How Gender Role Attitudes Shape Maternal Labor Supply

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- Important factor: Different **labor supply choices of parents**

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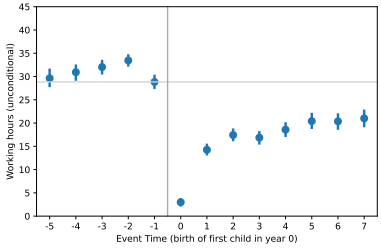
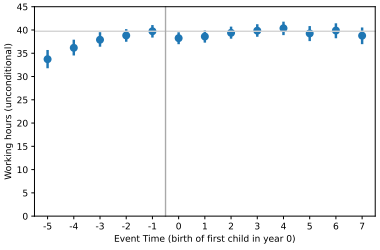
- Working hours around birth of the first child in Germany:



Women



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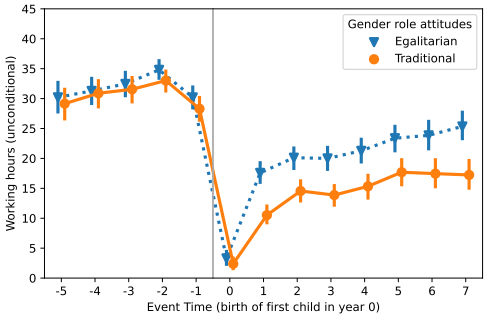

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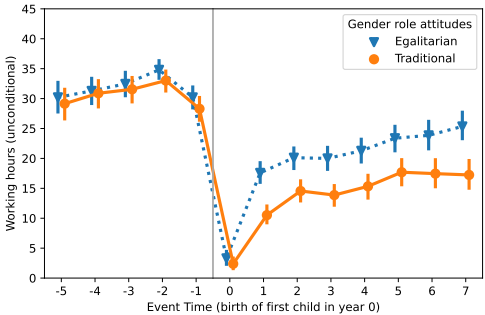

- This project: Use direct measures of **gender role attitudes** to show:
  1. They are strongly related to labor supply of mothers
  2. They **interact with policy changes**

Fix ideas: gender role attitudes

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- Previous evidence (in economics) mostly based on **proxies of gender attitudes** such as country of birth or labor supply of the grandmother

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   - Parents receive subsidy if they do not make use of public childcare
   - Economically: ↑ opportunity costs of childcare on the extensive margin
   - Make use of an eligibility cut-off in a triple-diff strategy

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   - Build state-of-the-art **life-cycle model** of female labor supply
     - Human capital accumulation
     - **Novel feature:** incorporate heterogeneity by gender attitudes
   - Results:
     - Labor supply elasticities larger for traditional mothers
     - Facilitating access to full-time childcare: larger response for egalitarian mothers

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3. Short-run: the potential effectiveness of changes in economic incentives is limited
   - If the policy goal is to increase maternal labor supply, understanding **how policies alter attitudes** is important

Contribution: Combine two strands of the literature

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   a) Primarily based on **proxies of gender attitudes** (e.g., Fernández, Fogli, and Olivetti, 2004; Fernández and Fogli, 2009; Ichino et al., 2023; Lassen, 2023)

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2. **Structural literature on female labor supply**: Tax-transfer system is important (e.g., Blundell et al., 2016; Adda, Dustmann, and Stevens, 2017; Wang, 2022; Jakobsen, Jørgensen, and Low, 2023)
   ⇒ Heterogeneity by gender attitudes

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1. **Data and institutional environment**
2. Gender role attitudes and labor supply around childbirth
3. Interaction with cash-for-care policy
4. A structural model of female labor supply

Appendix

German panel data: pairfam

- 12.000 individuals drawn from register data (+ partners) from 2009 to 2022
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- **Gender role attitudes** elicited for individuals + partners in eight waves:
  - 'How strongly do you personally agree with the following statements?'
  - Five-point Likert scale
    - 'Women should be more concerned about their family than about their career.'
    - 'Men should participate in housework to the same extent as women.' (reverted scale)
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- Build index as standardized average

▸ Details

Predicting (traditional) gender role attitudes

	Gender attitudes index	Women more concerned family than career	Disagreement: Equal housework	Child suffers if mother works
Male	0.22***	0.054***	0.3***	0.31***
	(0.0089)	(0.012)	(0.012)	(0.012)
Age	−0.021***	−0.024***	−0.0066***	−0.032***
	(0.0007)	(0.0009)	(0.001)	(0.0009)
Birth year	−0.024***	−0.03***	−0.015***	−0.027***
	(0.0007)	(0.001)	(0.0009)	(0.001)
Living in East-Germany	−0.12***	−0.015	−0.021	−0.32***
	(0.012)	(0.015)	(0.015)	(0.015)
Education: tertiary	−0.25***	−0.31***	−0.16***	−0.28***
	(0.0094)	(0.012)	(0.012)	(0.012)
Any migration background	0.25***	0.33***	0.13***	0.28***
	(0.012)	(0.015)	(0.015)	(0.015)
Municipality ≥ 100k inhabitants	−0.14***	−0.15***	−0.15***	−0.11***
	(0.01)	(0.013)	(0.013)	(0.013)
Religious affiliation	0.18***	0.18***	0.16***	0.19***
	(0.011)	(0.015)	(0.014)	(0.014)
Observations	74836	74836	74836	74836
Adj. R^2	0.13	0.074	0.049	0.13

Event study sample

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- Classify based on median split of index

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	Gender role attitudes group	
	Egalitarian	Traditional
Education: tertiary	0.56	0.37
	(0.02)	(0.02)
Any migration background	0.13	0.19
	(0.02)	(0.02)
Living in East-Germany	0.36	0.24
	(0.02)	(0.02)
Municipality $\geq$ 100k inhabitants	0.34	0.22
	(0.02)	(0.02)
Religious affiliation	0.61	0.75
	(0.02)	(0.02)
Age at birth first child	30.40	28.90
	(0.21)	(0.24)
Has a partner before birth	0.87	0.84
	(0.02)	(0.02)
Has a married partner before birth	0.46	0.47
	(0.02)	(0.02)
Wage before birth	15.23	13.23
	(0.35)	(0.41)
N subjects	434	405

▸ Household composition over time

Institutional environment

- High female part-time rate (37%, OECD avg: 25%)
- Comprehensive welfare and family transfers
- Remaining Δ between East Germany (former socialist part) and West Germany

▸ More details

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Empirical strategy 1

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- Interact event dummies with gender attitude type

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For individual i in year s and event time t:

$$Y_{ist} = \alpha + \beta \cdot traditional_i + \sum_{k \neq -1} \mathbb{I}[k = t] \cdot (\gamma_k + \delta_k \cdot traditional_i) + \underbrace{\phi_{age_{is}} + \psi_s}_{\text{age and year FE}} + v_{ist}$$

- **Diff-in-diff setup** with left-out time dummy -1 and left-out gender attitude type 'egalitarian'
- **Parameter of interest** δ_k: diff. between traditional and egalitarian mothers at time k

Empirical strategy 2

- For both groups: Estimate the **impact of the first child** under identification assumption:
  - Counterfactual outcome at event time t if person had no children $\approx$ outcome at event time -1 (conditional on controls)

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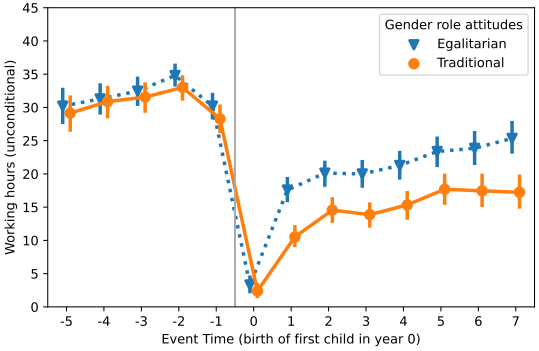
- Notes:
  - Measured effect does not include anticipatory pre-birth effects of the first child
  - It includes effect of additional children
  - Will discuss interpretation of observed Δ by gender attitudes later

