Marriage and Divorce under Labor Market Uncertainty

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Idea

- Choices in labor and marriage markets interact.

  1. Being married, and to whom, affects labor market outcomes.
     - household specialization, gender identity (e.g., Betrand et al., 2015)
     - marital wage premia, joint search (e.g., Pilossoph & Wee, 2021).
  2. Labor market outcomes affect who marries and who divorces.
     - employed men are more desirable partners (e.g., Autor et al., 2019)
     - labor market transitions may cause divorce (e.g., Folcke & Rickne, 2020)
     - marital sorting based on wages, employment (e.g., Goussé et al., 2017).

- Existing (structural) work largely abstracts from this interaction. Literature
- We study the interaction in a novel structural model and take it to the data.

Contribution

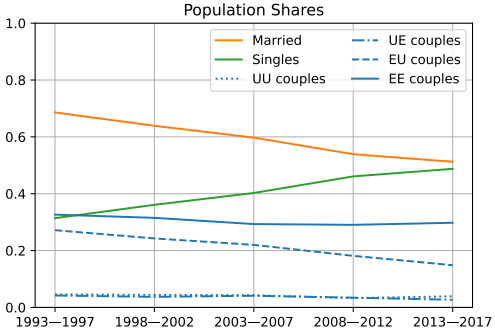
- Model of simultaneous search and matching in marriage and labor markets.
- Why do individuals get married? → *Marital surplus*
  - A match-specific "love" shock.
  - Public good, depends on time inputs and preferences.
- Why do couples break up? → *Change of marital surplus*
  - Love shock gets updated.
    → May lead to *love shock divorce*
  - Public good changes in response to labor market transitions (both EU and UE).
    → May lead to *labor market transition divorce*
- Aggregate developments in the labor market can have feedback effects on marriage.
- We confront the model with German data (GSOEP, 1993–2017).

Outline

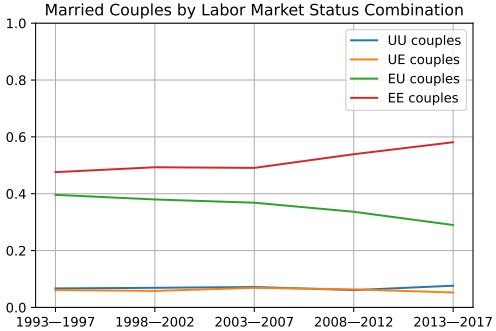
1. Empirical Facts
2. Model
3. Estimation
4. Application

Empirical Facts

Population Shares and Couple Types over Time



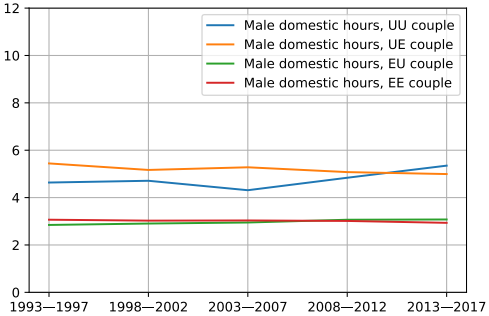
(a) Population Shares



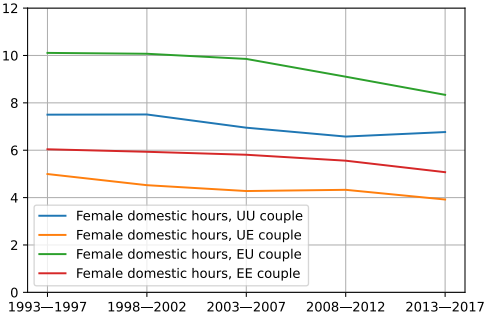
(b) Married Coupes by Labor Market Status

Cohabitation | Employment Rates over Time | Event Study Analysis

Domestic Work Hours over Time



(c) Married Males



(d) Married females

Note: Domestic work hours include childcare, errands, repairs, routine chores. Time Inputs

Model

Utility and Marital Surplus

- We assume quasi-linear preferences in consumption c_f, leisure e_f, and a household public good y.

$$u(c_f, e_f, y) = c_f + \zeta_x e_f + y$$

$$\text{with } y = \begin{cases} \left(X_j^l\right)^{1-\alpha_x} (h_f)^{\alpha_x} & \text{if single female} \\ \left(zX_{ij}^{-ll}\right)^{(1-\gamma_y-\gamma_x)} (h_m)^{\gamma_y} (h_f)^{\gamma_x} & \text{if married.} \end{cases} \quad (1)$$

$$c_f = I_j^l + t \text{ and } c_m = I_i^{-l} - t$$

$$h_f = \overline{h} - \overline{l}_j^l - e_f \text{ and } h_m = \overline{h} - \overline{l}_i^l - e_m$$

- Linearity in consumption implies that income changes affects the couples' joint utility in the same way as single utilities. $\Rightarrow$ Surplus is independent of spouses' income.

Marital Surplus | The Value of Singlehood | The Value of Marriage | Bargaining

Decisions

- Given the love shock, households maximize the surplus by setting optimal home hours and search intensities.
  - Define endogenous love-shock thresholds $S_{ij}^{-ll}\left(z_{ij}^{-ll}\right) = 0$
  - Define marriage probability $\alpha_{ij}^{-ll} = \left(1 - G\left(z_{ij}^{-ll}\right)\right)$
- If the maximized surplus is positive, couples bargain over transfers.
- Couples reoptimize when a match-specific shock hits or in case of EU/UE-transitions.
- No commitment, efficient divorce in case of negative surplus.

Flow Equation System

Equate inflows and outflows:

$$\lambda \alpha_{ij}^{-ll} s_i^{-l} s_j^{l} + \bar{\tau}_{i,j}^{-l',l} m_{ij}^{-l'l} + \bar{\tau}_{j,i}^{l',-l} m_{ij}^{-ll'} = \left[\delta \left(1 - \alpha_{ij}^{-ll} \right) + \underline{\tau}_{i,j}^{-l,l} + \bar{\tau}_{i,j}^{-l,l} + \underline{\tau}_{j,i}^{l,-l} + \bar{\tau}_{j,i}^{l,-l} \right] m_{ij}^{-ll}$$

The outflow consists of divorces driven by love shocks, $\delta \left(1 - \alpha_{ij}^{-ll} \right)$ and labor market transitions that lead to a divorce, $\underline{\tau}_{i,j}^{-l,l} + \underline{\tau}_{j,i}^{l,-l}$, where

$$\underline{\tau}_{j,i}^{u,-l} = \begin{cases} 0 & \text{if } z_{ij}^{-le} \leq z_{ij}^{-lu} \\ \mu_j \int_{z_{ij}^{-lu}}^{z_{ij}^{-le}} \sigma_{j,i}^{u,-l} \left(R_{j,i}^{u,-l} \left(z' \right) \right) \left[1 - F_j \left(R_{j,i}^{u,-l} \left(z' \right) \right) \right] dG \left(z' \right) & \text{if } z_{ij}^{-le} > z_{ij}^{-lu} \end{cases}$$

Reservation Wages

- Employed female: reservation wage is equal to the current wage irrespective of marital status, i.e., $R_j^{l,-l}\left(z, I_i^{-l}, w_j\right) = R\left(w_j\right) = w_j$.

