Social Networks and Geographic Mobility

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Low-income workers are comparatively immobile

- Following negative labor demand shocks:
  - Low-skill workers are less likely to out-migrate $\Longrightarrow$ they experience larger declines in nominal and real wages than skilled workers (Notowidigdo 2020)
- Following positive labor demand shocks:
  - Low-skill workers are less likely to in-migrate $\Longrightarrow$ implications for who benefits of productivity growth (Bound and Holzer 2000; Moretti 2011)

Mechanisms explore in the literature:

- Higher mobility/migration costs for low-skill workers (Topel 1986)
- Low-skilled workers may be shielded from negative shocks because of declining house prices and public assistance programs (Notowidigdo 2020)

This paper

What is the role of **local social networks** *on geographic mobility?*

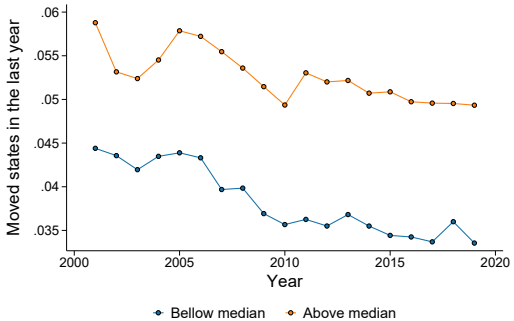
- Social networks as inputs of home production
- In particular: Childcare

Mechanism:

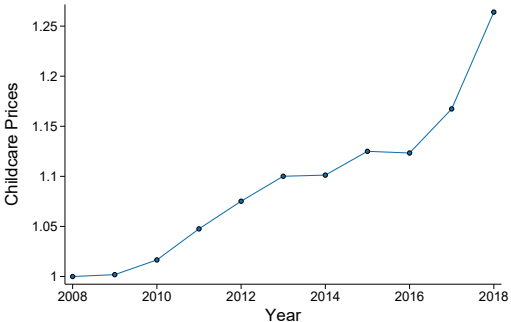
- Households can produce childcare by combining their time, market time, and social network (relatives and friends)
- Lower-income households are priced out of the market and rely more on their social networks

Time trends on mobility and market childcare prices

(a) Geographic mobility of renters



(b) Average Median Childcare Prices



Source: (a) American Community Survey 2001-2019 and (b) National Database of Childcare Prices

What we do + Next steps

1. Document facts on income, mobility, and childcare
   - Preview: Negative correlation between relying on relatives for childcare and mobility
2. Dynamic model of home production and location choice (in progress)
3. Counterfactual we have in mind:
   - *American Families Plan*: free universal and high-quality preschool to all three and four-year-olds
   - How much can this policy improve mobility?

Related literature and contribution

Differences in mobility for low vs high income households:

- Notowidigdo (2020), Bound and Holzer (2000)

Effects of social capital or local ties on mobility:

- Alesina and Giuliano (2010), Blumenstock et al. (2019), Koşar et al. (2022), Zabek (2019)
  - + We explore the role of social capital as an **input** into household production
  - + We are interested in the differential role of this mechanism by households' income

Childcare, proximity to family, and mobility:

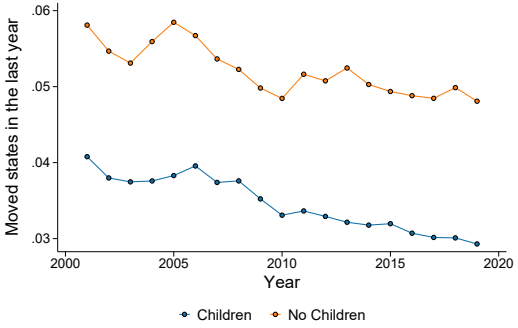
- Garcia-Moran and Kuehn (2017), Anstreicher and Venator (2022)
  - + We want to complement these papers: separate the role of family as an amenity vs as an economic input into household production

Stylized Facts

Decline in geographic mobility: Larger decline for households with kids

- From 2001 to 2019: 28% drop in the mobility rate for HHs with kids, relative to a 17% drop for HHs with no kids.