Working hours (unconditional)



Raw means by event time

Event study difference (δ_k)

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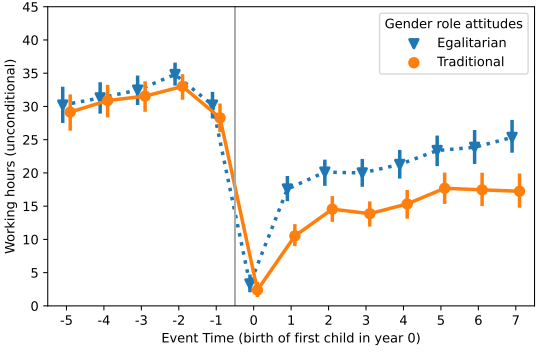

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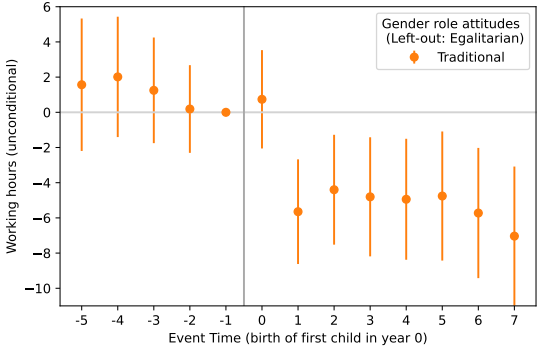

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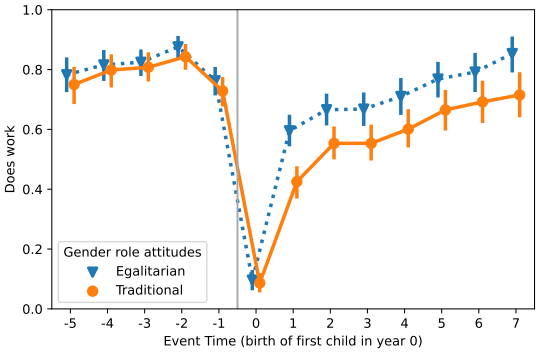
Extensive margin: labor force participation



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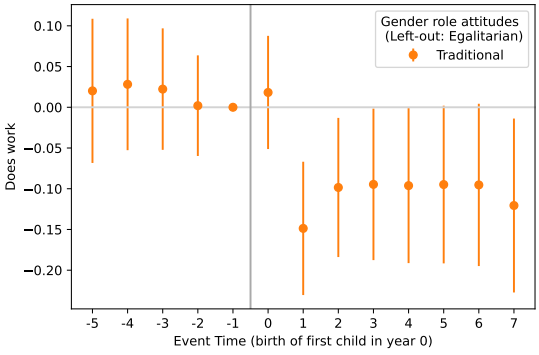
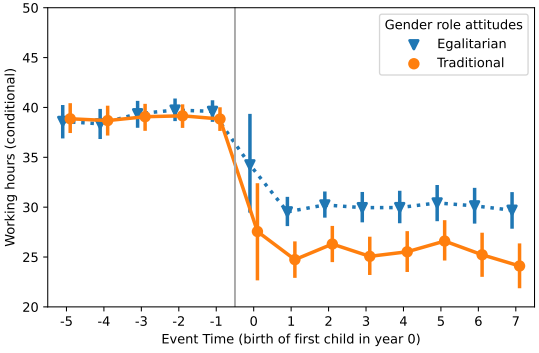


Event study difference (δ_k)

Intensive margin: working hours conditional on working



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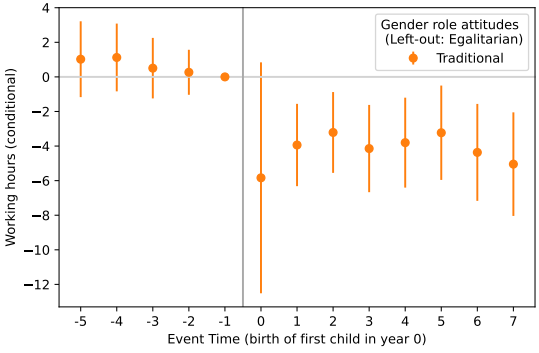

Event study difference (δ_k)

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  - Control for location, education, wages etc. (interacted with event time) ▸ Details

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- What about the fathers?
  - **Fathers' attitudes** predict maternal labor supply in addition to mothers' attitudes ▸ Details
  - **Labor supply of fathers** (almost) unaffected by having a child ▸ Details

Robustness

- Results also robust to:
  - **Alternative classifications**
    - Three groups — Details
    - Individual measures of gender attitudes — Details
  - **Different sample restrictions**
    - Balanced panel — Details
    - Only West Germany — Details
    - Only before 2020 (pre-pandemic) — Details

⇒ Gender attitudes play an important role for female labor supply

- Now: Look at interaction with policy

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- **Eligibility cutoff:** children born after Aug 1, 2012
  - Law passed in Nov 2012; during legislation process cut-off date Jan 1, 2012 planned

  $\Rightarrow$ No strategic timing of births

Empirical strategy

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- Interact event dummies and gender attitude type with **eligibility dummy** (triple-diff)

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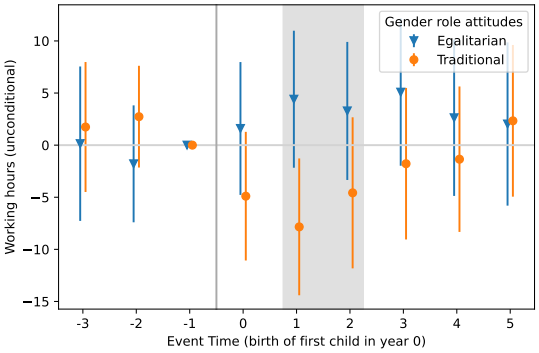
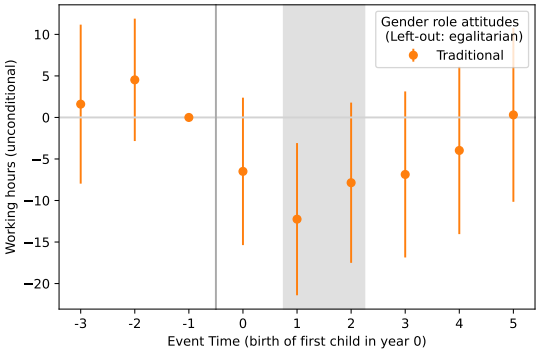
& + \phi_{age_{is}} + v_{ist}
\end{aligned}
$$

- **Parameters of interest** η_k^a: treatment effect of policy for attitude type a at event time k

The effect of cash-for-care on labor supply



Egalitarian and traditional mothers



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⇒ Gender role attitudes strongly moderate the effect of an actual policy

- Now: Look at broader set of (counterfactual) policies ⟶ structural model

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- Simulate the effect of **counterfactual policies**
- Calculate **labor supply elasticities**

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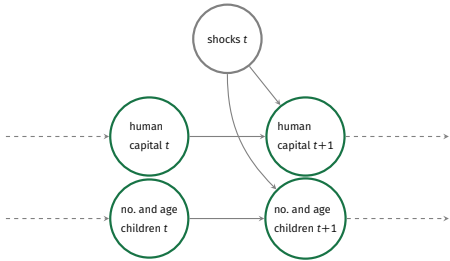
$\Rightarrow$ Set up state-of-the-art life-cycle model of female labor supply

