{w,2009} - \text{NWTR}^{2009}_{w,2009}}{\text{NWTR}^{2009}_{w,2009}}$$

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$\Rightarrow$ Treatment intensity allows the calculation of the elasticity of labor income with respect to the WT

Identification

Idea: Compare women in unfavorable WT class to women in default WT class with similar pre-reform (spousal) incomes and income trajectories

$$\begin{aligned}\text{Log Income}_{i,t} =& \beta \text{Treatment Intensity}_{w,2010} \times \mathbb{1}(\text{Post Reform}_t) \\ &+ \alpha_{c,2009} \times \theta_t + \gamma X_{c,t} + \eta_i + \varepsilon_{i,t}\end{aligned}$$

$\text{Log Income}_{i,t}$	Log income of wife i in year t
β	Percent change in labor income if the marginal NWTR of the woman increases by one percent
$X_{c,t}$	Controls for time-varying characteristics of the couple: Number of children, region of residence, age (squared), ...
η_i, θ_t	Individual and year fixed effects
$\alpha_{c,2009}$	Dense couple-level income cell fixed effects interacted with dummies for parenthood and residence in East Germany

Income Cell Fixed Effects

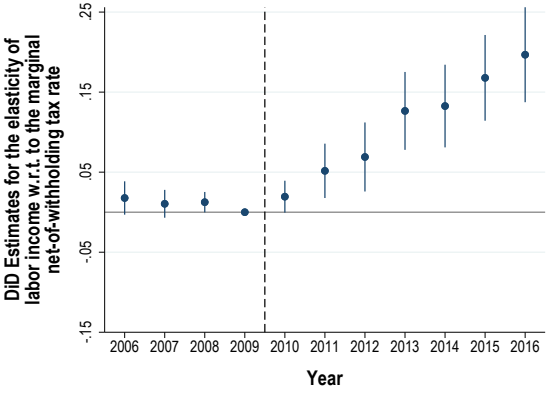
Results

Static diff-in-diff estimates

	Women		Men	
	(1)	(2)	(3)	(4)
DiD Estimate	0.112***	0.099***	0.011	0.007
	(0.020)	(0.020)	(0.011)	(0.011)
Cell FE		✓		✓
N	121,429	121,429	121,429	121,429
Adj. R-Squared	0.334	0.374	0.301	0.317

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Event-study diff-in-diff estimates controlling for income cells



Percent change in female income following a 1 % increase in the marginal net-of-withholding tax rate in 2010

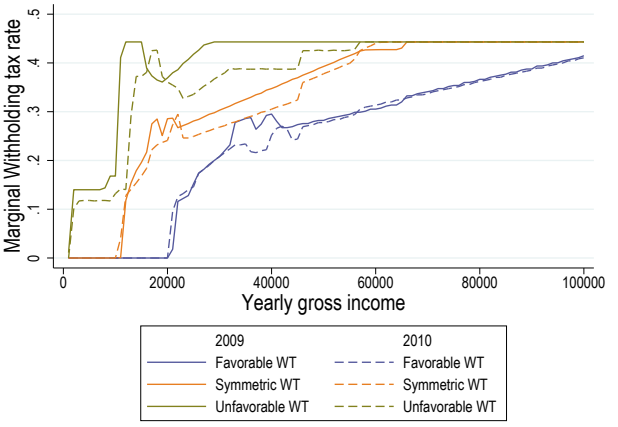
Effect for Men | Unbalanced Panel

Conclusion

- We estimate an elasticity of female labor income *with respect to the WT* of around 0.10 (estimates for ETI w.r.t. income tax range from 0.2 to 0.8; Neisser, 2021)
- Policy implications:
  - The design of withholding taxes matters
  - Having large tax refunds can negatively distort the optimal labor supply decision
  - In the US, nearly a third of personal income tax payments are returned as tax refunds (Gelman et al., 2022), in Sweden almost 80 % receive tax refunds (Engström at al., 2015), in Germany 88 % (Federal Statistical Office)
  - Female labor supply in Germany inefficiently small; contributing to the substantial gender gap in labor incomes