- Unemployed single female: reservation wage depends on transfers, home production, marriage and market option value (definition $V_j^e\left(R_j^u\right) = V_j^u\left(b_j\right)$).

- Unemployed married female: reservation wage depends on partner of type i with emp. status $-l$.

$$R_{j,i}^{u,-l}(z) = R_j^u + r\left(S_{ij}^{-lu}(z) - \max\left[0, S_{ij}^{-le}(z)\right]\right)$$

Estimation

Structural Estimation

- Multiple versions: employment status heterogeneity (today),
  + heterogeneous education, age, number of children (one or two-dim. het.).
- We target the following groups of moments:
  1. Transition probabilities: marriage/singlehood, employment/unemployment Moments I
  2. Domestic work hours of singles and couples conditional on employment Moments II
  3. Wage-earnings distribution for males and females Moments III
- We have analytical expressions for all theoretical moments $\rightarrow$ GMM identification
- We estimate 22 model parameters Estimated parameter values
- The estimated model fits the empirical patterns very well Fit MM Fit LM Women Fit LM Men

Application

What are the marriage market implications of the “German labor market miracle”?

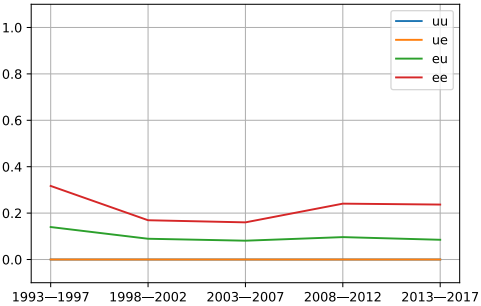
Application: The German labor market miracle

- Unemployment rate fell from more than 11% (2005) to below 4% (2017). Click
  - Comprehensive labor market reforms from 2003–2005 (Hartz reforms).
  - Female employment relatively more affected (Burda & Seele, 2020).
  - Favorable business cycle conditions during the 2000s, wage moderation.
  - Very resilient labor market in the “Great Recession”, furlough schemes.
  - Public child care reforms (2005–2008), parental leave reform (2007).

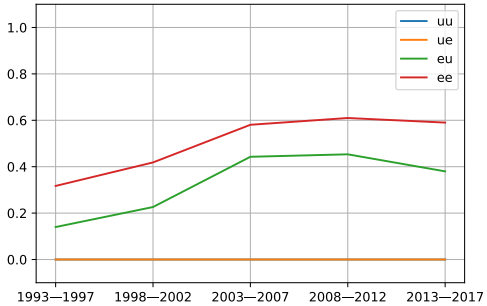
- What is the effect on the marriage market? More divorces?
- Our approach to answer this question:
  - Re-estimate labor market parameters for 5-year time windows. Click
  - Hold them fixed at the 1993–1997 level.
  - Compare model-implied counterfactual and actual developments.

Labor Market Transition Divorce, Male Transition

- $\underline{\tau}_{i,j}^{-l,l}$ divided by total divorces for couple type over time:



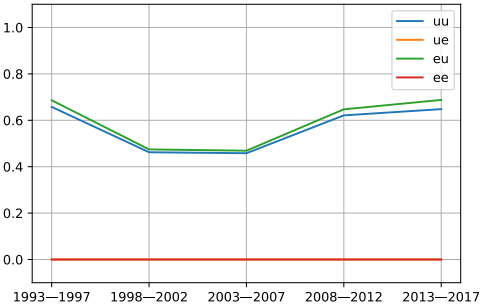
(e) Labor Market Divorce Share Men



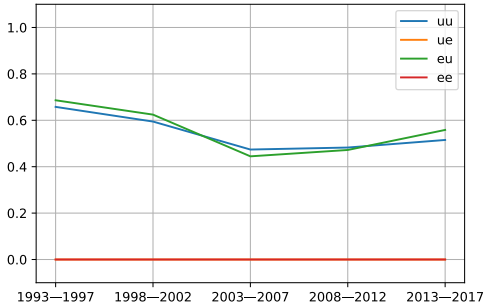
(f) Counterfactual (key parameters fixed 93–97)

Labor Market Transition Divorce, Female Transition

- $\underline{\tau}_{j,i}^{l,-l}$ divided by total divorces for couple type over time:



(g) Labor Market Divorce Share Women



(h) Counterfactual (key parameters fixed 93–97)

Conclusions

- We present a novel structural model that highlights the interaction between decisions made in labor and marriage markets.
- In this paper, we apply the model to the "German labor market miracle" and find significant feedback on the marriage market $\rightarrow$ more divorces, both directly (labor market transition divorces) and indirectly (potentially more low-surplus couples).
- In ongoing work, we study the effects of the interaction on marital sorting and income inequality (full heterogeneity).

Thank you for your attention.

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Literature

- Unemployment, especially male unemployment, is associated with an increase in the divorce rate (e.g. Jensen and Smith, 1990; Hansen, 2005; Amato and Beattie, 2011).
- Marriage/divorce rates negatively correlated with unemployment over the business cycle (e.g. Schaller, 2013; González-Val and Marcén, 2017a/b).
- Does female labor market participation decrease or increase marital stability? (Newman and Olivetti, 2018 vs. Folke and Rickne, 2020).
- Marriage market matching models (with and without frictions, TU/NTU): Becker (1973/74), Burdett & Coles (1997), Shimer & Smith (2000), Jacquemet & Robin (2012), Choo & Siow (2006), Choo (2015), Chiappori et al. (2015).
- Models of joint search: Guler et al. (2012), Pilossoph & Wee (2021), Fang & Shephard (2019).
- Most closely related: Goussé et al. (2017), Greenwood et al. (2016).