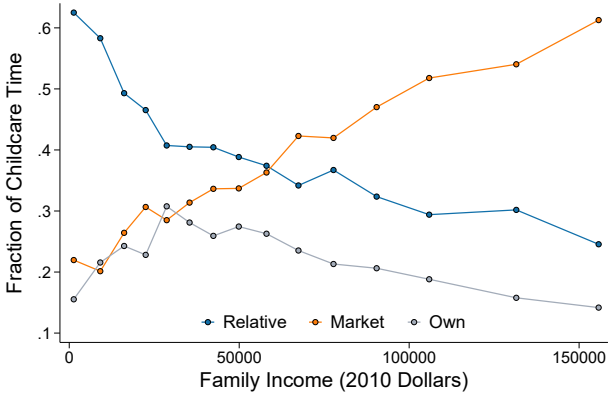
Figure 2: Moved across state lines (renters)



Source: American Community Survey 2001-2019

Lower income households rely more on relatives for childcare

Figure 3: Fraction of Time Using Relatives, Own time, and Market



Source: Survey of Income and Program Participation 2002, 2005, 2010, 2011

Relationship between reliance in relatives and mobility

We run the following regression:

$$Y_{it} = \lambda_t + \beta R_{it} + \gamma X_{it} + \varepsilon_{it} \tag{1}$$

- $Y_{it} = 1$ if household moved to a new state in $t + 1$
- R_{it} is the share of childcare time provided by relatives
- X_{it}: Income, home-ownership, number of kids
- Sample:
  - PSID 1997 and 2014 waves, households with children under 5 years old

Households that rely on relatives are less likely to move across states

	Moved across states	
	(1)	(2)
Relative Share	-0.0331**	-0.0400***
	(-2.14)	(-2.65)
Below Median Income	-0.0217	-0.0418**
	(-0.89)	(-2.50)
Relative Share x Below Median Income	-0.0218	0.0003
	(-0.72)	(0.01)
Positive Total Hours		-0.0115
		(-0.80)
N	1693	2608
Sample Move Rate	.05	.05
Difference in Relative Share Below/Above Median Income	.12	.12

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Model of Location Choice and Childcare Production

Overview

Focus of the model:

- Households decisions of childcare production and mobility
- Prices and wages given and determined outside our model

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Households timing: Households are indexed by i

1. Choose a city $j \in \mathcal{J}$, based on wages, prices, and expected childcare costs
2. Once in city j, choose the set of inputs to produce childcare (extensive margin)
   - **Inputs**: own time t_o, relatives' time t_r, and market time t_m
3. Choose input use (intensive), produce childcare, and consume

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- *In the future*: Externalities in social networks + Amenity value of social networks

Childcare production - Setup

- Childcare production can use three inputs: own time t_o, relatives' time, t_r, and market time t_m.

$$\mathbf{t} = (t_o, t_r, t_m)$$

- Production is CES technology over type inputs:

$$Q_{ij}(\mathbf{t}_{ij}) = \Big(\sum_{k \in s} t_{k,ij}^{\frac{\sigma-1}{\sigma}} \Big)^{\frac{\sigma}{\sigma-1}}, \quad k = \{o, r, m\}$$

- Each input $k \in \{o, r, m\}$ is associated with a variable cost, p_k, and a fixed cost f_k.

$$p_{o,ij} = w_{ij}, \quad p_{m,ij} = f(x_i, x_j), \quad p_{r,ij} = f(\text{tenure}_{ij}, x_i, x_j)$$

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- We define a combination-type s as:

$$s = \Big(\mathbb{1}_o, \mathbb{1}_r, \mathbb{1}_m \Big)$$

Childcare production: Input use & Utility

- Conditional on city j and combination-type s, household i solves the following:

$$\max_{C_{ij},\mathbf{t}_{ij}} \; C_{ij}^{\alpha}\Big(Q_{ij}(\mathbf{t}_{ij}) - \bar{q}\Big)^{1-\alpha}$$

$$\text{s.t. } r_j C_{ij} + \sum_{k\in s} p_{k,ij} t_{k,ij} = w_{ij} - \sum_{k\in s} f_{k,ij}$$

$$Q_{ij}(\mathbf{t}_{ij}) = \Big(\sum_{k\in s} t_{k,ij}^{\frac{\sigma-1}{\sigma}}\Big)^{\frac{\sigma}{\sigma-1}}$$

Childcare production: Choosing combination-types

- From utility maximization, conditional on a and city j and combination-type s:

$$P_{ij}^s \equiv \Big(\sum_{k \in s} p_{k,ij}^{1-\sigma} \Big)^{\frac{1}{1-\sigma}}, \quad t_{k,ij}^s = \Big(\frac{P_{ij}^s}{p_{k,ij}} \Big)^{\sigma} Q_{ij}^s$$

- Then, the indirect utility of choosing combination-type s is:

$$U_{ij}^s = \frac{w_{ij} - f_{ij}(s) - P_{ij}^s \bar{q}}{(r_j)^{\alpha} (P_{ij}^s)^{1-\alpha}}$$

- So households choose combination-type s by solving:

$$\max_{s \in \mathcal{S}} U_{ij}^s \varepsilon_{it}^s$$

- where $\varepsilon \sim$Frechét$(\rho) \implies \pi_{ij}^s = \frac{(U_{ij}^s)^{\rho}}{\sum_m (U_{ij}^m)^{\rho}}$

