Divorce Laws and Intra-Household Bargaining

Thomas H. Jørgensen

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Plan for today

- Divorce law and intra-household bargaining
  Voena (2015): "Yours, Mine, and Ours: Do Divorce Laws Affect the Intertemporal Behavior of Married Couples?"
  - Limited commitment model as last time
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- **Reading guide:**
  1. What are the main *research questions*?
  2. What is the *(empirical) motivation*?
  3. What are the central *mechanisms in the model*?
  4. What is the *simplest model* in which we could capture these?

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- **Reading guide:**
  1. What are the main *research questions*?
     - How does divorce laws affect saving and female labor supply in marriage?
     - What are the welfare consequences of unilateral divorce?
  2. What is the *(empirical) motivation*?
  3. What are the central *mechanisms in the model*?
  4. What is the *simplest model* in which we could capture these?

Empirical Motivation: I

- **Reduced Form** evidence from the US
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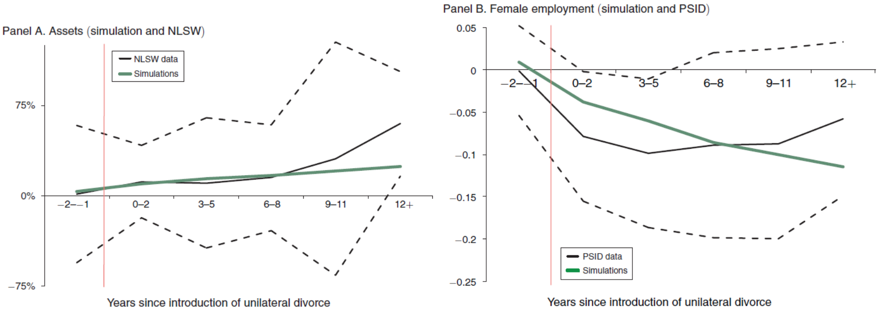

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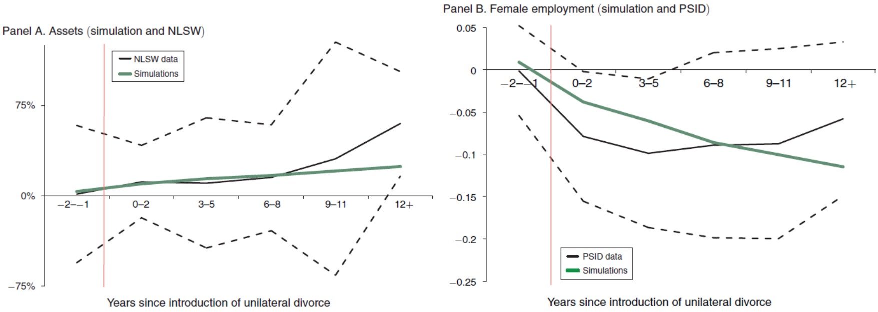

- **Interpretation:** women with *low bargaining power pre-reform:*
  unilateral → threat to leave → increase bargaining power → work less.

Empirical Motivation: II

1. Unilateral vs. mutual consent divorce
   [One can decide vs. both has to agree]
2. Community vs. title-based division of property
   [50-50 vs. individual ownership]

Table: Mutual $\rightarrow$ Unilateral (rows 1+2, Tab. 2).

	Savings	Employment	
Community	$\uparrow$	$\downarrow$	increased power of women (last slide)
Title-based	–	–	no sign. effect (everything is private)

Outline

Model Overview

- **Choices:**
  c_t^j: consumption of member $j \in \{H, W\}$
  P_t^W: labor market participation, wife (men always work)
  A_{t+1}^j: assets of member $j \in \{H, W\}$
  D_t: divorce
- **States** (ω_t)**:**
  A_t^j: assets of member $j \in \{H, W\}$
  z_t^j: income shock (perm)
  ε_t^j: match quality shock (love)
  h_t^W: human capital, wife only.
  Ω_t: divorce laws.
  $(\tilde{\theta}_t^W, \tilde{\theta}_t^H)$: bargaining weights (in unilateral/limited commitment).
  (Childbirth occurs at predetermined ages, perfect foresight)

