Marriage and Divorce under Labor Market Uncertainty

Christian Holzner[1] and Bastian Schulz[2]

[1]Hochschule München, CESifo
[2]Aarhus University, the Dale T. Mortensen Centre, IZA, CESifo

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    - Female work hours increase around divorce, and mainly *before* separation.
      (PSID, Johnson & Skinner, 1986; Mazzocco et al., 2013, 2014).
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      follow traditional gender roles (Parental leave division, Swedish data, Folcke & Rickne, 2020).

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      follow traditional gender roles (Parental leave division, Swedish data, Folcke & Rickne, 2020).

- In this paper, we study couples' job search strategies (joint search).

- We show how (endogenous) labor market transitions affect marital stability.

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- Most existing work holds either the labor or the marriage market "fixed". `Literature`

- We propose a model of simultaneous search in marriage and labor markets.
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    - Individuals look for partners in the marriage market and for jobs in the labor market.
    - The labor market status affects partnership formation and marital stability.
    - Being married—and to whom—affects the job-search strategy.
        - → Joint equilibrium of labor market outcomes and marriage market statuses.
    - Labor market search intensity depends on (foregone) marital surplus.
    - Possibility of endogenous divorce in response to labor market transitions.

Marriage & Divorce

- Why do individuals get married? $\rightarrow$ *Marital surplus*
  - A match-specific "love" shock.
  - Public good, depends on domestic time inputs and preferences/productivity.
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- Aggregate developments in the labor market can have feedback effects on marriage.

Preview of Results

- Structural estimation using German household-survey data (GSOEP, 1993–2017).

- Between 0 and 70% of labor market transition divorces, depending on the couple type $\in \{EE, EU, UE, UU\}$.

- Counterfactuals: marriage market effect of the "German labor market miracle."
  - More divorces due to married women's transitions into employment.
  - Fewer divorces due to married men's transitions into unemployment (dominates).

Outline

1 Empirical Facts

2 Model

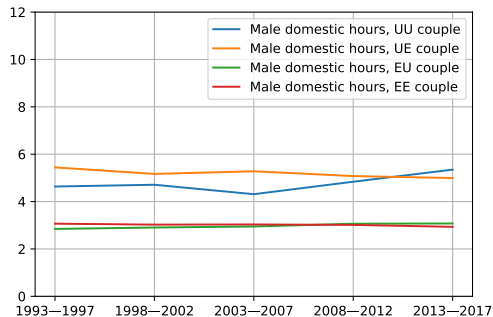**3** Estimation

4 Application

Empirical Facts

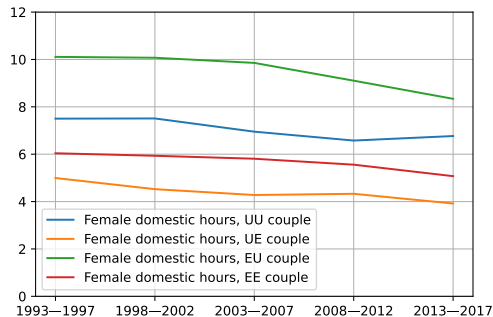# Population Shares and Couple Types over Time
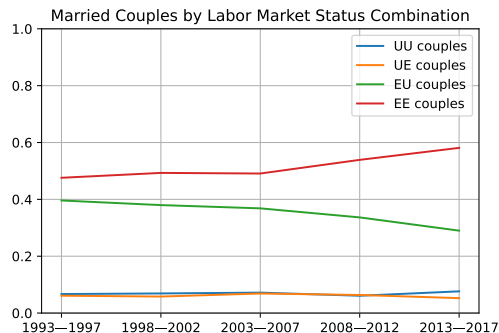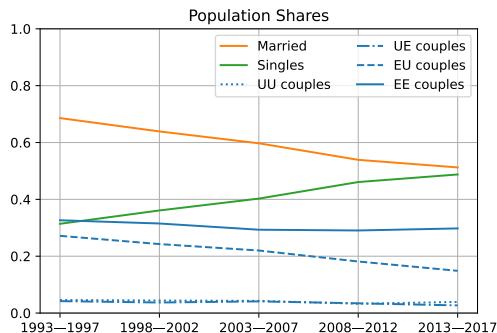
- EE denotes both employed, EU is a "male breadwinner" couple, etc.
- U ranges from inactivity to small part-time contracts of up to 3h per day.

Domestic Work Hours over Time

Married Males

Married females

- Domestic work hours include childcare, errands, repairs, routine chores.

More Details on Time Inputs

Model

Model Overview

- Marriage market:
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- Marital surplus depends on:
    - Match-specific "love shock"'.
    - Domestic time inputs, which depend on labor market status.
    - Productivity of male/female domestic hours and "preference" parameters.

Utility and Marital Surplus

- Quasi-linear preferences in consumption c_f, leisure e_f, and public good y.

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

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- Private consumption: $c_f = I_j^l + t$ and $c_m = I_i^{-l} - t$.

- Time constraints: $h_f = \overline{h} - \overline{l}_j^l - e_f$ and $h_m = \overline{h} - \overline{l}_i^l - e_m$.

Fixing Ideas

- Linearity in consumption implies that income changes affects the couples' joint utility in the same way as single utilities.
  - ⇒ Surplus is independent of spouses' income.
  - ⇒ EE transitions do not lead to divorce. (Evidence)

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- Transition into employment: less time available, but X_{ij}^{-ll} may increase.

- Transition out of employment: more time available, but X_{ij}^{-ll} may decrease.