Dynamic problem

- Households dynamic problem is given by:

$$V_t(x_{it}, \epsilon_{it}) = \max_j \left\{ \mathbb{E}_s[u_t(j, s, x_{it})] + \epsilon_{it}^j + \beta \mathbb{E}[V_{t+1}(x_{it+1}, \epsilon_{it+1}) | j, x_{it}, \epsilon_{it}] \right\}$$

- where

$$x_{it} \equiv (j_{it-1}, \tau_{it-1}, \dots)$$

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- where

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- Our mechanism: Since $\frac{\partial p_{r,ijt}}{\partial \tau_{ijt}} < 0$
  - Households will longer tenure face a lower value of producing childcare, they will only move if the gain is large (compensates the costs)
  - There are dynamic incentives to stay, as staying reduces the cost in the future

Estimation (in progress)

Estimation of the per-period problem

- We parameterize the variable and fixed costs as:

$$p_{k,i} = \begin{cases} w_i & \text{if k=own} \\ \delta_e^k & \text{if k=market} \\ \delta_e^k + \beta_e \mathbb{1}[\tau > 7 \text{ years}] & \text{if k=relatives} \end{cases}$$

$$f_{k,i} = \begin{cases} \gamma_e^k & \text{if k=market, own} \\ \gamma_e^k + \alpha_e \mathbb{1}[\tau > 7 \text{ years}] & \text{if k=relatives} \end{cases}$$

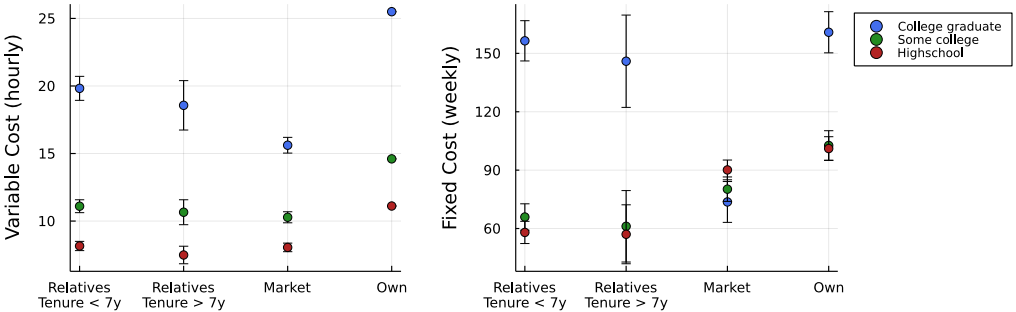
- Estimate the model with maximum log likelihood.

$$\hat{\theta} = \arg\max \sum_i \sum_s \mathbb{1}\{s_i = 1\} \log \pi_i^s(\theta; x_i) \tag{2}$$

  - $\theta = \{\{\delta_e^k\}, \{\beta_e\}, \{\lambda_e^k\}, \{\alpha_e\}, \bar{q}, \sigma, \rho\}$

Preliminary results

Figure 4: Estimated prices and fixed costs



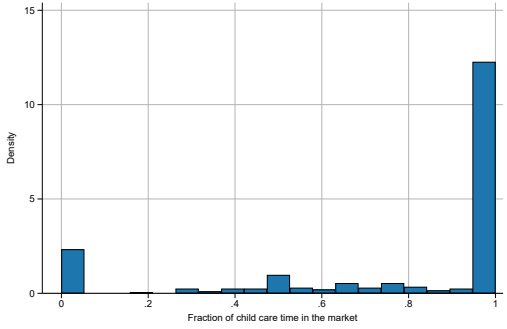
Next steps

- Reduced form:
  - Incorporate the newly available data on childcare prices to the analysis
- Model: Full estimation
  - Incorporate data on the market childcare supply: Prices and availability
  - Include more household characteristics such as race, occupation, etc
  - Estimate migration costs

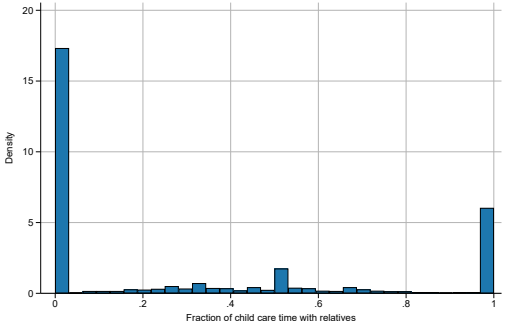
Thank you!

Fraction of childcare time by input

(a) Market



(b) Relatives



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