Go back

Household specialization - Time Inputs

- Labor market work hours per day

	single		married			
	U	E	UU	UE	EU	EE
male	0.57	9.68	0.25	0.66	10.23	10.32
female	0.67	8.50	0.21	8.02	0.67	7.64

- Domestic work hours per day (childcare, errands, repairs, routine chores):

	single		married			
	U	E	UU	UE	EU	EE
male	3.21	2.62	4.99	5.42	3.08	3.13
female	6.00	3.97	7.39	4.57	9.89	5.90

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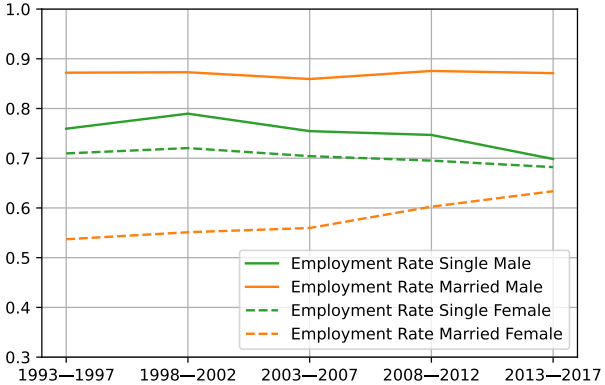
Employment Rates over Time



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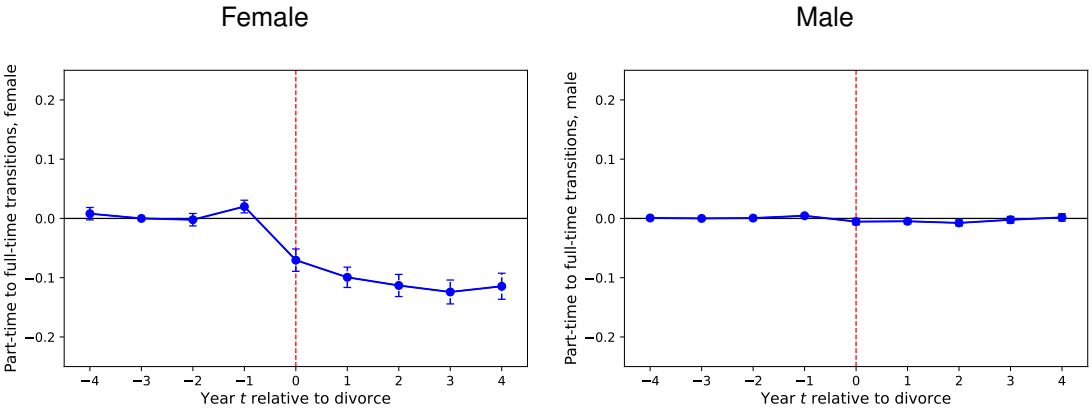
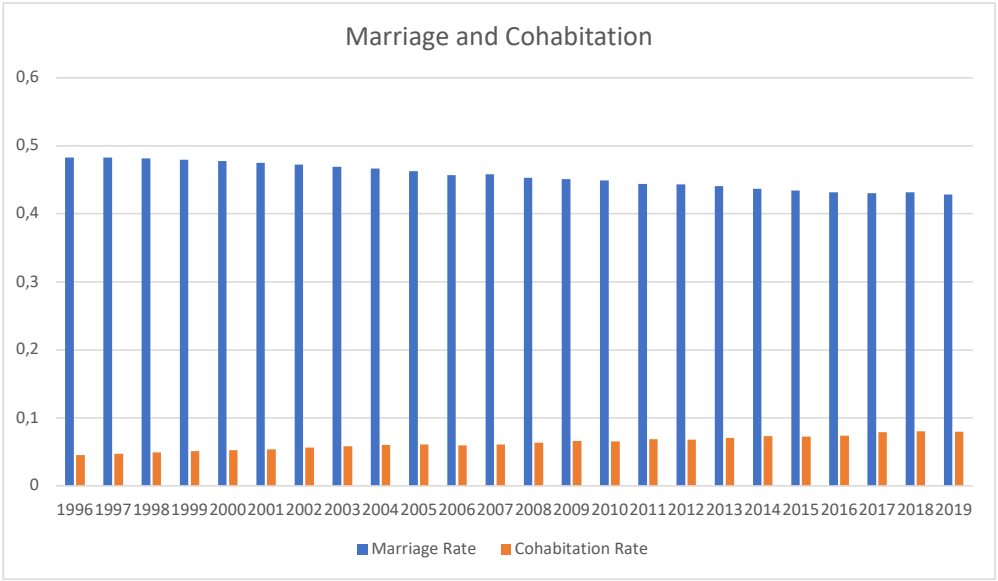
Event Study: Part-time to full-time transitions around Divorce

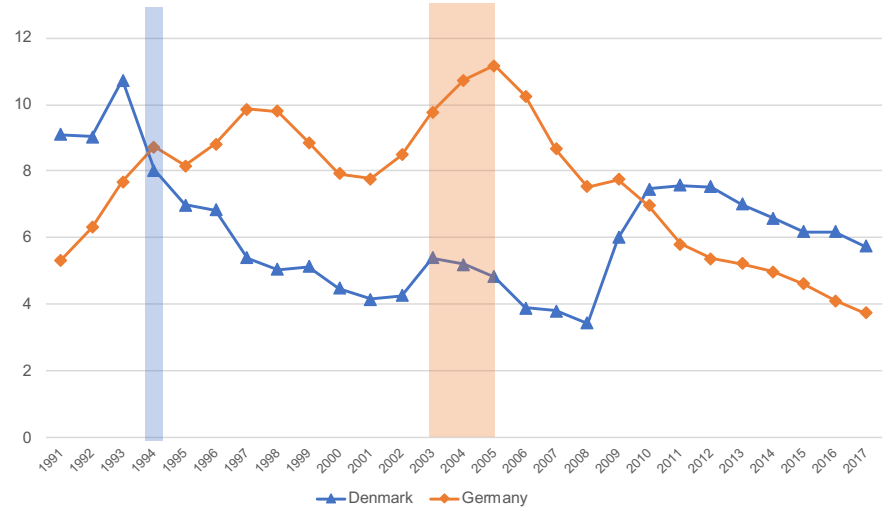


- Relative to matched control group: no divorce, matched in $t-3$.


Marriage and Cohabitation
0,6
0,5
0,4
0,3
0,2
0,1
0
1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Marriage Rate
Cohabitation Rate

Go back

Unemployment Rate and Major Labor Market Reforms



Go back

Bargaining - No Commitment

- Bargaining powers are (β_i, β_j), with $\beta_i + \beta_j = 1$.
- Transfers are chosen such that the Nash-Product,

$$\left[V_j^{l,-l}\left(z, I_i^{-l}, I_j^l\right) - V_j^l\left(I_j^l\right)\right]^{\beta_j}\left[V_i^{-l,l}\left(z, I_i^{-l}, I_j^l\right) - V_i^{-l}\left(I_i^{-l}\right)\right]^{\beta_i},$$

  is maximized subject to participation and feasibility constraints.