- X_{ij}^{-ll} absorbs effects of income changes that correlate with UE/EU transitions as well as social norms, e.g., differences in utility between EU and UE couples.

- We estimate $X_{ij}^{ee} > X_{ij}^{eu} > X_{ij}^{uu} > X_{ij}^{ue}$.

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- Given the love shock, households maximize the surplus by setting optimal home hours and search intensities. `Marital Surplus` `Optimal search intensities`
  - Define endogenous love-shock thresholds $S_{ij}^{-ll}\left(z_{ij}^{-ll}\right) = 0$
  - Define marriage probability $\alpha_{ij}^{-ll} = \left(1 - G\left(z_{ij}^{-ll}\right)\right)$

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- Couples reoptimize when match-specific shock or labor market transition occurs.

- No commitment, efficient divorce in case of negative surplus.

Flow Equation System

$$\text{EE:} \quad \lambda \alpha_{ij}^{ee} s_i^e s_j^e + \bar{\tau}_{i,j}^{u,e} m_{ij}^{ue} + \bar{\tau}_{j,i}^{u,e} m_{ij}^{eu} = \left[\delta \left(1 - \alpha_{ij}^{ee} \right) + \underbrace{\underline{\tau}_{i,j}^{e,e} + \bar{\tau}_{i,j}^{e,e} + \underline{\tau}_{j,i}^{e,e} + \bar{\tau}_{j,i}^{e,e}}_{\text{job-loss rates}} \right] m_{ij}^{ee}$$

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- Outflow consists of
  - divorces due to shocks, $\delta\left(1 - \alpha_{ij}^{-ll}\right)$
  - labor market transitions that lead to a divorce, $\{\underline{\tau}_{i,j}^{-l,l}, \underline{\tau}_{j,i}^{l,-l}\}$
  - labor market transitions that transform the couple into a different type $\{\bar{\tau}_{i,j}^{-l,l}, \bar{\tau}_{j,i}^{l,-l}\}$

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- Define $\underline{\tau}_{j,i}^{u,-l}$ using the love-shock thresholds:

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

Reservation Wages: Singles

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

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- The reservation wage of an unemployed single (defined by $V_j^e\left(R_j^u\right) = V_j^u\left(b_j\right)$), is

$$R_j^u = b_j - \zeta_x\left(\bar{l}_j^u - \bar{l}_j^e\right) + \xi_y\left(X_j^u - X_j^e\right) + \lambda\beta_x \int_i \sum_{-l}\left(\overline{S}_{z_{ij}^{-lu}}^{-lu} - \overline{S}_{z_{ij}^{-le}}^{-le}\right)s_i^{-l}di.$$

where $\bar{S}_{z_{ij}^{-ll}}^{-ll} \equiv \int_{z_{ij}^{-ll}}^{\infty} S_{ij}^{-ll}(z)dG(z)$.

Reservation Wages: Married

- Unemployed married female j with a partner of type i and emp. status $-l$.

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

- A married individual faces on top of a single individual additional gains or losses associated with the effect of a changed labor market status on marital surplus.

Interaction with Love Shock

- Consider what happens when the couple is hit by a negative love shock:
    - decrease the reservation wage (due to lower marital surplus) and
    - increase the labor market search intensity of the unemployed spouse.
    - make a transition into employment more likely.
    - make a divorce more likely.

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- Labor market transitions affect marital (in)stability:
    - Transitions into and out of employment may lower marital surplus.
    - If the surplus falls, couple may be closer to the threshold after a transition occurs.
    - Next love shock is more likely to trigger divorce.
    - Second round effects.

Search Equilibrium

- The equilibrium is characterized by:
    - a set of surplus functions $S_{ij}^{ll}(z)$,
    - search intensities for unemployed married and single individuals, $\{\widehat{\sigma}_i^{u,l}(z), \widehat{\sigma}_j^{u,-l}(z)\}$ and $\{\widehat{\sigma}_i^u, \widehat{\sigma}_j^u\}$,
    - love shock threshold values z_{ij}^{ll},
    - the distributions of married couples m_{ij}^{ll} for each type ij and labor market status ll,
    - and single distributions s_i^l, s_j^l.

- Solution algorithm: alternating fixed-point iterations, three model blocks. `Details`

Estimation

Structural Estimation

- Multiple versions: employment status heterogeneity (today),
  + heterogeneous education, age, number of children (one or two-dim. het.).

- Yearly data, we allow for simultaneous labor and marriage market transitions.

- 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 parameters fixed at the 1993–1997 level.
    - Compare model-implied counterfactual and actual developments.

Love Shock Divorces

- $\delta \left(1 - \alpha_{ij}^{-ll} \right)$ divided by total divorces for couple type over time:
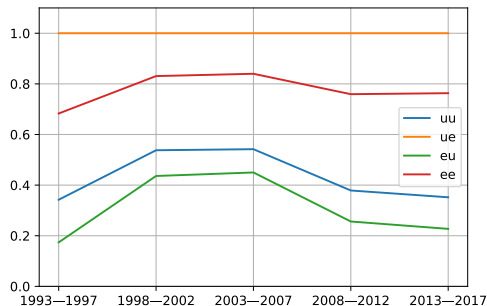
Share of Love Shock Divorces
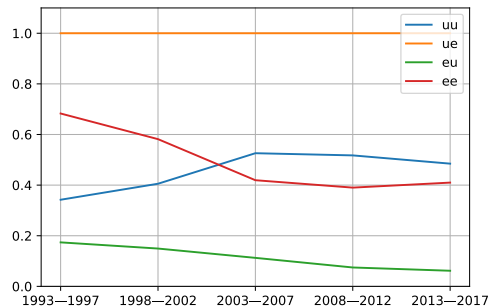
Counterfactual (labor market fixed 93–97)