State Transitions: Income and Human Capital

- **Income** is

$$\log(y_t^j) = \ln(h_t^j) + z_t^j$$
$$z_t^j = z_{t-1}^j + \zeta_t^j, \quad \zeta_t^j \sim iid\mathcal{N}(0, \sigma_{\zeta^j}^2)$$

- **Human capital** is

$$\log(h_t^j) = \log(h_{t-1}^j) - \delta(1 - P_{t-1}^j) + (\lambda_0^j + \lambda_1^j t)P_{t-1}^j$$

- **Why** only need to keep track of h_t^W?

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- **Why** only need to keep track of h_t^W?
  Because since men always work, $P_t^H = 1$, we have

$$\begin{aligned}\log(h_t^H) &= \log(h_{t-1}^H) + (\lambda_0^H + \lambda_1^H t) \\ &= \log(h_{t-2}^H) + (\lambda_0^H + \lambda_1^H(t-1)) + (\lambda_0^H + \lambda_1^H t) \\ &= \underbrace{\log(h_0^H)}_{\text{fixed at e.g. 0?}} + \sum_{s=1}^{t}(\lambda_0^H + \lambda_1^H s)\end{aligned}$$

  If heterogeneity in initial condition, we would solve for a grid of h_0^H.

State Transitions: Love

- **Match quality (love)** is an AR(1) process

$$\xi_t^j = \xi_{t-1}^j + \epsilon_t^j, \quad \epsilon_t^j \sim iid\mathcal{N}(0, \sigma^2)$$

State Transitions: Assets (Inter-temporal Budget)

- $e(k) \geq 1$ is equiv. scale as function of children, k.
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- **Budget constraint** depends on status
  Singles (share childcare costs):

$$A_{t+1}^j = (1+r)A_t^j + (y_t^j - d_t^k/2) \cdot P_t^j - c_t^j \cdot e(k) \tag{1}$$

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Couples ($A_t = A_t^H + A_t^W$):

$$A_{t+1} = (1+r)A_t + y_t^H + (y_t^w - d_t^k)P_t^W - x_t \tag{2}$$

where *expenditures* are (couples have econ. of scale, $\rho \geq 1$)

$$x_t = \left[(c_t^H)^\rho + (c_t^W)^\rho\right]^{\frac{1}{\rho}} e(k)$$

Preferences

- **Individual preferences** are [my notation]

$$u(c_t^i, P_t^i, D_t^i) = \frac{(c_t^i)^{1-\gamma}}{1-\gamma} - \psi P_t^i + \xi_t^i (1 - D_t^i)$$

where
γ is the CRRA coefficient
ψ is the dis-utility of working
ξ_t^i is a marital match shock ("love")

Value of a Divorcee

- **Re-marriage** with prob. $\pi_t^{j\Omega_t}$
  Match with someone similar to j (I think).

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$$V_t^{jDR}(\omega_t) = \pi_t^{j\Omega_t} V_t^{jR}(\omega_t) + (1 - \pi_t^{j\Omega_t}) V_t^{jD}(\omega_t)$$

where V_t^{jR} is *value of re-marriage* (defined next) and

$$\begin{aligned} V_t^{jD}(\omega_t) = \max_{c_t^j, P_t^j} & \, u(c_t^j, P_t^j, 1) \\ & + \beta \underbrace{\{\pi_{t+1}^{j\Omega_t} \mathbb{E}_t[V_{t+1}^{jR}(\omega_{t+1})] + (1 - \pi_{t+1}^{j\Omega_t}) \mathbb{E}_t[V_{t+1}^{jD}(\omega_{t+1})]\}}_{\mathbb{E}_t[V_{t+1}^{jDR}(\omega_{t+1})]} \end{aligned}$$

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  is the *value of remaining divorced* ($V^{s\to s}$ in my notation).
- $V_t^{jD}(\omega_t)$ is also the value of transitioning from marriage to divorce
  $=$ **outside option** ($V^{m\to s}$ in my notation)
  Since there are no divorce costs or other differences