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The Value of Singlehood

- The present value of being a single female with $l \in \{e, u\}$ satisfies:

$$rV_j^l\left(I_j^l\right) = \underbrace{u_j^l\left(I_j^l\right)}_{\text{Flow utility}} + \underbrace{q_j\left[V_j^u\left(b_j\right) - V_j^l\left(I_j^l\right)\right]\mathbb{1}\left[l=e\right]}_{\text{Job separation if employed}}$$

$$+ \underbrace{\max_{\sigma_j}\left[\sigma_j\mu_j\int\max\left[V_j^e\left(w_j'\right) - V_j^l\left(I_j^l\right), 0\right]dF_j\left(w_j'\right) - c\left(\sigma_j\right)\right]}_{\text{Search intensity choice}}$$

$$+ \underbrace{\lambda_{ij}\iiint\max\left[V_j^{l,-l}\left(z', I_i^{-l}, I_j^l\right) - V_j^l\left(I_j^l\right), 0\right]dG\left(z'\right)s_i d\widehat{H}_i^s\left(I_i\right)di}_{\text{Option value of finding a (male) partner}}$$

- $\widehat{H}_i^s\left(I_i\right)$ is the income distribution for singles of type i, incorporating the wage earnings distribution $H_i^s\left(w_i\right)$ and the unemployment rate u_i^s.

Go back

The Value of Marriage

$$
\begin{aligned}
& rV_j^{l,-l}\left(z, I_i^{-l}, I_j^{l}\right) = u_j^{l,-l}\left(z, I_i^{-l}, I_j^{l}\right) \\
+ \;& \delta \int \left[\max\left[V_j^{l}\left(I_j^{l}\right), V_j^{l,-l}\left(z', I_i^{-l}, I_j^{l}\right)\right] - V_j^{l,-l}\left(z, I_i^{-l}, I_j^{l}\right)\right] dG\left(z'\right) \\
+ \;& \widehat{\sigma}_{j,i}^{l,-l}\mu_j \int_{R_j^{l,-l}(z, I_i^{-l}, I_j^{l})} \left[\max\left[V_j^{e}\left(w_j'\right), V_j^{e,-l}\left(z, I_i^{-l}, w_j'\right)\right]\right. \\
- \;& \left. V_j^{l,-l}\left(z, I_i^{-l}, I_j^{l}\right)\right] dF_j\left(w_j'\right) - c\left(\widehat{\sigma}_{j,i}^{l,-l}\right) \\
+ \;& \widehat{\sigma}_{i,j}^{-l,l}\mu_i \int_{R_i^{-l,l}(z, I_i^{-l}, I_j^{l})} \left[\max\left[V_j^{l}\left(I_j^{l}\right), V_j^{l,e}\left(z, w_i', I_j^{l}\right)\right] - V_j^{l,-l}\left(z, I_i^{-l}, I_j^{l}\right)\right] dF_i\left(w_i'\right) \\
+ \;& q_j\left[\max\left[V_j^{u}\left(b_j\right), V_j^{u,-l}\left(z, I_i^{-l}, b_j\right)\right] - V_j^{l,-l}\left(z, I_i^{-l}, I_j^{l}\right)\right] \mathbb{1}\left[l = e\right] \\
+ \;& q_i\left[\max\left[V_j^{l}\left(I_j^{l}\right), V_j^{l,u}\left(z, b_i, I_j^{l}\right)\right] - V_j^{l,-l}\left(z, I_i^{-l}, I_j^{l}\right)\right] \mathbb{1}\left[-l = e\right]
\end{aligned}
$$

Go back

The Surplus of Marriage

- independent of income due to quasi-linearity of utility, strictly increasing in z. Go back

$$
\begin{aligned}
\left[r+\delta+q_i+q_j\right] S_{ij}^{-ll}(z) &= v_{ij}^{-ll}(z) + \delta \int_{z_{ij}^{-ll}}^{\infty} S_{ij}^{-ll}\left(z'\right) dG\left(z'\right) \\
\textit{Gains from search for } i \Leftarrow &+ \frac{c'(\widehat{\sigma}_{i,j}^{-l,l})^{1+\kappa}}{1+\kappa} - \frac{c'(\widehat{\sigma}_{i}^{-l})^{1+\kappa}}{1+\kappa} \\
\textit{Gains from search for } j \Leftarrow &+ \frac{c'(\widehat{\sigma}_{j,i}^{l,-l})^{1+\kappa}}{1+\kappa} - \frac{c'(\widehat{\sigma}_{j}^{l})^{1+\kappa}}{1+\kappa} \\
&+ q_i \max\left[0, S_{ij}^{ul}(z)\right] + q_j \max\left[0, S_{ij}^{-lu}(z)\right] \\
&- \lambda_{ij}\beta_i \int_j \sum_{l\in\{u,e\}} s_j^l \int_{z_{ij}^{-ll}}^{\infty} S_{ij}^{-ll}\left(z'\right) dG\left(z'\right) dj \\
&- \lambda_{ij}\beta_j \int_i \sum_{-l\in\{u,e\}} s_i^{-l} \int_{z_{ij}^{-ll}}^{\infty} S_{ij}^{-ll}\left(z'\right) dG\left(z'\right) di
\end{aligned}
$$

Solution Method

- Linear grids with, 1×1, 4×4, 5×5, 20×20 nodes.
- Three fixed point systems, alternating solution algorithm.
  1. Initialize the model.
  2. Find fixed point of first system of equations:
     - 16 integrated surplus equations.
  3. Find fixed point of second system of equations:
     - Compute reservation wages and search intensities.
     - Find the z_{ij}^{ll} thresholds at the point where the surplus is zero.
  4. z_{ij}^{ll} determine $\alpha_{ij}^{ll} \equiv \left(1 - G\left(z_{ij}^{ll}\right)\right)$, which determine m_{ij}^{ll}.
  5. Use flow equations and exog. distributions of i, j to find s_i^l, s_j^l.
  6. Go back to step 2. Repeat until convergence.