A life-cycle model of female labor supply

- In each period, subjects take **state variables** into account



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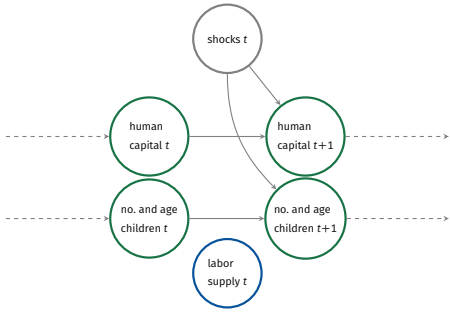

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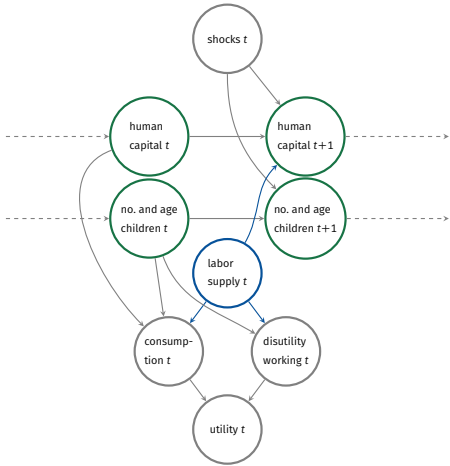
  - Human capital $t+1$ $\uparrow$



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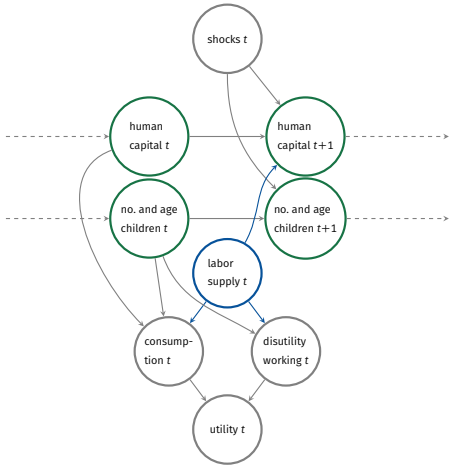
  - Human capital $t+1$ $\uparrow$
- Subjects maximize the sum of current and (discounted) future utility



Novel feature: gender role attitudes

- Gender role attitudes related to perception/prescription of **appropriate extent of maternal labor supply** (Akerlof and Kranton, 2000)
- Labor supply choice deviating from prescription leads to identity conflict $\longrightarrow$ disutility

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- In the model: two (observed) types A (egalitarian and traditional)
  - Which vary in their **disutility of working when having children**
  - ... and by fertility patterns, partner income, initial human capital

Contemporaneous utility

$$U(C_t, l_t, n_t, o_t; A) = \underbrace{\frac{\left(C_t / v(n_t)\right)^{1-\rho}}{1-\rho}}_{\text{utility from consumption}}$$

- C_t: household consumption at time t
- n_t: number of children
- $v(n_t)$: OECD equivalence scale

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▸ Full parameterization

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- C_t: household consumption at time t
- n_t: number of children
- $v(n_t)$: OECD equivalence scale
- o_t: age of the youngest child

▸ Full parameterization

Labor income, wages, human capital

$$Y_t = w_t \cdot l_t$$

Labor income, wages, human capital

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$$\log w_t = \gamma_0 + \gamma_1 \cdot K_t$$

Labor income, wages, human capital

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$$\log w_t = \gamma_0 + \gamma_1 \cdot K_t$$

$$K_{t+1} = \underbrace{(1-\delta) \cdot K_t}_{\text{depreciation}} + \underbrace{\mathbb{I}[l_t = l_{FT}] + k_{PT} \cdot \mathbb{I}[l_t = l_{PT}]}_{\text{accumulation}} + \underbrace{k_\varepsilon \cdot \varepsilon_t}_{\text{shock}}$$

Budget constraint

$$C_t = Y_t + Y_t^m(\text{age}_t; A)$$

- $Y_t^m(\text{age}_t; A)$: Income of partner (depending on age of the woman)

Budget constraint

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Budget constraint

$$C_t = Y_t + Y_t^m(\text{age}_t; A) + T_t(Y_t, Y_t^m, n_t, o_t) - CC_t(n_t, o_t, l_t)$$

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- $T_t(Y_t, Y_t^m, n_t, o_t)$: Taxes and transfers (based on the year 2018)
- $CC_t(n_t, o_t, l_t)$: Childcare costs
  - Take estimates by Geyer, Haan, and Wrohlich (2015) based on G-SOEP

Estimation of structural model

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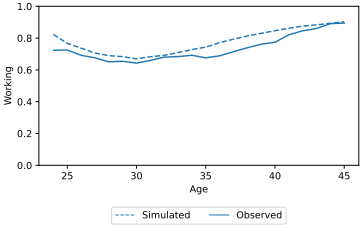
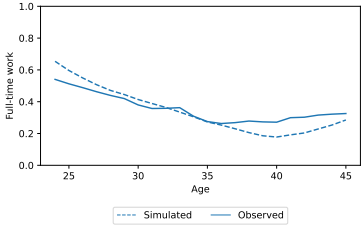
Rely on:

- GETTSIM (representation of German tax and transfer system)
- LCM (solve and simulate life-cycle models)
- estimagic and Tranquilo (estimation and optimization)

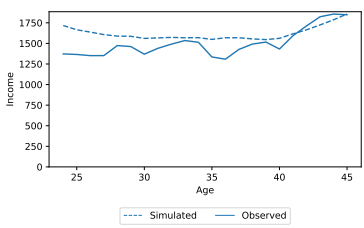
Model fit (1/3)



Share working

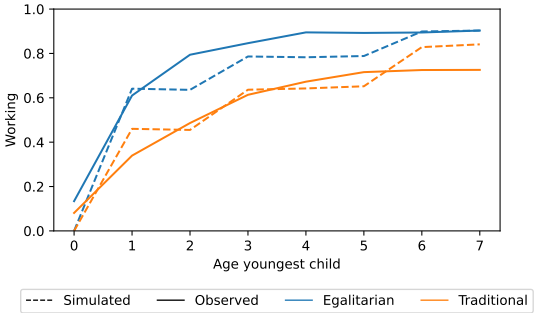


Share working full-time

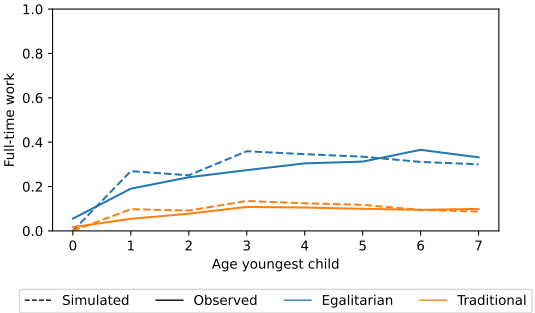


Average labor income

Model fit (2/3)



Share working by o_t



Share working full-time by o_t

Model fit (3/3)

- Other moments:
  - Share working (full-time) by number of children (by gender attitude type)
  - Year-to-year labor supply transitions

- We also hit a set of untargeted moments well (e.g. labor supply by age by attitude) ▸ Details

Labor supply elasticities higher for traditional mothers

- Marshallian labor supply elasticities for a permanent increase in wages

	Working hours (unconditional)		Labor force participation	
	Egalitarian	Traditional	Egalitarian	Traditional
Age 25	0.62	0.78	0.11	0.33
Age 30	1.33	1.66	0.77	1.01
Age 35	1.58	1.71	0.74	1.13
Age 40	1.70	1.59	0.95	1.34
Mean	1.31	1.44	0.64	0.95