Value of a Remarried

- **Re-marriage** is absorbing. See footnote 7.
- In turn,
$$V_t^{jR}(\omega_t) = u(c^{j*R}, P^{j*R}) + \beta \mathbb{E}_t[V_{t+1}^{jR}(\omega_{t+1})]$$
where
$$c^{W*R}, c^{H*R}, P^{W*R} = \arg\max_{c^W, c^H, P^W} \theta u(c^H, 1, 0) + (1-\theta) u(c^W, P^W, 0) \\ + \beta \mathbb{E}_t[\theta V_{t+1}^{HR}(\omega_{t+1}) + (1-\theta) V_{t+1}^{WR}(\omega_{t+1})]$$

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- This means that, in the model, divorce can only happen once.

Household Planning

- **Two cases:**
  1. *Mutual Consent:* Both must prefer divorce for it to happen.
     Committed by law (there are exceptions).
  2. *Unilateral divorce:* If one prefers divorce, they can divorce.
     Limited commitment.
     See lecture note for my notation, I follow Voena (2015).

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- **Timing-issues** in the published version, I think.
  The bargaining weight is updated in current period.
  (See lecture note)

Household Planning: Mutual Consent

- **Couples** $(D_{t-1} = 0)$ in *mutual consent* regime solve

$$V_t(\omega_t) = \max_{c_t^H, c_t^W P_t^W, A_{t+1}^H, A_{t+1}^W, D_t}$$

$$(1 - D_t)\left(\theta u(c_t^H, 1, 0) + (1-\theta) u(c_t^W, P_t^W, 0) + \beta \mathbb{E}_t[V_t(\omega_{t+1})]\right)$$

$$+ D_t\left(\theta\{u(c_t^H, 1, 1) + \beta \mathbb{E}_t[V_{t+1}^{HDR}(\omega_{t+1})]\}\right.$$

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with *constant bargaining weights* θ and $1 - \theta$.

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with *constant bargaining weights* θ and $1-\theta$.

- **Subject to** non-participation constraints, when $D_t = 1$,

$$V_t^{HD}(\omega_t) = u(c_t^H, 1, 1) + \beta \mathbb{E}_t[V_{t+1}^{HDR}(\omega_{t+1})] > V_t^{HM}(\omega_t)$$
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  Cite Becker (1981) [1991].
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  1. **If bargaining is easy/cost-less** in mutual consent regime
     $\rightarrow$ **similar divorce behavior** in mutual and unilateral expected
  2. **Was the case** in California (he argues, figure 10.1)
     $\rightarrow$ **bargaining** in the mutual consent regime (over asset splits?)

Household Planning: Unilateral Divorce

- **Couples** $(D_{t-1} = 0)$ in *unilateral* regime solve

$$V_t(\omega_t) = \max_{c_t^H, c_t^W P_t^W, A_{t+1}^H, A_{t+1}^W, D_t} \tag{3}$$

$$(1 - D_t)\Big(\tilde{\theta}_{t+1}^H u(c_t^H, 1, 0) + \tilde{\theta}_{t+1}^W u(c_t^W, P_t^W, 0) + \beta \mathbb{E}_t[V_t(\omega_{t+1})]\Big)$$

$$+ D_t\Big(\tilde{\theta}_{t+1}^H \{u(c_t^H, 1, 1) + \beta \mathbb{E}_t[V_{t+1}^{HDR}(\omega_{t+1})]\}$$

$$+ \tilde{\theta}_{t+1}^W \{u(c_t^W, P_t^W, 1) + \beta \mathbb{E}_t[V_{t+1}^{WDR}(\omega_{t+1})]\}\Big)$$

where $\tilde{\theta}_{t+1}^j = \tilde{\theta}_t^j + \mu_t^j$ and μ_t^j are Lagrange multipliers on