Labor Market Transition Divorce, Male Transition

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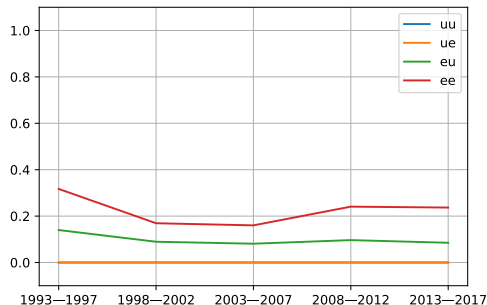
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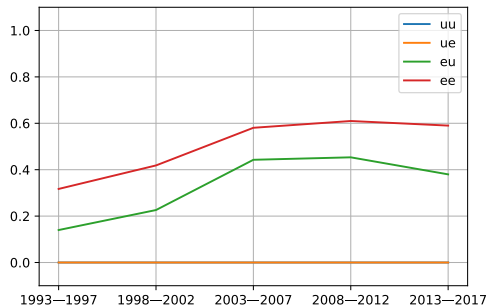
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Labor Market Transition Divorce, Female Transition

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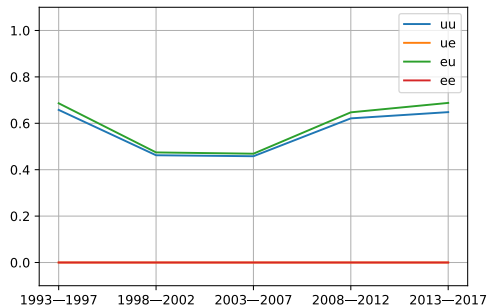
Labor Market Divorce Share Women
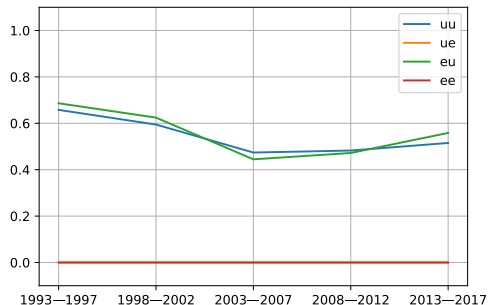
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Divorce Share by Transition Type

- $\underline{\tau}_{i,j}^{-l,l}\left(\underline{\tau}_{j,i}^{l,-l}\right)$ divided by $\underline{\tau}_{i,j}^{-l,l} + \bar{\tau}_{i,j}^{-l,l}\left(\underline{\tau}_{j,i}^{l,-l} + \bar{\tau}_{j,i}^{l,-l}\right)$ for transition type over time:
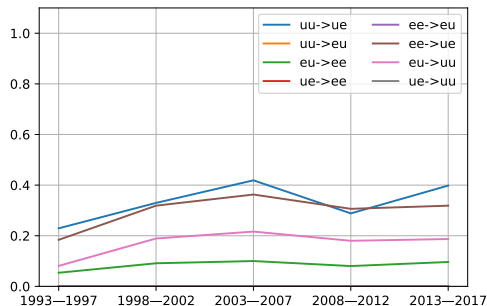
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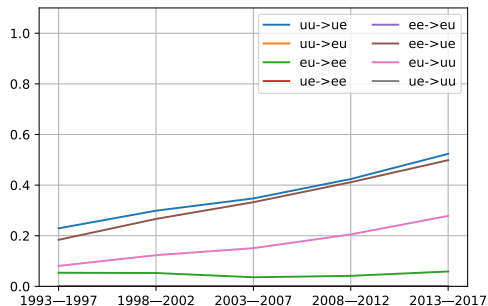
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Conclusions

- We present a model of simultaneous search in marriage and labor market.

- Endogenous divorce as a result of labor market transitions.

- We apply the model to the "German labor market miracle":
  - significant feedback effects on the marriage market
  - more divorces due to female transitions into employment
  - fewer divorces to male transitions into unemployment (dominates).
  - potential second-round effects, more low-surplus couples.

- In ongoing work, we study effects of labor market transition divorces on marital sorting and inequality with more heterogeneity.

Thank you for your attention.

Bastian Schulz

bastian.schulz@econ.au.dk

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).

- Joint search: Guler et al. (2012), Pilossoph & Wee (2021), Fang & Shephard (2019).

- Most related: Goussé et al. (2017), Greenwood et al. (2016), Flabbi & Flinn (2015)

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

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- 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

Employment Rates over Time
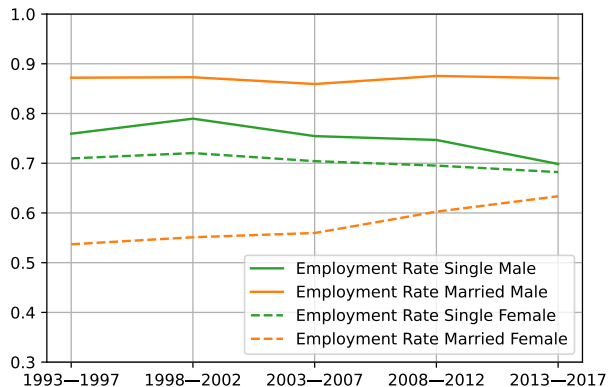
Event Study: Part-time to full-time transitions around Divorce