Appendix

Marginal Tax Rates 2009 and 2010



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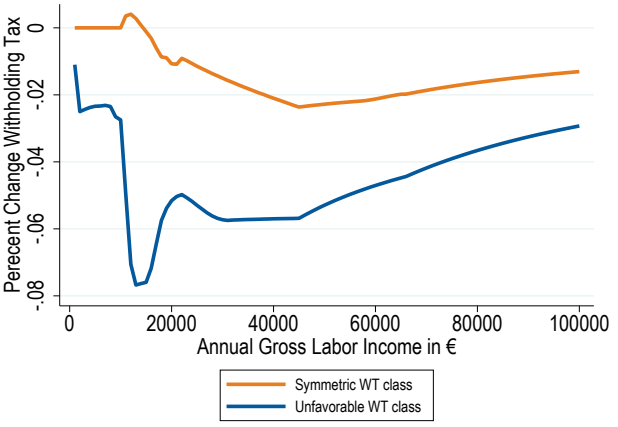
Relative size of the 2010 reform



Return

Details of the 2010 reform

Basic facts income and WT (2009)

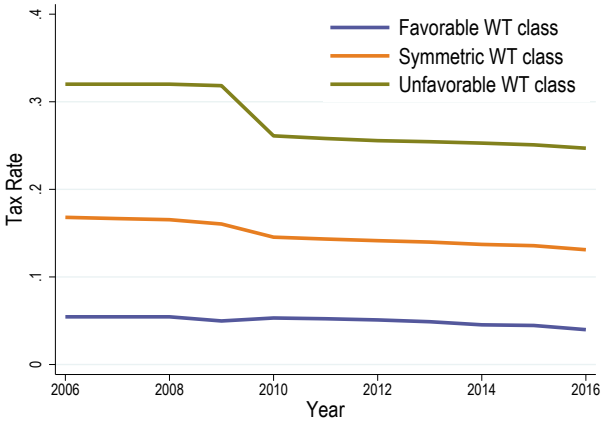
- Deductible contributions to social security are **automatically** deducted from the income tax and WT
- Health care insurance is not completely deductible from income tax and WT
- For **women in men-favoring schedule** and **men in women-favoring schedule**: No deductions from contributions to social security

Reform 2010 ("Bürgerentlastungsgesetz Krankenversicherung")

- Income tax
  - Contributions to health insurance become fully deductible
  - Equivalent to a income tax cut
- Withholding tax
  - For women in men-favoring schedule and men in women-favoring schedule: Social security contributions are completely deductible
  - Large cut of WTs
  - Arguably ex-ante non-salient part of the reform

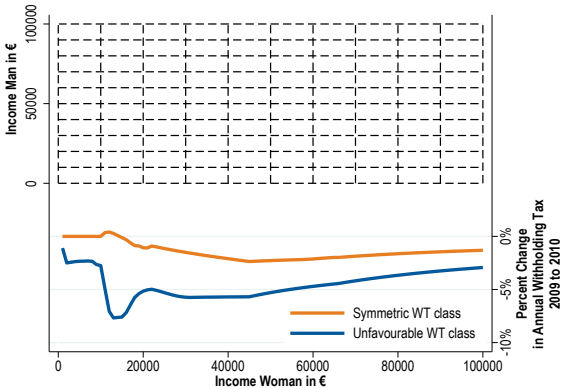
Return

No other substantial reforms between 2005 and 2015



Return

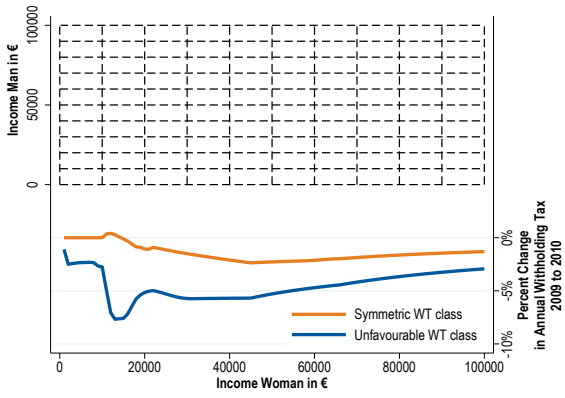
Couple-level income cells (1/2)



- We want to compare couples with similar incomes, similar income tax burden and similar gender norms
- Use cell approach similar to Carbonnier et al. (2022)
- Bin the **2009 incomes** of both spouses and interact bins of spouses with each other
- 10,000 € x 10,000 € income cells

⇒ By adding cells as controls we only use the variation in treatment intensity within each cell

Couple-level income cells (2/2)