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where $\tilde{\theta}_{t+1}^j = \tilde{\theta}_t^j + \mu_t^j$ and μ_t^j are Lagrange multipliers on **participation constraints**, when $D_t = 0$,

$$V_t^{HD}(\omega_t) \leq V_t^{HM}(\omega_t)$$

$$V_t^{WD}(\omega_t) \leq V_t^{WM}(\omega_t)$$

Household Planning: Unilateral Divorce

- **Individual value of *remaining in marriage*** (RHS of constraint) is

$$V_t^{jM}(\omega_t) = u(c_t^{j*}, P_t^{j*}, 0) + \beta \mathbb{E}_t[V_{t+1}^j(\omega_{t+1})]$$

where $c_t^{j*}, P_t^{j*}, A_{t+1}^{j*}$ are optimal choices from eq. (3) and

$$V_{t+1}^j(\omega_{t+1}) = (1 - D_{t+1}^*) V_{t+1}^{jM} + D_{t+1}^* V_{t+1}^{jD}$$

is individual **value of *entering as married*** in $t+1$.

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is individual **value of *entering as married*** in $t+1$.

- **Choices are made as a household** (with weights on individual utility) **individual values** are only based on own utility (and future).

Household Planning: Unilateral Divorce

- **Beginning of period** bargaining weights, $\tilde{\theta}^j_t$, are in ω_t.
- **If both participation constraints are not violated** at $\tilde{\theta}^H_t$ and $\tilde{\theta}^W_t$, the Lagrange multipliers are zero and $\tilde{\theta}^j_{t+1} = \tilde{\theta}^j_t$ is not updated.

Household Planning: Unilateral Divorce

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- **To solve** this model (last time + note)
  1. solve the model for couples assuming they remain together, for a grid of bargaining weights.
  2. If, for a given weight, one spouse is not satisfied ($V_t^{jD} > V_t^{jM}$), update the weight on that spouse until indifferent ($V_t^{jD} = V_t^{jM}$). If the other spouse wants to remain in marriage at this new weight, then update weight and carry on!
     Otherwise, divorce.

Outline

Estimation

- **2-step estimation:**
  1. calibrate (preset) parameters in Table 3+4
  2. estimate by SMM 3 parameters in Table 5

  using policy variation from mutual to unilateral

TABLE 5—ESTIMATED STRUCTURAL PARAMETERS AND MATCH OF THE AUXILIARY MODEL

Parameter	Symbol	Estimate	Standard error
Standard deviation of preference shocks	σ	0.0008	0.0004
Disutility from labor market participation	ψ	0.0107	0.0025
Husbands' Pareto weight	θ	0.7	0.0155
Auxiliary model parameter	**Symbol**	**Target**	**Simulated**
Effect of uni. divorce on savings in CP	ϕ_1	13.54 percent	13.43 percent
Effect of uni. divorce on participation in CP	ϕ_2	−6.93 pcpt	−6.86 pcpt
Baseline participation rate in CP	ϕ_3	55.97 percent	56.03 percent
Baseline divorce probability in CP	ϕ_4	19.44 percent	19.44 percent

Notes: Parameters of the dynamic model $\{\sigma, \psi, \theta\}$ estimated by indirect inference. The parameters of the auxiliary model are $\{\phi 1\ ,\ \phi 2\ ,\ \phi_3, \phi_4\}$.

Simulation: A

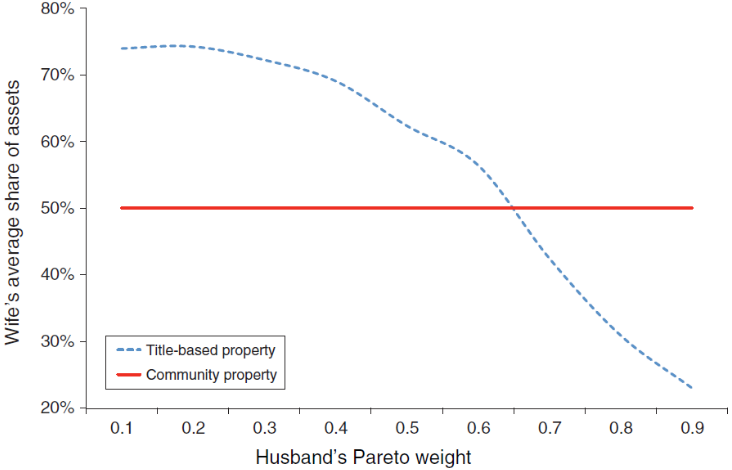
- **Effects from mutual to unilateral**
  in *community* (50-50) regime