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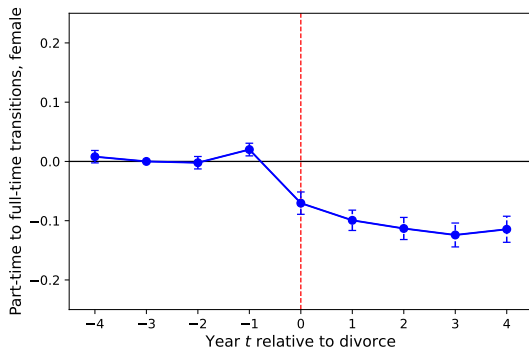
Male
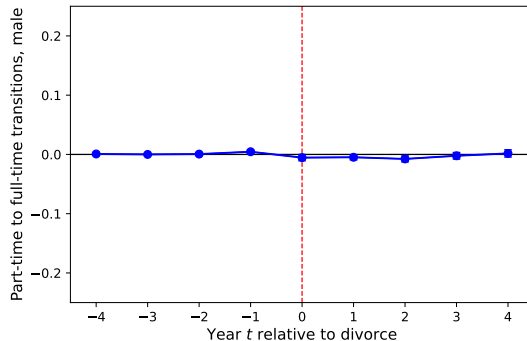
- Relative to matched control group: no divorce, matched in $t - 3$.

Marriage and Cohabitation
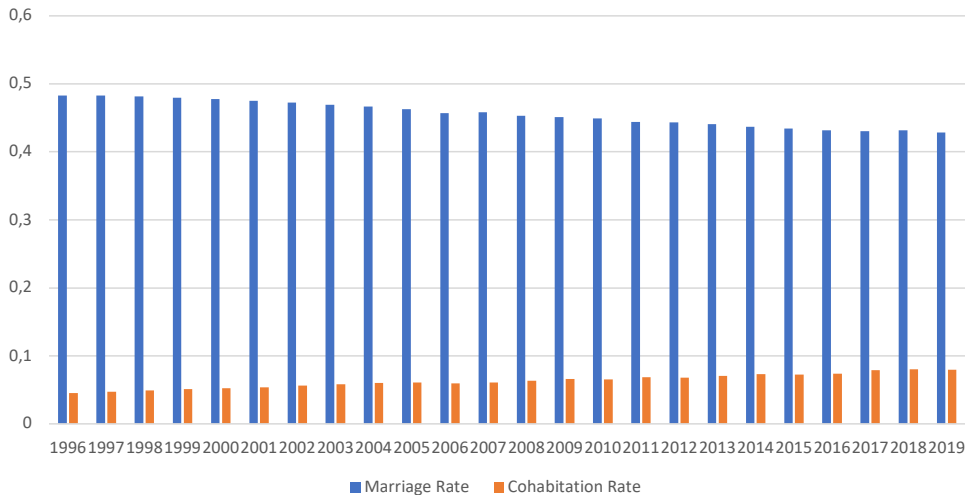
Go back

Unemployment Rate and Major Labor Market Reforms
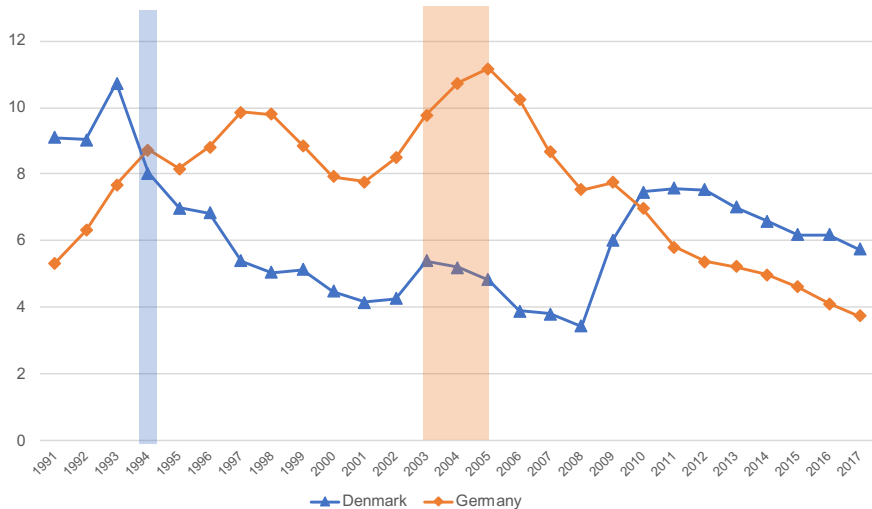
Bargaining - No Commitment

- 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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is maximized subject to participation and feasibility constraints.

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

$$rV_j^{l,-l}\left(z, I_i^{-l}, I_j^l\right) = u_j^{l,-l}\left(z, I_i^{-l}, I_j^l\right)$$

$$+ \quad \delta \int \left[\max\left[V_j^l\left(I_j^l\right), V_j^{l,-l}\left(z', I_i^{-l}, I_j^l\right)\right] - V_j^{l,-l}\left(z, I_i^{-l}, I_j^l\right)\right] dG\left(z'\right)$$

$$+ \quad \widehat{\sigma}_{j,i}^{l,-l}\mu_j \int_{R_j^{l,-l}(z, I_i^{-l}, I_j^l)} \left[\max\left[V_j^e\left(w_j'\right), V_j^{e,-l}\left(z, I_i^{-l}, w_j'\right)\right]\right.$$

$$- \quad \left. V_j^{l,-l}\left(z, I_i^{-l}, I_j^l\right)\right] dF_j\left(w_j'\right) - c\left(\widehat{\sigma}_{j,i}^{l,-l}\right)$$