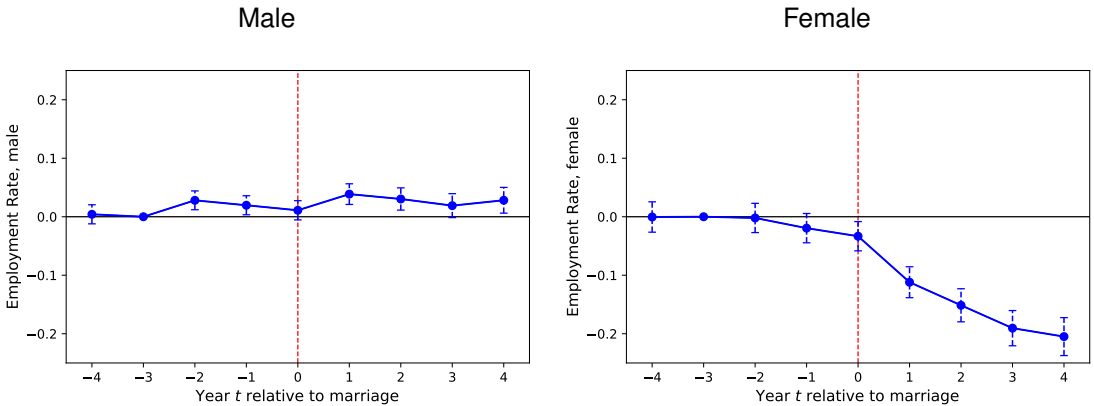
Go back

Event Study Analysis

- Show evolution of outcome Y around event E
- Relative to control group (no event), matched in $t-3$.
- $Y = \{EmploymentRate, WorkHours, DomesticHours, LifeSatisfaction\}$
- $E = \{Marriage, Divorce\}$
- Around marriage, employment rate and work hours increase for men (with anticipation) and decrease for women. Employment rate Work Hours
- Around divorce,
  - employment rate decreases for men (with anticipation), and increases for women. Click
  - work hours increase significantly in advance of a divorce for women. Click
  - domestic hours increase significantly in advance of a divorce for men. Click
  - life satisfaction decreases in advance, slow recovery. Click

Go back

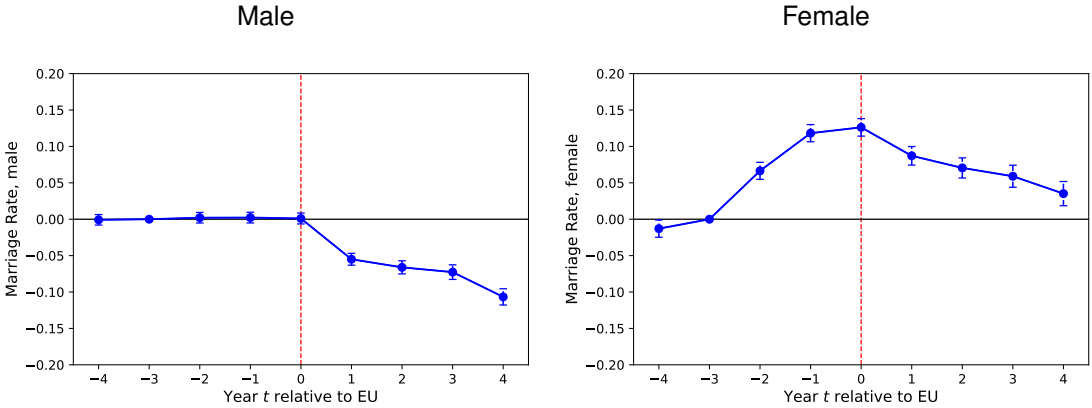
Event Study: Employment Rate around Marriage



- Relative to matched control group: no marriage, matched in $t-3$.

Go back

Event Study: Marriage Rate around EU Transition

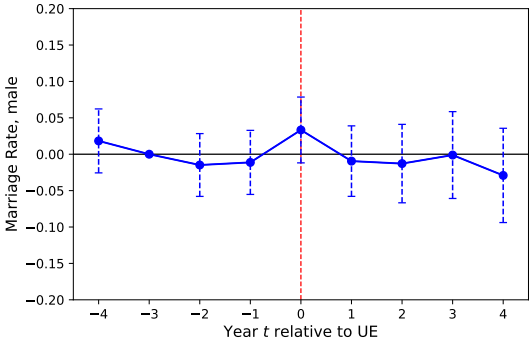


- Relative to matched control group: no EU Transition, matched in $t-3$.

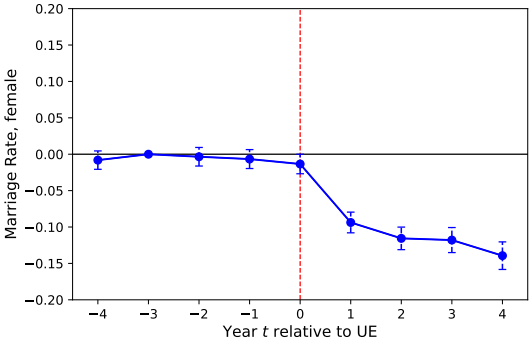
Go back

Event Study: Marriage Rate around UE Transition

Male



Female

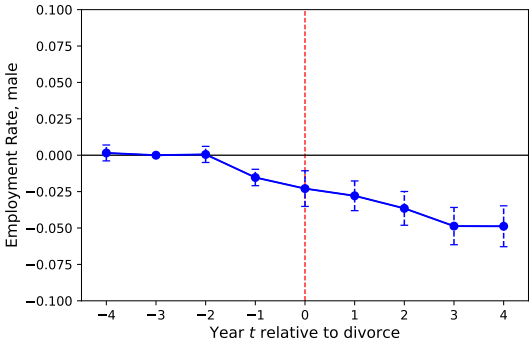


- Relative to matched control group: no UE Transition, matched in $t-3$.

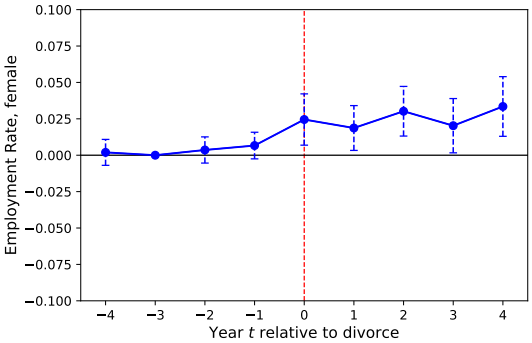
Go back

Event Study: Employment Rate around Divorce

Male



Female

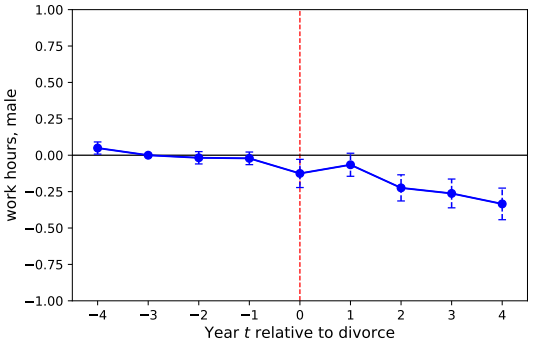


- Relative to matched control group: no divorce, matched in $t-3$.