Simulation: A

- **Effects from mutual to unilateral**
  in *community* (50-50) regime
- **Mutual:**
  $\theta = 0.7$
  consumption share of women: 39%
- **Unilateral:**
  19% re-bargained their power
  consumption share of women: 41%
  labor supply: $\downarrow$ 6.86pp.

Simulation: B

- **Effects of property division regimes**



Simulation: C

- **Divorce laws and consumption insurance**

TABLE 6—DIVORCE LAWS AND CONSUMPTION INSURANCE AGAINST INCOME SHOCKS

	Married couples			
	Men		Women	
Regimes	Mutual consent	Unilateral divorce	Mutual consent	Unilateral divorce
Title-based	0.372	0.410	0.233	0.207
Community property	0.371	0.390	0.235	0.192
Equitable distribution	0.375	0.384	0.238	0.197

Notes: The table reports the estimates of coefficients μ^j obtained from the regressions

$$\Delta\log(c_{it}^H) = \kappa^H + \mu^H \Delta\log(y_{it}^H) + \boldsymbol{\nu}'^H \mathbf{X}_{it}^j + e_{it}^H \quad \text{and}$$

$$\Delta\log(c_{it}^W) = \kappa^W + \mu^W \Delta\log(y_{it}^W) + \boldsymbol{\nu}'^W \mathbf{X}_{it}^j + e_{it}^W$$

in each legal regime, where X_{it}^j are spouse j's age and age squared. The coefficients are estimated on data obtained from simulating the model using the preset parameters and the estimated parameters for a sample of simulated households. I account for the differential selection of couples out of marriage because of divorce laws by simulating income and consumption profiles using only the policy functions of married couples.

1. Men have more consumption insurance under mutual (lower pass-through of income shocks)
2. Property division does not matter in mutual (col 1 + 3 constant across rows)

Outline

Our simple model

- **Same model as last time** (see notebook)
- We cannot model the same counterfactuals as Alessandra Voena in our simple model.
  But we can **change wealth distribution upon divorce**.

Our simple model

- **Same model as last time** (see notebook)
- We cannot model the same counterfactuals as Alessandra Voena in our simple model.
  But we can **change wealth distribution upon divorce**.
- Now, κ_j denotes the share of wealth to member j, $\kappa_1 + \kappa_2 = 1$.

$$\begin{aligned} V_{j,t}^{m}(a_{t-1}, \psi_t, \mu_{t-1}) = {} & D_t^{\star} V_{j,t}^{m \to s}(\kappa_j a_{t-1}, \psi_t, \mu_{t-1}) \\ & + (1 - D_t^{\star}) V_{j,t}^{m \to m}(a_{t-1}, \psi_t, \mu_{t-1}) \end{aligned}$$

Next Time

- **Next time:**
  Marriage and Divorce (in Denmark).

- **Literature:**
  Bruze, Svarer and Weiss (2015): "The Dynamics of Marriage and Divorce"
  [full commitment]
  - **Read** before lecture
  - **Reading guide:**
    Section 1: Introduction + overview. Read.
    Section 2: Data. Skim.
    Section 3: Marriage patterns. Read (many figures).
    Section 4: Model. Key, get the idea.
    Section 5: Estimation. Skim.
    Section 6: Results. Read.

References I

Becker, G. S. (1981): *A treatise on the family*. Harvard University Press, Cambridge, Massachusetts.

Bruze, G., M. Svarer and Y. Weiss (2015): "The Dynamics of Marriage and Divorce," *Journal of Labor Economics*, 33(1), 123–170.

Voena, A. (2015): "Yours, Mine, and Ours: Do Divorce Laws Affect the Intertemporal Behavior of Married Couples?," *American Economic Review*, 105(8), 2295–2332.