$$+ \quad \widehat{\sigma}_{i,j}^{-l,l}\mu_i \int_{R_i^{-l,l}(z, I_i^{-l}, I_j^l)} \left[\max\left[V_j^l\left(I_j^l\right), V_j^{l,e}\left(z, w_i', I_j^l\right)\right] - V_j^{l,-l}\left(z, I_i^{-l}, I_j^l\right)\right] dF_i\left(w_i'\right)$$

$$+ \quad q_j\left[\max\left[V_j^u\left(b_j\right), V_j^{u,-l}\left(z, I_i^{-l}, b_j\right)\right] - V_j^{l,-l}\left(z, I_i^{-l}, I_j^l\right)\right] \mathbb{1}\left[l = e\right]$$

$$+ \quad q_i\left[\max\left[V_j^l\left(I_j^l\right), V_j^{l,u}\left(z, b_i, I_j^l\right)\right] - V_j^{l,-l}\left(z, I_i^{-l}, I_j^l\right)\right] \mathbb{1}\left[-l = e\right]$$

The Surplus of Marriage

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

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

Optimal Search Intensities

- Different for married unemployed workers, who adjust time input if they start working.

- Marital utility changes with the labor market status.

- The reservation wage of an unemployed married individual thus depends on the shock z.

$$
\begin{aligned}
c'\left(\sigma_{j,i}^{u,-l}\left(R_{j,i}^{u,-l}(z)\right)\right) = & c'\left(\sigma_{j,i}^{e,-l}\left(R_{j,i}^{u,-l}(z)\right)\right) \\
& + \frac{\mu_j}{r}\left[R_j^u - R_{j,i}^{u,-l}(z)\right]\left[1 - F_j\left(R_{j,i}^{u,-l}(z)\right)\right]
\end{aligned}
\tag{2}
$$

- The search intensity of an unemployed married individual differs from the one of an employed married individual due to the associated losses or gains in the marital surplus, captured by the difference in the respective reservation wages.

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.

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

Go back

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

Go back

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

Identification

- No simple one-to-one mapping between moments and parameters.
- Marriage market transitions identify $\{\phi, \mu_z, \sigma_z, \delta\}$.
- Employment-to-unemployment transitions identify the quit parameters $\{q_i, q_j\}$.
- Unemployment-to-employment transitions identify $\{\mu_i, \mu_j\}$.
- EE transitions identify $\{\vartheta_i, \vartheta_j\}$.
- $\{X_{ij}^{ee}, X_{ij}^{eu}, X_{ij}^{ue}\}$ and $\{\alpha_y, \alpha_x, \gamma_y, \gamma_x, \}$ are identified by home production time inputs.
- The job-finding probability linked to a certain reservation wage identifies the preference parameters $\{\zeta_y, \zeta_x\}$ given the observed difference in working hours $l_j^u - l_j^e$.

Go back

Most important moments

- $\{\gamma_y, \gamma_y\}$: within-gender differences in domestic time inputs across couple types.

- $\{X_{ij}^{ee}, X_{ij}^{eu}, X_{ij}^{ue}\}$: population shares of couple types, inflows (marriage rates).

- $\{X_j^e, X_i^e, \alpha_y, \alpha_x, \zeta_y, \zeta_x\}$: domestic time inputs of singles.

- $\{\vartheta_i, \vartheta_j\}$: wage-earnings distribution moments.

- $\{q_i, q_j, \mu_i, \mu_j\}$: population shares of (un)employed singles, wage-earnings distribution moments.

- $\{\delta, \phi\}$: population shares of couple types, outflows (divorce rates).

- $\{\beta_y\}$: across-gender differences in time inputs within couple types.

- $\{\mu_z, \sigma_z\}$: population shares of singles.

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
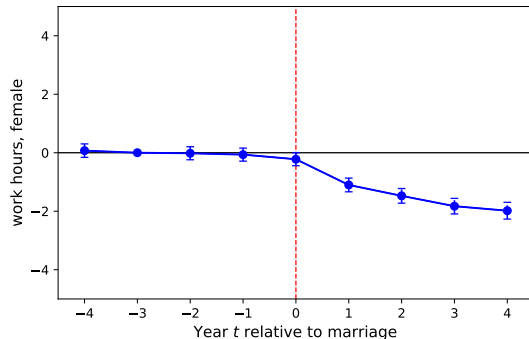
Go back

Event Study: Employment Rate around Marriage

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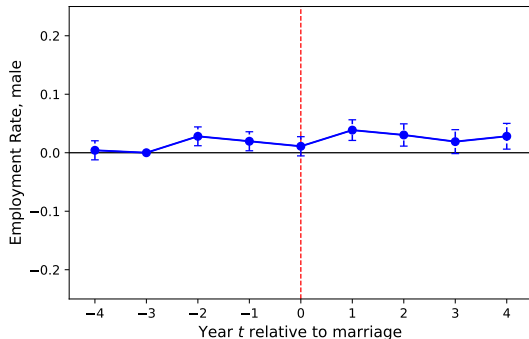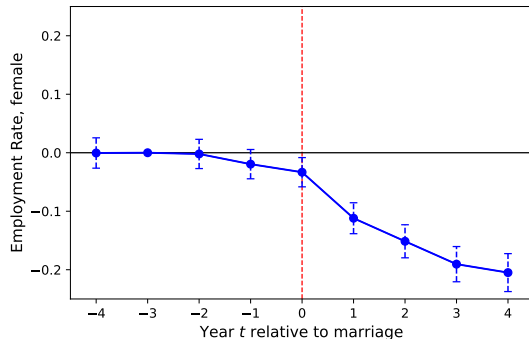
- Relative to matched control group: no marriage, matched in $t-3$.