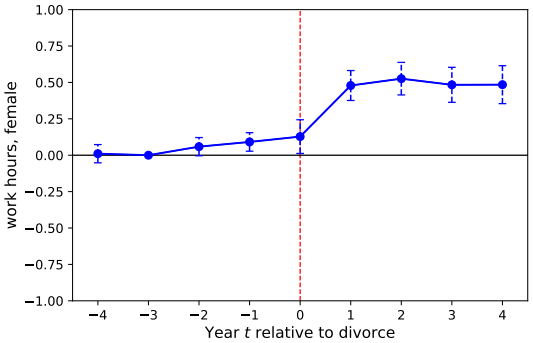
Go back

Event Study: Work Hours around Divorce

Male



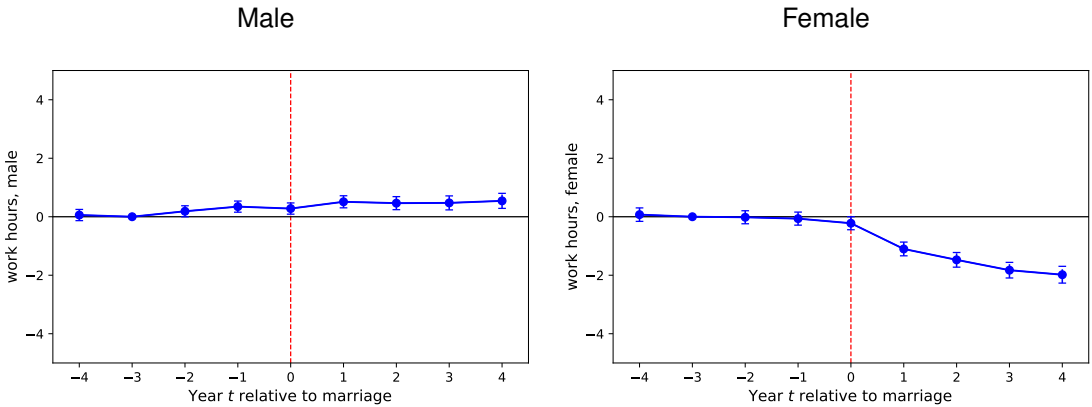
Female



- Relative to matched control group: no divorce, matched in $t-3$.

Go back

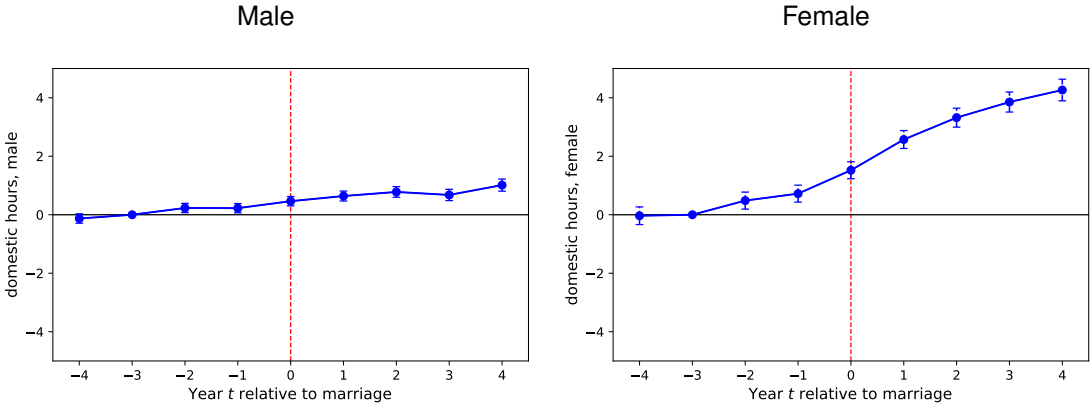
Event Study: Work Hours around Marriage



- Relative to matched control group: no divorce, matched in $t-3$.

Go back

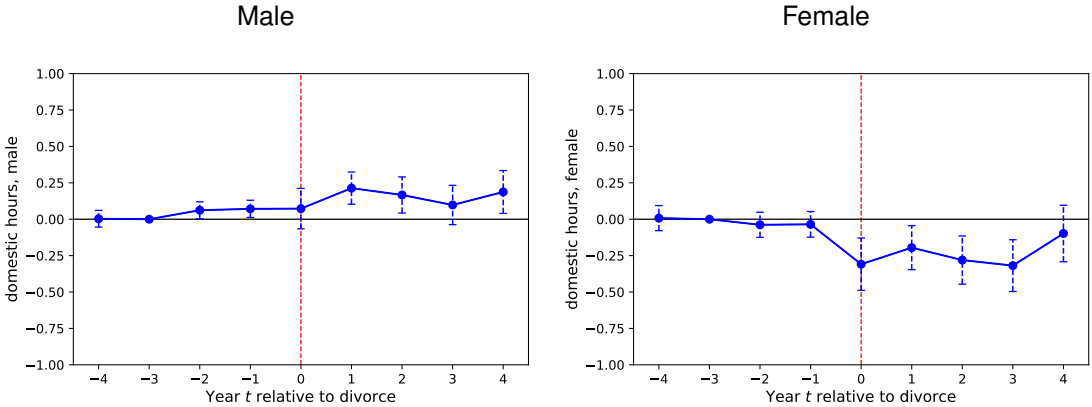
Event Study: Domestic Hours around Marriage



- Relative to matched control group: no divorce, matched in $t-3$.

Go back

Event Study: Domestic Hours around Divorce



- Relative to matched control group: no divorce, matched in $t-3$.