Reform that improves access to full-time childcare

- Set costs of full-time childcare to costs of part-time childcare:
  - children younger than three: 381 EUR $\longrightarrow$ 219 EUR
  - children between three and five: 128 EUR $\longrightarrow$ 122 EUR

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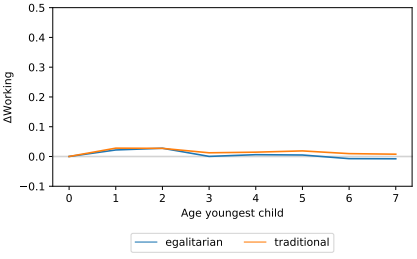
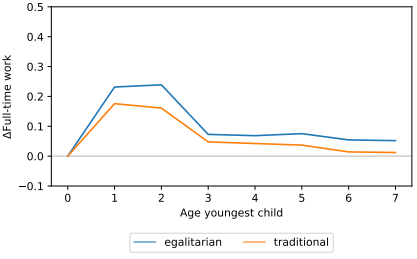


Δ share working by o_t



Δ share working full-time by o_t

- Egalitarian mothers increase labor supply more strongly
- Even at age 6 and 7, when childcare costs no longer relevant

Conclusion

- Gender role attitudes of both parents strongly related to maternal labor supply
- **Attitudes moderate effects of polices:**
  - Cash-for-care policy affected only labor supply of traditional mothers
  - Labor supply elasticities: traditional mothers are more responsive to changes in wages
  - But policy can be tailored specifically to the needs of egalitarian mothers

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- **Policy implications:**
  1. Policies can be designed to provoke reactions of specific subpopulations
  2. Average policy effects depend on distribution of gender attitudes
  3. The potential effectiveness of changes in economic incentives is limited (especially in the short-run)
     - If the policy goal is to increase maternal labor supply, understanding how policies alter attitudes is important

Thank you!

- My research: Understand decisions of individuals and households in two domains:

Labor supply decisions

- Look at the role of:
  - Institutional environment
  - Gender attitudes
  - Job characteristics (e.g. job flexibility through remote work)

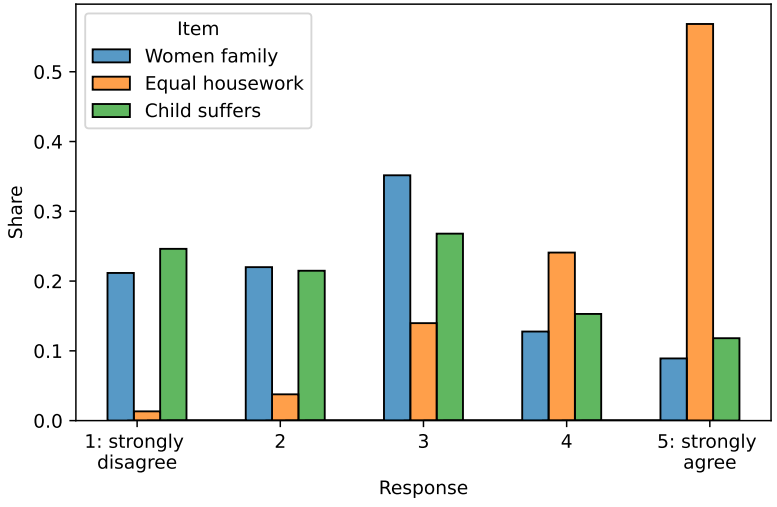
Financial decisions

- Behavioral determinants of (financial) risk-taking
- Identity concerns, negative perceptions about stockholders, ambiguity attitudes, beliefs

Outline appendix

- ▸ Data
- ▸ Institutional environment
- ▸ Event studies
- ▸ Cash-for-care
- ▸ Structural model

Pairfam: Raw responses gender role attitudes

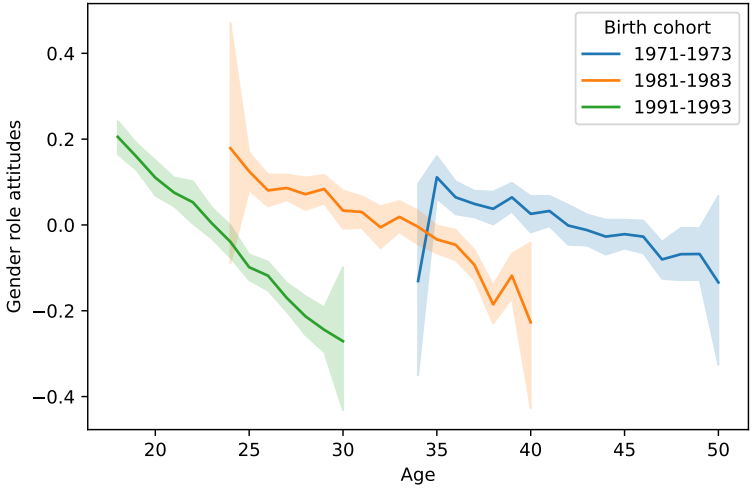


Elicited gender role attitudes

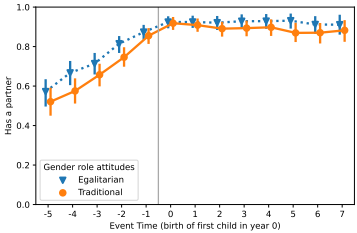
- Questions (on five-point Likert scale):
  - 'Women should be more concerned about their family than about their career.'
  - 'Men should participate in housework to the same extent as women.' (reverted scale)
  - 'Children below the age of 6 suffer if their mother works.'
- Inter-item correlation of 0.17 to 0.38
- Index highly correlated:
  - over time ($\rho = 0.63$)
  - within households ($\rho = 0.41$)

Back

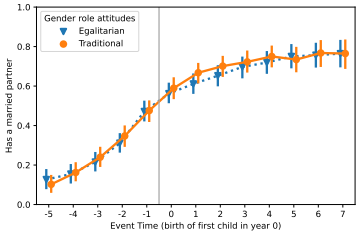
Gender role attitudes by age over cohorts



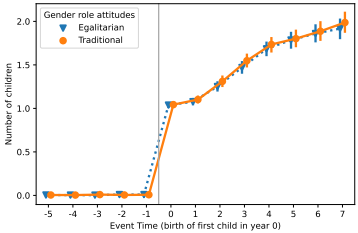
Household composition around the birth of the first child



Has a partner



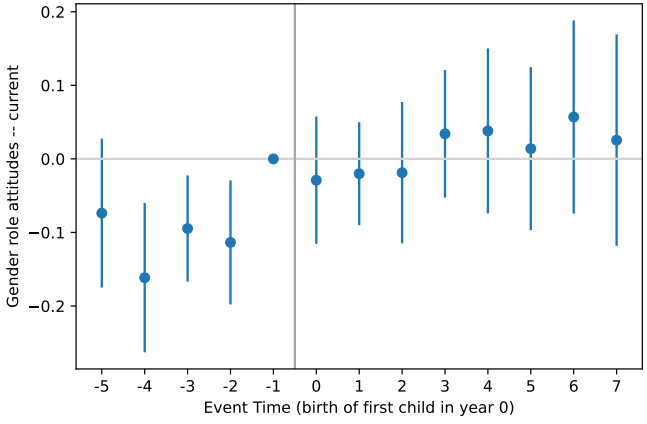
Has a married partner



Number of children

Back

Development of attitudes around childbirth



Institutional environment

- Female labor supply
  - High employment rates of women (70%, OECD avg: 69%)
  - High part-time rate (37%, OECD avg: 25%)
  - Labor supply reduction of mothers is among the strongest internationally
  - Strong Δ between East Germany (former socialist part) and West Germany