Go back

Event Study: Marriage Rate around EU Transition
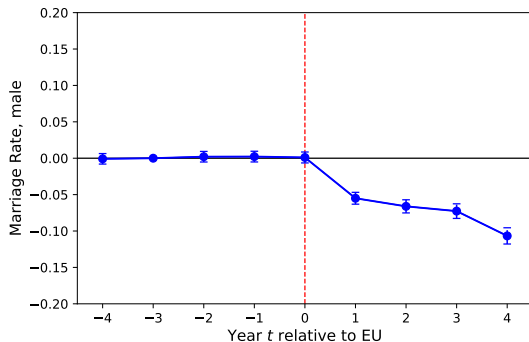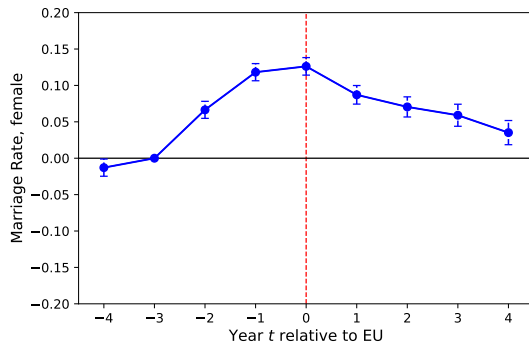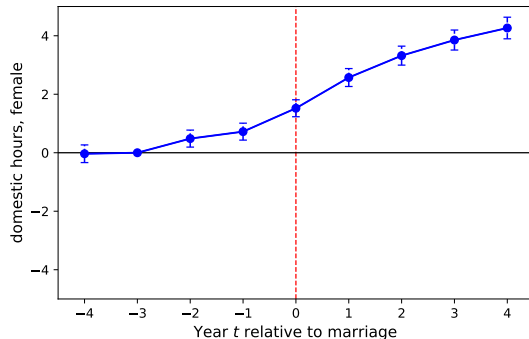

- Relative to matched control group: no EU Transition, matched in $t-3$.

Go back

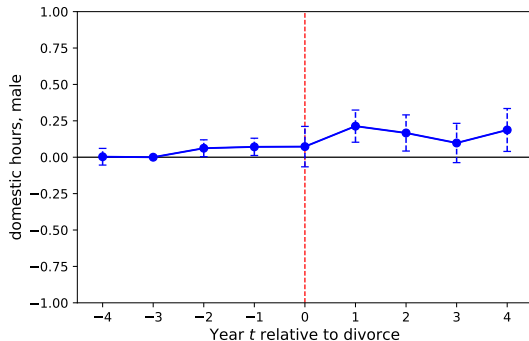# Event Study: Marriage Rate around UE Transition
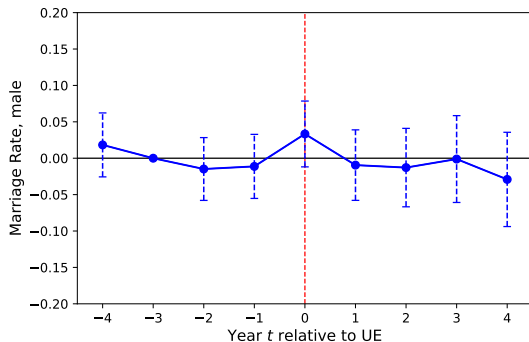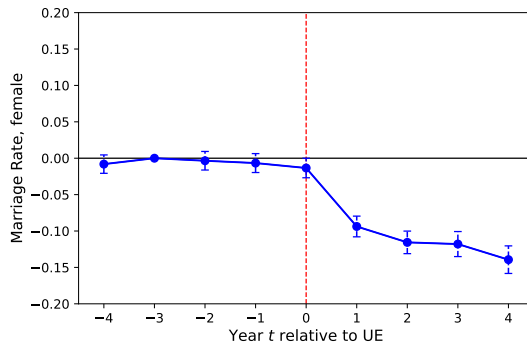
- Relative to matched control group: no UE Transition, matched in $t - 3$.

Event Study: Employment Rate around Divorce
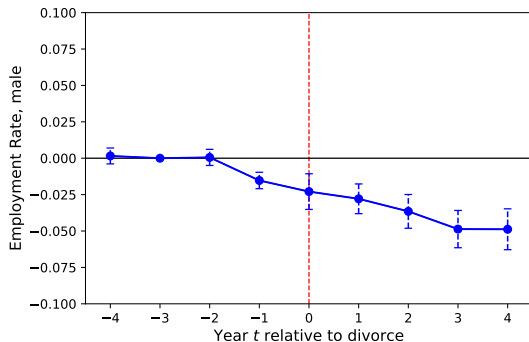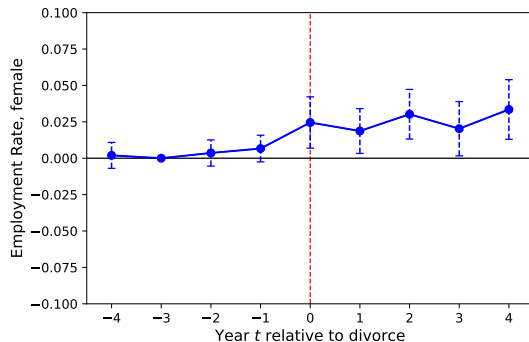
Male   Female