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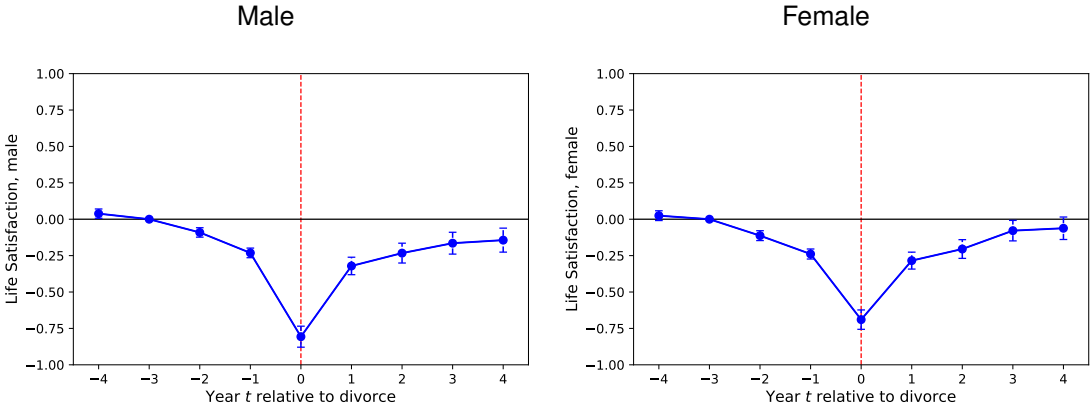
Event Study: Life Satisfaction around Divorce



- Relative to matched control group: no divorce, matched in $t - 3$.

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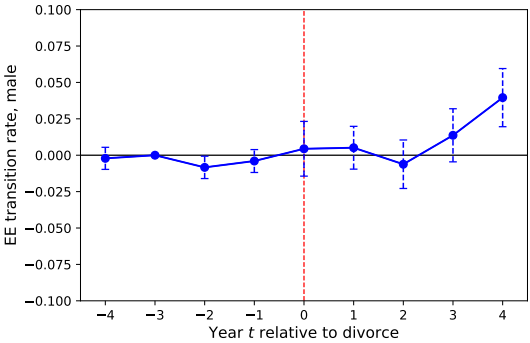
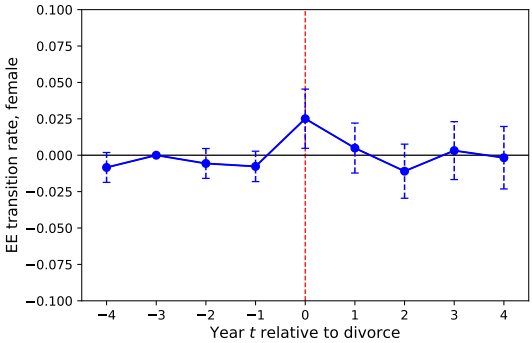
Event Study: EE Rate around Divorce

Male



Female



- Relative to matched control group: no divorce, matched in $t-3$.

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Identification

- Marriage market transitions identify the parameters $\{\lambda^{\cdots}, \mu_z, \sigma_z, \delta\}$.
- Labor market transitions identify the parameters $\{\beta_{\mu\ldots}\}$, $\{\beta_{\vdots\vdots\ldots}\}$, and $\{\beta_{q\ldots}\}$.
- The reservation wage of unemployed individuals is a function of the difference in working hours and the household public good.
- The job finding probability linked to a certain reservation wage therefore identifies the preference parameters $\{\zeta_x, \zeta_y\}$ given the observed difference in working hours $l_j^u - l_j^e$.
- Household public good production parameters $\{\alpha_x, \alpha_y\}$ cannot be directly identified, since we do not observe the difference in the household public good $X_j^u - X_j^e$.
- To identify household public good parameters via job finding, we need to tie down the household public good for one labor market status.
- We use the time input into household production while being unemployed.

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Theoretical moments 1: yearly transition probabilities

- Example: unemployed single woman gets married and starts working

$$
\begin{aligned}
\Pr\left[s_j^u \to \int_i \sum\nolimits_{-l} m_{ij}^{-le} di\right] &= \int_0^1 \lambda_j^u e^{-\lambda_j^u t} dt \int_0^1 \tau_j^u e^{-\tau_j^u t} dt \\
&\quad + \int_0^1 \tau_j^u e^{-\tau_j^u t} \left(\int_t^1 \lambda_j^e e^{-\lambda_j^e x} dx - \int_t^1 \lambda_j^u e^{-\lambda_j^u x} dx \right) dt \\
&\quad + \int_0^1 \lambda_j^u e^{-\lambda_j^u t} \left(\int_t^1 \widehat{\tau}_{j,i}^{u,-l} e^{-\widehat{\tau}_{j,i}^{u,-l} x} dx - \int_t^1 \tau_j^u e^{-\tau_j^u x} dx \right) dt, \\
&= \frac{\tau_j^u}{\lambda_j^e + \tau_j^u} \left(1 - e^{-\left(\lambda_j^e + \tau_j^u\right)}\right) - \left(1 - e^{-\tau_j^u}\right) e^{-\lambda_j^e} \\
&\quad + \frac{\lambda_j^u}{\lambda_j^u + \widehat{\tau}_{j,i}^{u,-l}} \left(1 - e^{-\left(\lambda_j^u + \widehat{\tau}_{j,i}^{u,-l}\right)}\right) - \left(1 - e^{-\lambda_j^u}\right) e^{-\widehat{\tau}_{j,i}^{u,-l}}.
\end{aligned}
$$

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Theoretical moments 2: domestic hours

- Example: unemployed singles:

$$h_i^u = \left(\frac{\alpha_y}{\zeta_y}\right)^{1/(1-\alpha_y)} X_i^u \text{ and } h_j^u = \left(\frac{\alpha_x}{\zeta_x}\right)^{1/(1-\alpha_x)} X_j^u$$

- Example: unemployed married women with unemployed husband.

$$h_{j,i}^{u,u} = \frac{\int_{z_{ij}^{uu}}^{\infty} z' dG(z')}{\int_{z_{ij}^{uu}}^{\infty} dG(z')} X_{ij}^{uu} \left(2\frac{\gamma_y}{\zeta_y}\right)^{\gamma_y/(1-\gamma_y-\gamma_x)} \left(2\frac{\gamma_x}{\zeta_x}\right)^{(1-\gamma_y)/(1-\gamma_y-\gamma_x)}$$

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Theoretical moments 3: wage earnings distribution

- Solving the following differential equation numerically with the boundary condition $H_j\left(\underline{w}_j\right) = 0$ gives the wage earnings distribution $H_j\left(w_j\right)$.