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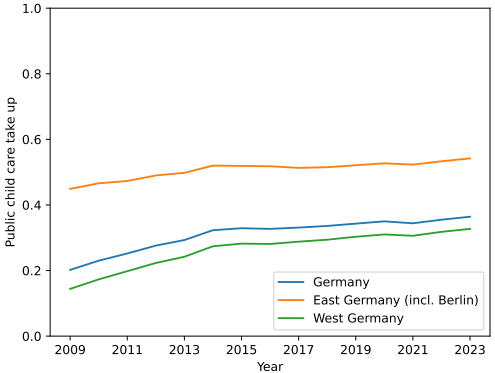
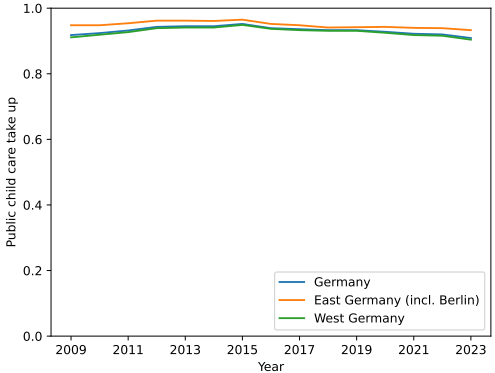
  - Strong Δ between East Germany (former socialist part) and West Germany
- Tax and transfer system
  - Comprehensive means-tested welfare system
  - Parental leave: legal right to return to the same job within three years after birth
  - Paid parental leave: Replacement rate of 67%, 14 months, 12 months max per parent
  - Monthly child benefit of 200 EUR per month
  - Tax system: progressive tax rates; income splitting for married couples
    - Tax advantage for married couples which is increasing in income gap

Public childcare take-up over time in Germany



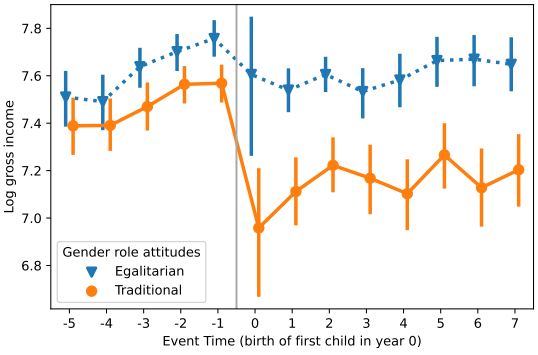
Below the age of three



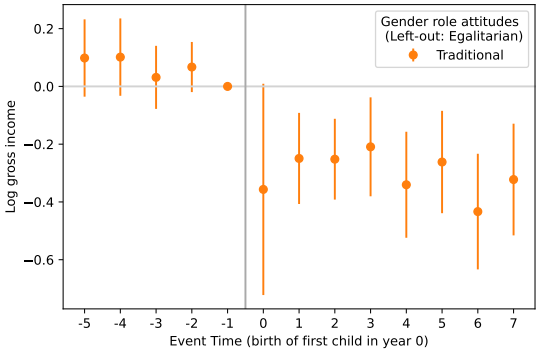
Between three and five years old

Back

Income (log)

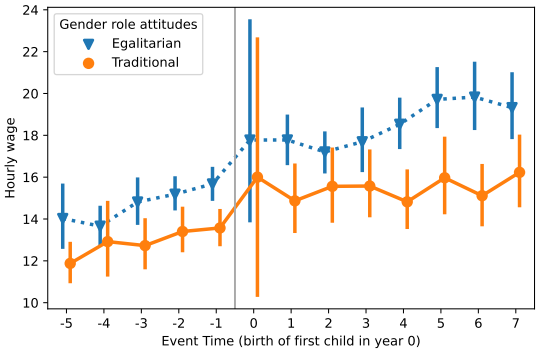


Raw means by event time

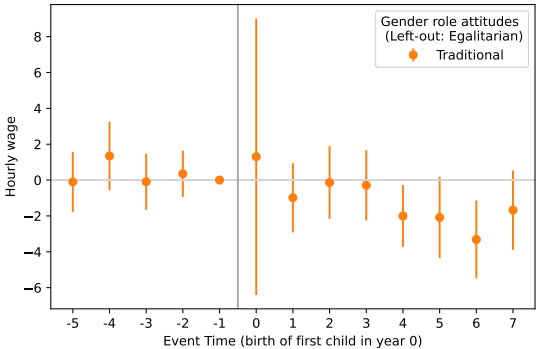


Event study difference (δ_k)

Wages



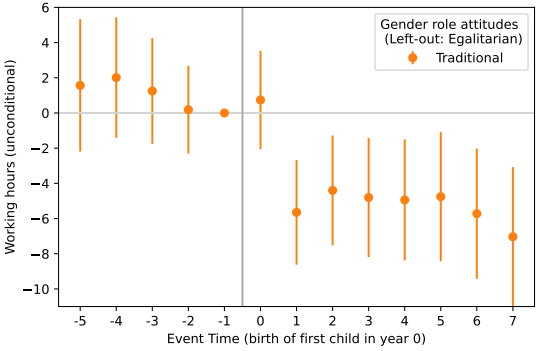
Raw means by event time



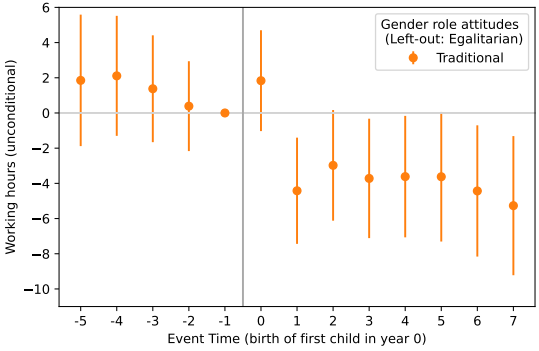
Event study difference (δ_k)

Back

Additional control variables: event study difference (δ_k)



Baseline



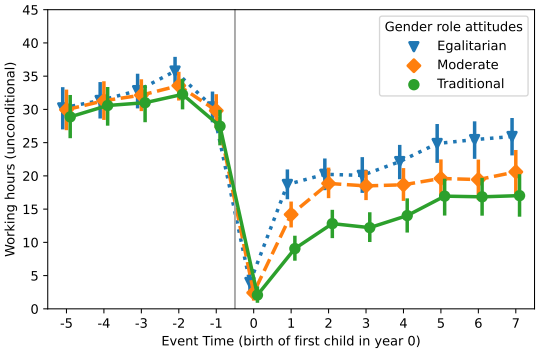
Control variables (interacted with post-birth dummy)