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

Go back

Event Study: Work Hours around Divorce
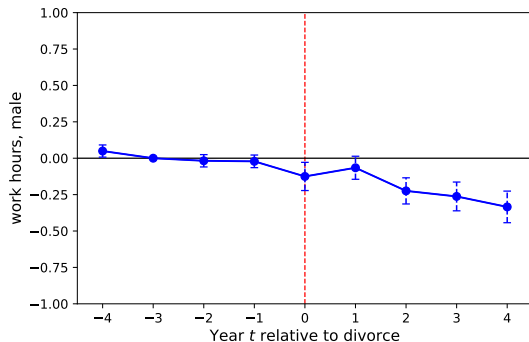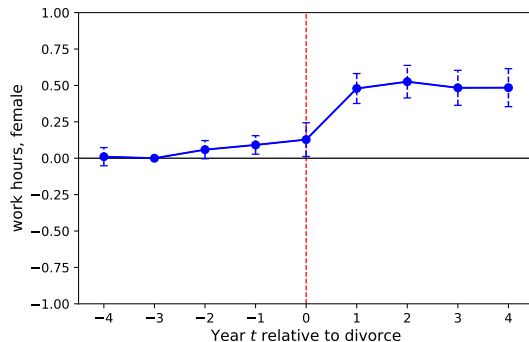
Male

Female

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

Go back

Event Study: Work Hours around Marriage
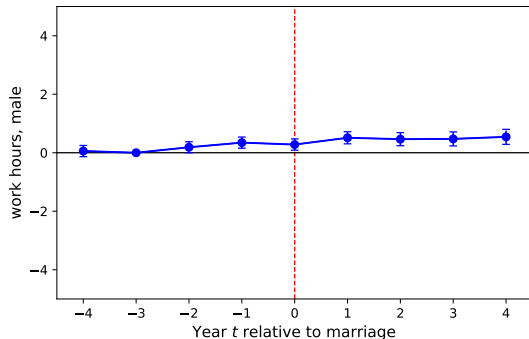
Male   Female

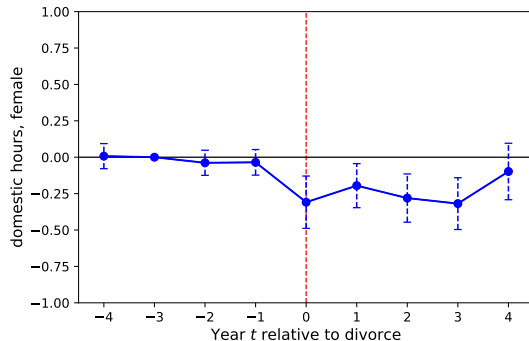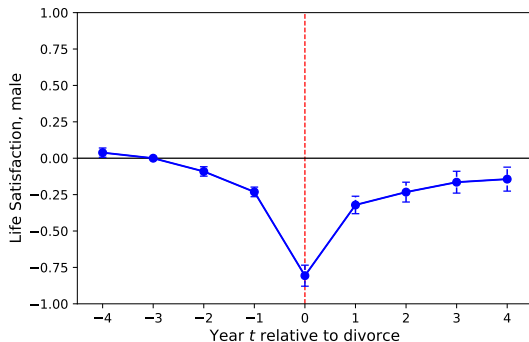- Relative to matched control group: no divorce, matched in $t-3$.

Go back

Event Study: Domestic Hours around Marriage
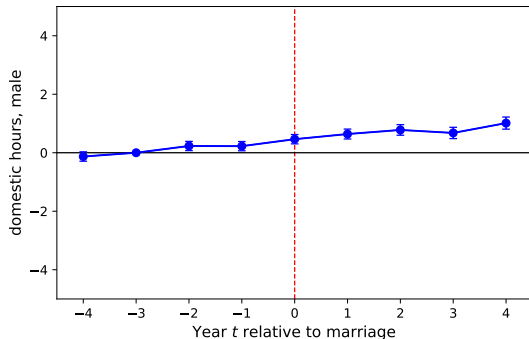
Male

Female

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

Event Study: Domestic Hours around Divorce

Male   Female

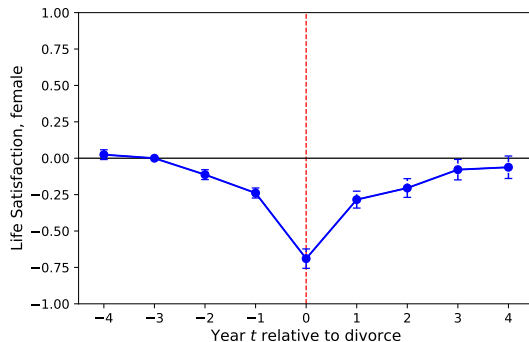- Relative to matched control group: no divorce, matched in $t-3$.

Go back

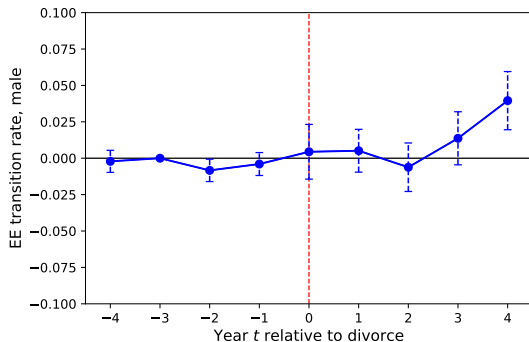# Event Study: Life Satisfaction around Divorce

Male

Female

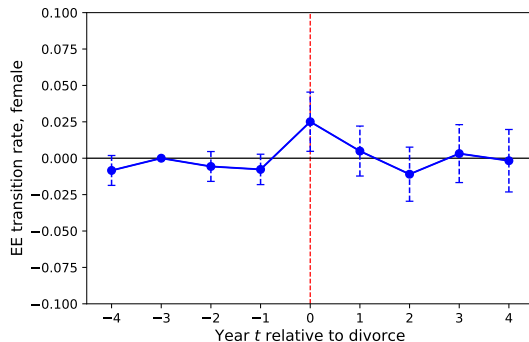- Relative to matched control group: no divorce, matched in $t-3$.