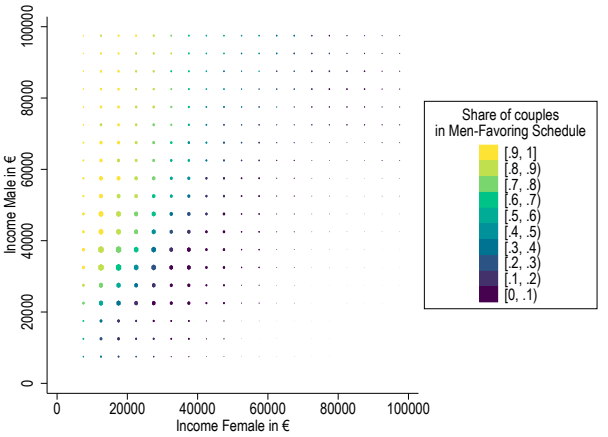


- Along x-axis (female income): Differences in treatment intensity are only induced through withholding tax class
- Along y-axis (male income): Effects of relative income (and thereby gender norms) are accounted for
- Along diagonal: Effects of household income are not driving our results
- Also captures the reform-induced shift in the spousal net-of-withholding-tax rate

⇒ Aim is to only use variation induced by the differing treatment intensity in the different WT classes for otherwise similar individuals.

Treatment Intensity | Exploited Variation | Back

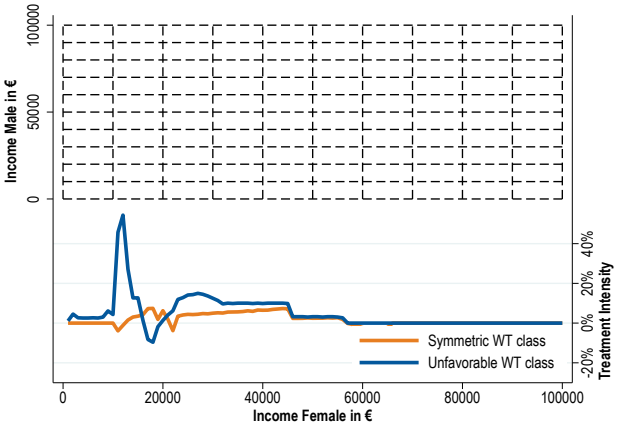
The exploited variation



- **Treatment Group:** Women being in unfavorable withholding tax class at reform date
- **Control Group:** Women being in symmetric withholding tax class at reform date

Return

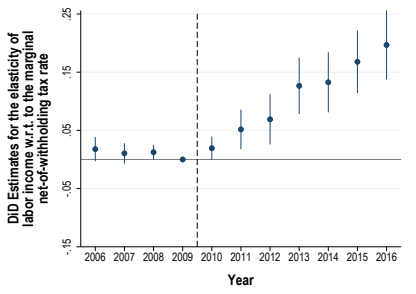
Cells with Treatment Effects



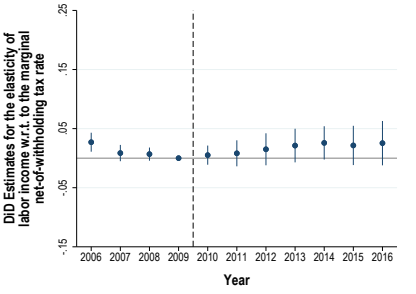
Return

Event-study diff-in-diff estimates for both genders

Elasticity of work income with respect to the female withholding tax



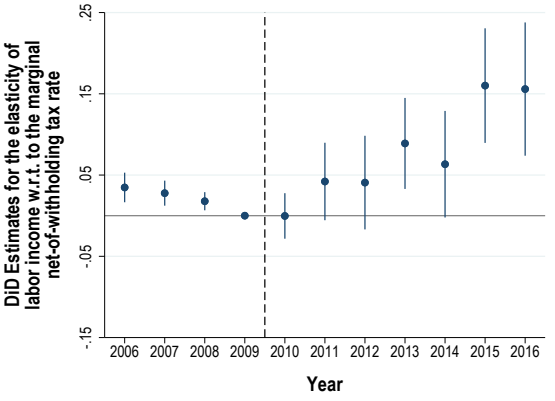
(a) Effect on Female Log Income



(b) Effect on Male Log Income

Back

Event-study diff-in-diff estimates (unbalanced panel)



Percent change in female income following a 1 % increase in the marginal net-of-withholding tax rate in 2010 (based on the unbalanced panel)

Return