Additional control variables

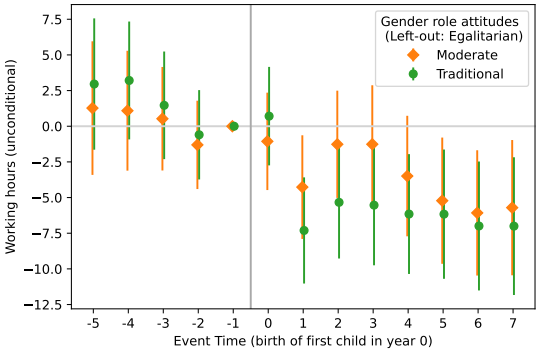
	Working hours (unconditional)				
	(1)	(2)	(3)	(4)	(5)
Traditional × Event time = 0	−0.08	−0.23	0.092	−0.12	−0.5
	(1.1)	(1.1)	(1.1)	(1.1)	(1.1)
Traditional × Event time ∈ [1, 2]	−5.7***	−5.6***	−4.1***	−3.9***	−3.8***
	(1.1)	(1.1)	(1.1)	(1.1)	(1.1)
Traditional × Event time ≥ 3	−6.1***	−6.1***	−4.5***	−4.2***	−4.2***
	(1.3)	(1.3)	(1.3)	(1.3)	(1.3)
Year FE	Yes	Yes	Yes	Yes	Yes
Age FE	Yes	Yes	Yes	Yes	Yes
Has a partner before birth × Event time	No	Yes	Yes	Yes	Yes
Has a married partner before birth × Event time	No	Yes	Yes	Yes	Yes
Municipality ≥ 100k inhabitants × Event time	No	No	Yes	Yes	Yes
State × Event time	No	No	Yes	Yes	Yes
Any migration background × Event time	No	No	No	Yes	Yes
Religious affiliation × Event time	No	No	No	Yes	Yes
Education: tertiary × Event time	No	No	No	No	Yes
Wage before birth high × Event time	No	No	No	No	Yes
Observations	7623	7623	7623	7623	7623
Adj. R^2	0.3	0.31	0.32	0.32	0.33

Back

3 groups



Raw means by event time

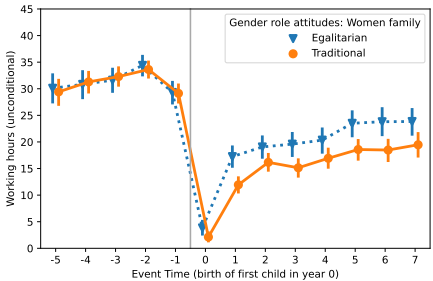


Event study difference (δ_k)

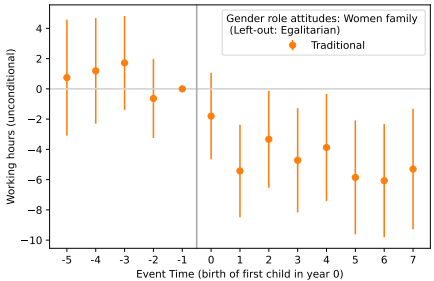
Back

Individual measure: women more concerned family

- ‘Women should be more concerned about their family than about their career.’



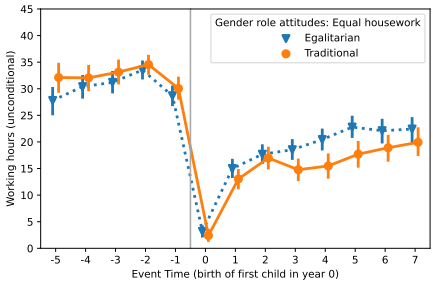
Raw means by event time



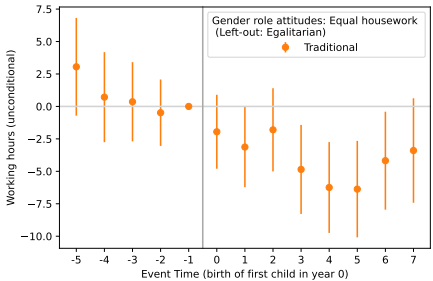
Event study difference (δ_k)

Individual measure: Equal housework

- ‘Men should participate in housework to the same extent as women.’ (reverted scale)



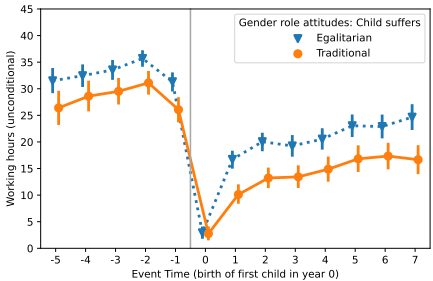
Raw means by event time



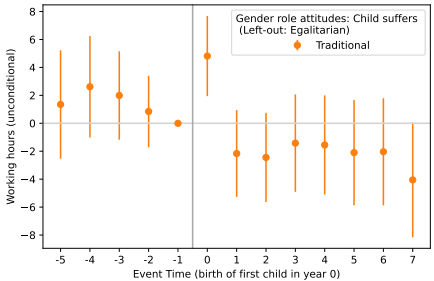
Event study difference (δ_k)

Individual measure: Child suffers if mother works

- ‘A child under 6 will suffer if their mother works.’



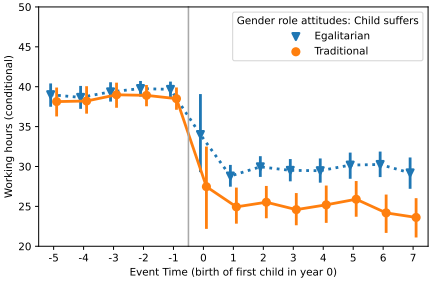
Raw means by event time



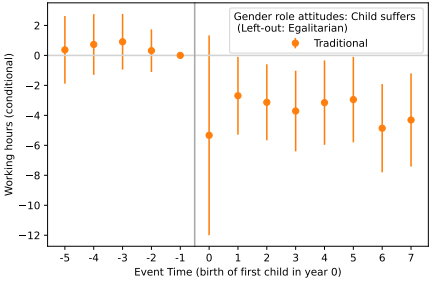
Event study difference (δ_k)

Individual measure: Child suffers if mother works (intensive margin)

- ‘A child under 6 will suffer if their mother works.’



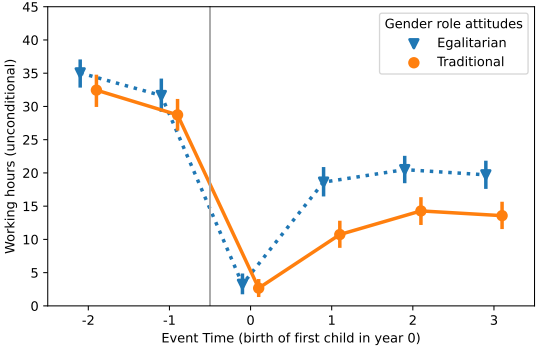
Raw means by event time



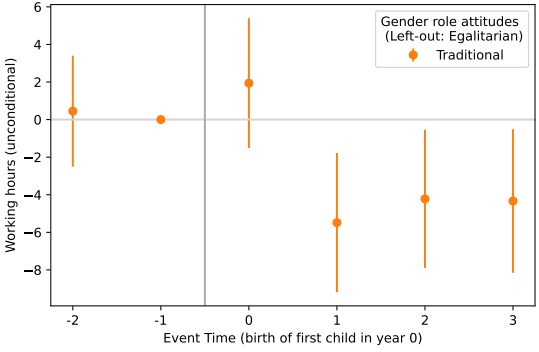
Event study difference (δ_k)

Back

Balanced panel: working hours (unconditional)

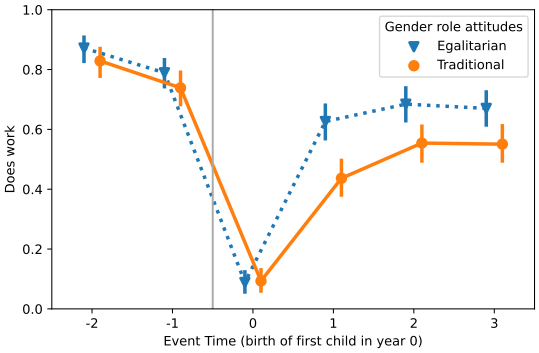


Raw means by event time

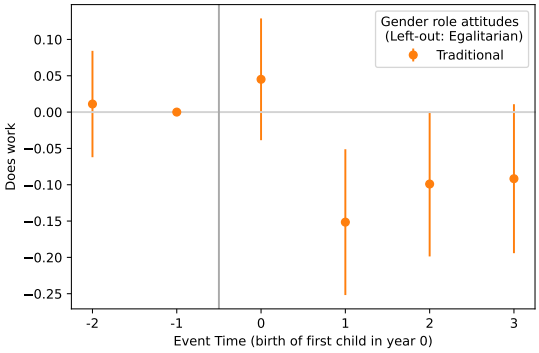


Event study difference (δ_k)