Go back

Event Study: EE Rate around Divorce

Male   Female

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

Go back

Theoretical moments 1: yearly transition probabilities

- Example: unemployed single woman gets married and starts working

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

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.

$$h_{j,i}^{u,u} = \frac{\int\limits_{z_{ij}^{uu}}^{\infty} z' dG(z')}{\int\limits_{z_{ij}^{uu}}^{\infty} dG(z')} X_{ij}^{uu} \left(2\frac{\gamma_y}{\zeta_y}\right)^{\gamma_y/(1-\gamma_y-\gamma_x)} \left(2\frac{\gamma_x}{\zeta_x}\right)^{(1-\gamma_y)/(1-\gamma_y-\gamma_x)}$$
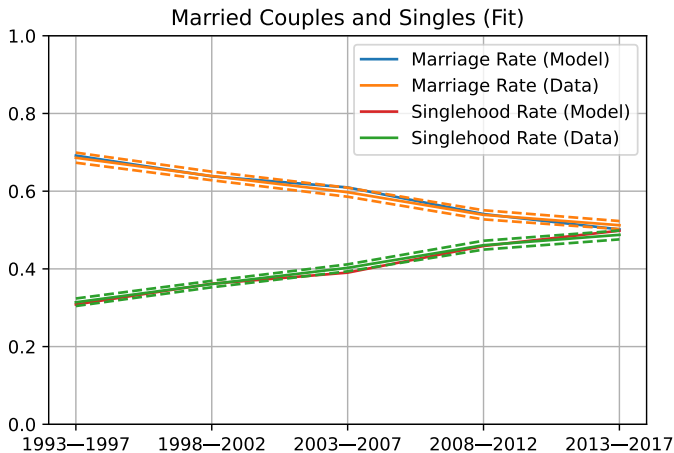
Theoretical moments 3: wage earnings distribution

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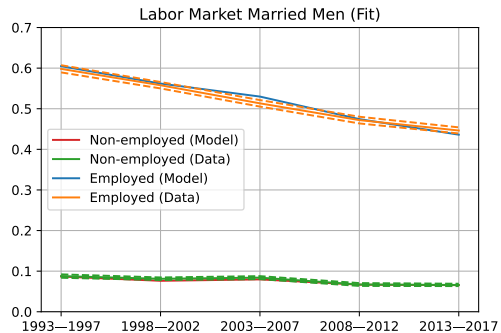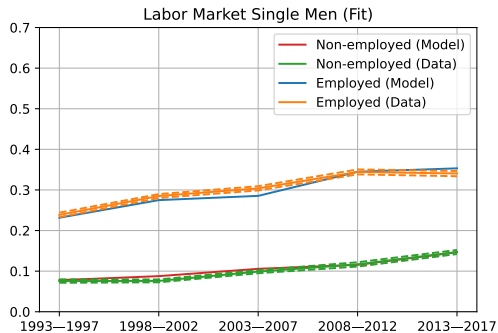
$$\frac{dH_j\left(w_j\right)}{dw_j} = q_j \vartheta_j \frac{1 - H_j + \frac{\int_i \sum_{-l} \int_{z_{ij}^{-lu}}^{\infty} \sigma_{j,i}^{u,-l}\left(R_{j,i}^{u,-l}(z')\right)\left[1 - F_j\left(R_{j,i}^{u,-l}(z')\right)\right]\left(I_{w_j > R_{j,i}^{u,-l}(z')} - 1\right) dG(z') m_{ij}^{-lu}}{\sigma_j^e\left(R_j^u\right)\left[1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

Fit: Marriage Market

Married Couples and Singles (Fit)

Legend:
- Marriage Rate (Model)
- Marriage Rate (Data)
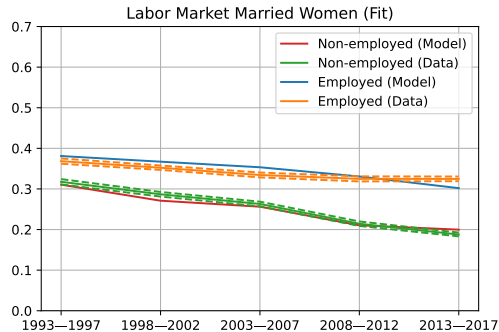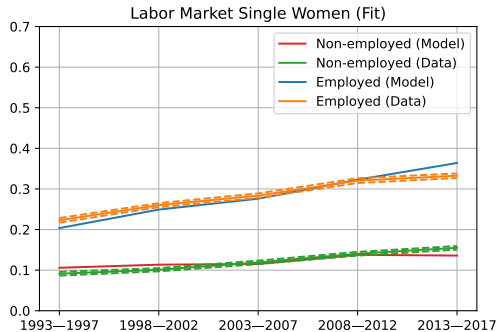- Singlehood Rate (Model)
- Singlehood Rate (Data)

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Fit: Labor Market Men

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Fit: Labor Market Women

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Re-estimate Labor Market 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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