$$\frac{dH_j\left(w_j\right)}{dw_j} = q_j \vartheta_j \frac{1 - H_j + \frac{\int_i \sum_{-l} \int_{z_{ij}^{-lu}}^{\infty} \sigma_{j,i}^{u,-l}\left(R_{j,i}^{u,-l}(z')\right)\left[1-F_j\left(R_{j,i}^{u,-l}(z')\right)\right]\left(I_{w_j > R_{j,i}^{u,-l}(z')} - 1\right) dG(z') m_{ij}^{-lu}}{\sigma_j^e\left(R_j^u\right)\left[1-F_j\left(R_j^u\right)\right]s_j^u + \int_i \sum_{-l} \int_{z_{ij}^{-lu}}^{\infty} \sigma_{j,i}^{u,-l}\left(R_{j,i}^{u,-l}(z')\right)\left[1-F_j\left(R_{j,i}^{u,-l}(z')\right)\right] dG(z') m_{ij}^{-lu}}}{q_j + \mu_j \sigma_j^e\left(w_j\right) e^{-\vartheta_j \max\left[w_j - \underline{w}_j, 0\right]}}.$$

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Estimated Parameter Values I (1993–2017)

Parameter	Symbol	Value	Standard Error
Output elasticity male hours married	γ_y	0.061323	0.021414
Output elasticity female hours married	γ_x	0.294871	0.019642
HH public good EE	X_{ij}^{ee}	1.548974	0.068714
HH public good EU	X_{ij}^{eu}	1.350209	0.078273
HH public good UE	X_{ij}^{ue}	0.868113	0.015459
Wage offer dist shape female	ϑ_j	0.624682	0.074795
Wage offer dist shape male	ϑ_i	0.329124	0.023045
HH public good single male E	X_i^e	0.939130	0.012839

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Estimated Parameters Values II (1993–2017)

Parameter	Symbol	Value	Standard Error
Output elasticity male hours single	α_y	0.213736	0.057096
Leisure coefficient male	ζ_y	0.100001	0.032220
HH public good single female E	X_j^e	1.682180	0.036696
Output elasticity female hours single	α_x	0.364880	0.032255
Leisure coefficient female	ζ_x	0.216164	0.024980
Quit rate female	q_j	0.095941	0.001725
Quit rate male	q_i	0.012372	0.000486
Love shock arrival rate	δ	0.078570	0.010320

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Estimated Parameters Values III (1993–2017)

Parameter	Symbol	Value	Standard Error
Marriage market matching efficiency	ϕ	0.036762	0.016128
Male bargaining power	β_y	0.404279	0.248721
Labor market matching efficiency female	μ_j	0.219364	0.056159
Labor market matching efficiency male	μ_i	0.131590	0.023248
Love shock standard deviation	σ_z	0.568898	0.113556
Love shock mean	μ_z	0.792456	0.060588

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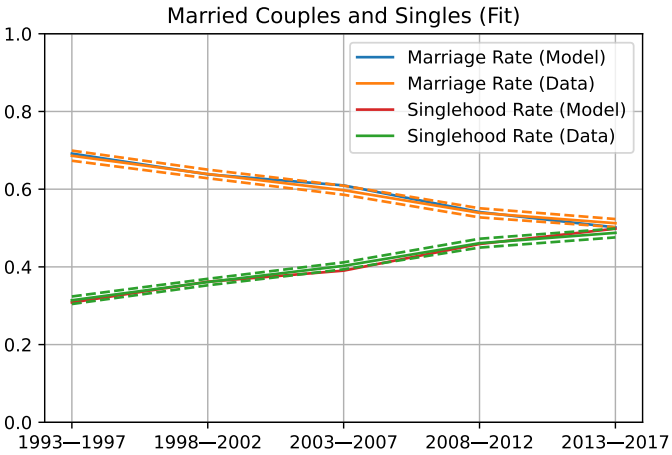
Fit: Marriage Market



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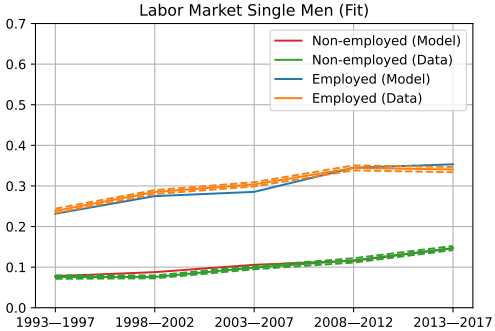
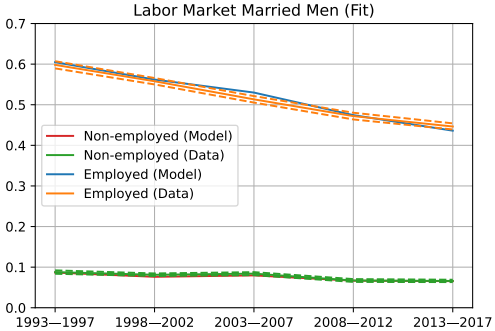
Fit: Labor Market Men





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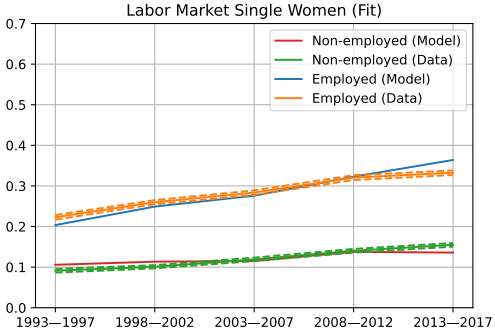
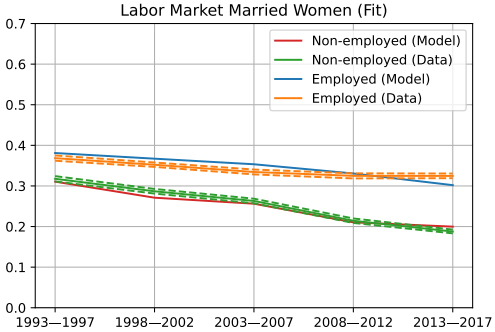
Fit: Labor Market Women





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Re-estimate Key Parameters

Table: Estimated Labor and Marriage Market Parameters Over Time

Parameter	Symbol	93–97	98–02	03–07	08–12	13–17
Wage offer dist shape female	ϑ_j	0.758	0.753	0.857	0.497	0.743
Wage offer dist shape male	ϑ_i	0.451	0.375	0.347	0.294	0.469
Quit rate female	q_j	0.103	0.105	0.085	0.090	0.090
Quit rate male	q_i	0.019	0.015	0.011	0.010	0.010
Matching efficiency female	μ_j	0.219	0.258	0.343	0.188	0.229
Matching efficiency male	μ_i	0.193	0.168	0.144	0.123	0.364
Love shock arrival rate	δ	0.109	0.117	0.088	0.070	0.062
Marriage market matching efficiency	ϕ	0.032	0.073	0.063	0.026	0.024

Source: Authors' calculations based on the SOEP.

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