Balanced panel: extensive margin

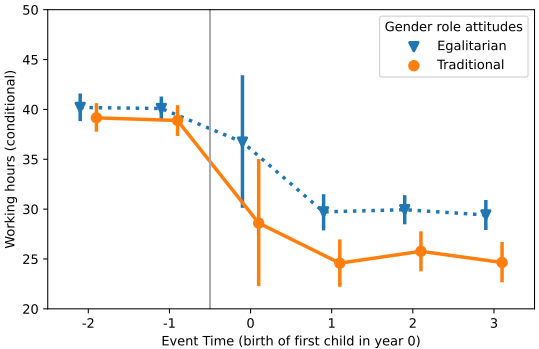


Raw means by event time

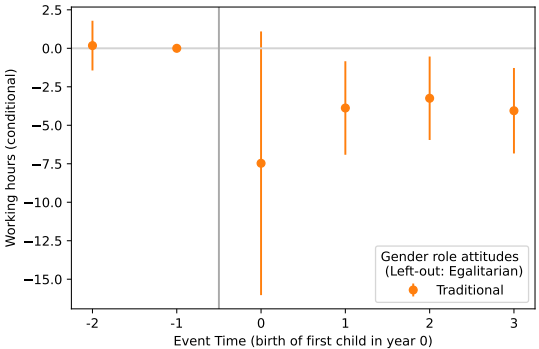


Event study difference (δ_k)

Balanced panel: intensive margin



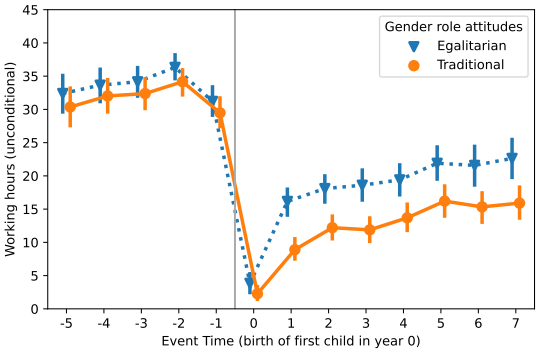
Raw means by event time



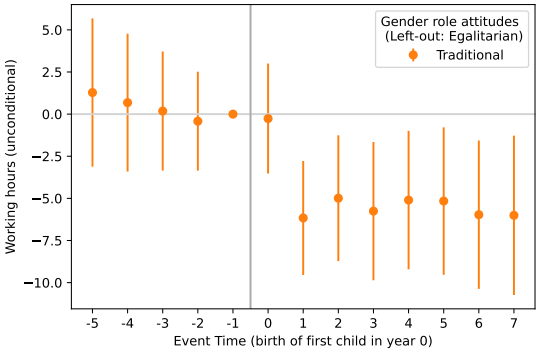
Event study difference (δ_k)

Back

West Germany only: working hours (unconditional)



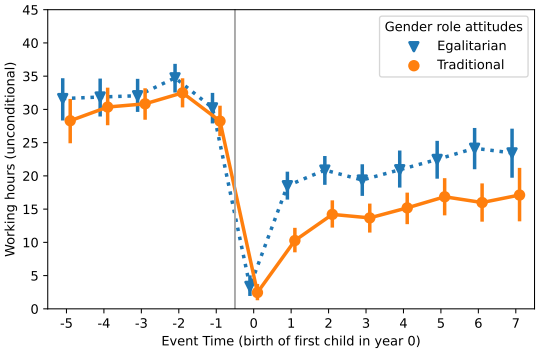
Raw means by event time



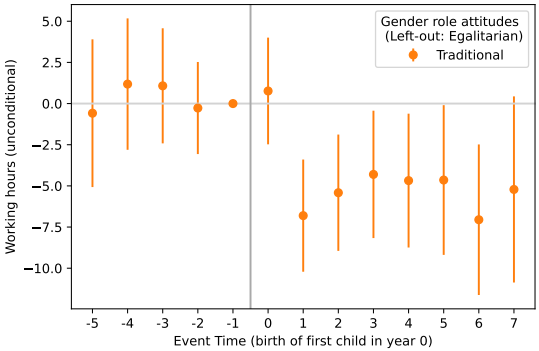
Event study difference (δ_k)

Back

Pre-pandemic: working hours (unconditional)



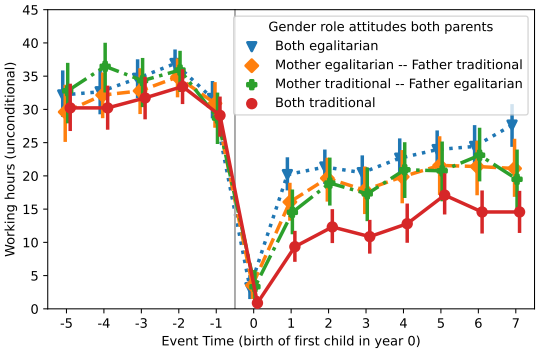
Raw means by event time



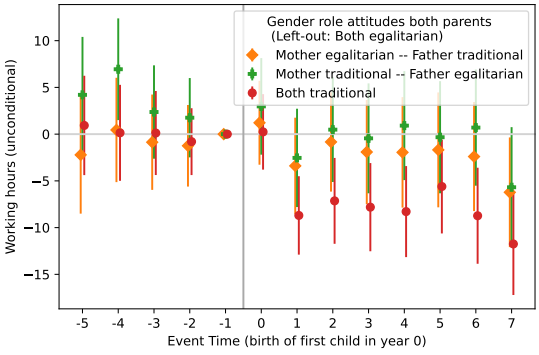
Event study difference (δ_k)

Back

Maternal labor supply by attitudes of both parents



Raw means by event time



Event study difference (δ_k)

Back

Maternal labor supply by attitudes of mother and father

	Working hours (unconditional)		
	(1)	(2)	(3)
Attitudes mother (traditional)	−0.45		−0.23
	(0.51)		(0.55)
Attitudes mother (traditional) × Event time = 0	−0.35		−0.53
	(0.61)		(0.66)
Attitudes mother (traditional) × Event time ∈ [1, 2]	−3.1***		−2.5***
	(0.63)		(0.71)
Attitudes mother (traditional) × Event time ≥ 3	−2.9***		−2.1***
	(0.68)		(0.77)
Attitudes father (traditional)		−0.7	−0.61
		(0.51)	(0.55)
Attitudes father (traditional) × Event time = 0		0.25	0.47
		(0.64)	(0.7)
Attitudes father (traditional) × Event time ∈ [1, 2]		−2.4***	−1.3**
		(0.61)	(0.67)
Attitudes father (traditional) × Event time ≥ 3		−2.5***	−1.6**
		(0.68)	(0.75)
Year FE	Yes	Yes	Yes
Age FE	Yes	Yes	Yes
Observations	5865	5865	5865
Adj. R^2	0.31	0.31	0.32

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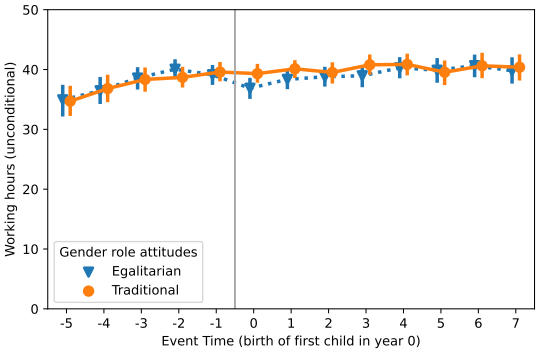
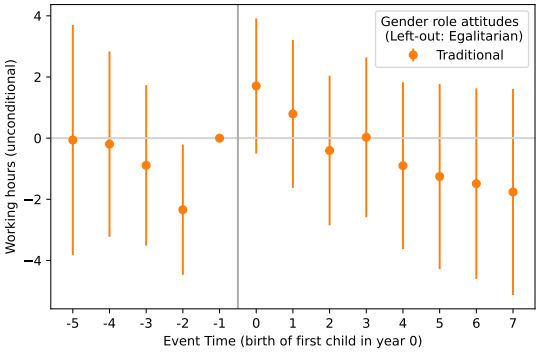
Paternal unconditional working hours by parental attitudes



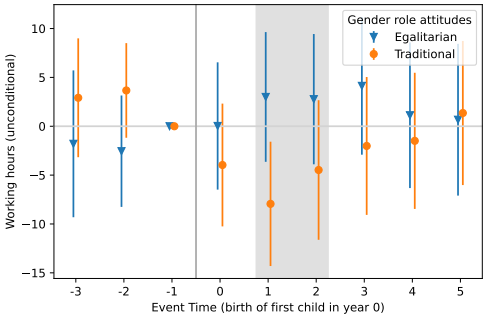
Raw means by event time



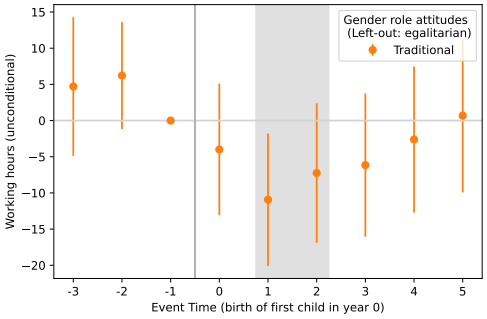
Event study difference (δ_k)

Back

Additional controls (interacted with post-birth dummy): the effect of cash-for-care on labor supply



Egalitarian and traditional mothers



Δ egalitarian and traditional mothers

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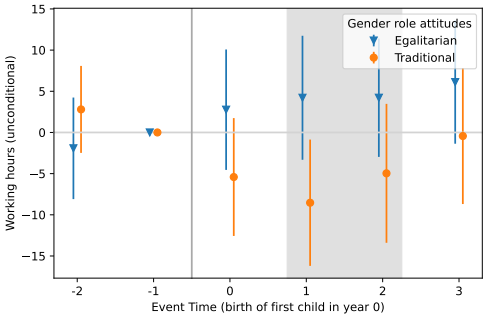
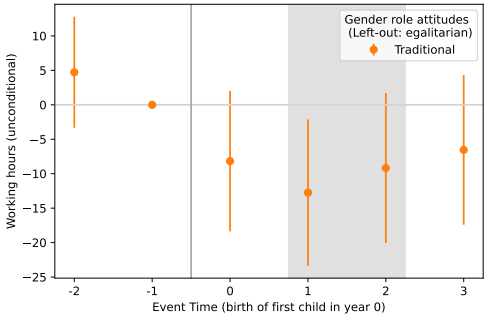
Balanced panel: the effect of cash-for-care on labor supply



Egalitarian and traditional mothers



Δ egalitarian and traditional mothers

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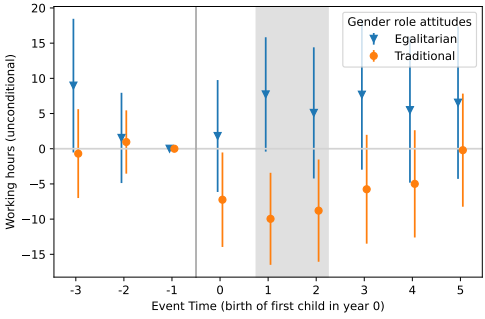
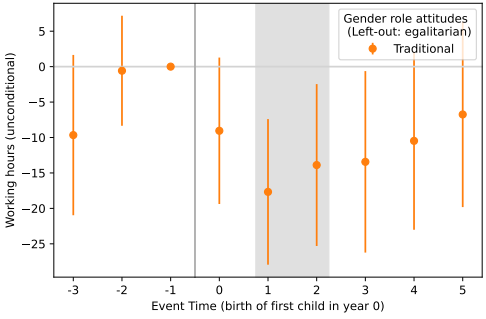
West Germany only: the effect of cash-for-care on labor supply



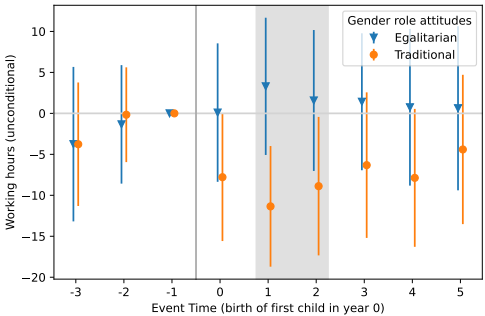
Egalitarian and traditional mothers



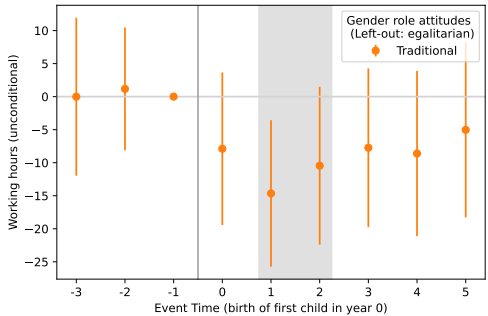
Δ egalitarian and traditional mothers

Back

Exclude states with cash-for-care: the effect of cash-for-care on labor supply



Egalitarian and traditional mothers



Δ egalitarian and traditional mothers

Back

Disutility of working (with children)

$$f(l_t) = \begin{cases} \mu_{PT}, & \text{if } l_t = l_{PT} \\ \mu_{FT}, & \text{if } l_t = l_{FT} \\ 0, & \text{else} \end{cases}$$

$$q(l_t, o_t; A) = \begin{cases} \mu_{PT}\left(\alpha^A_{PT,child} + \alpha^A_{age} \max\{6 - o_t, 0\}\right), & \text{if } l_t = l_{PT} \\ \mu_{FT}\left(\alpha^A_{FT,child} + \alpha^A_{age} \max\{6 - o_t, 0\}\right), & \text{if } l_t = l_{FT} \\ 0, & \text{else} \end{cases}$$

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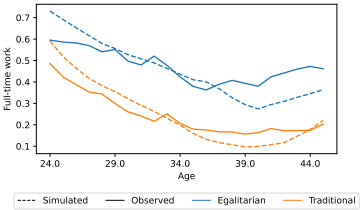
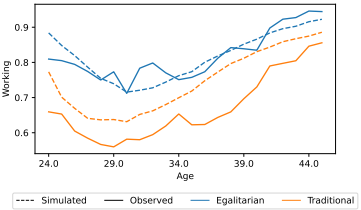
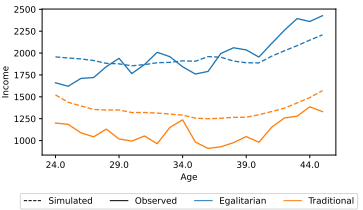
Untargeted moments



Share working



Share working full-time



Average labor income

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