Matching and credit frictions in the housing market

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Motivation

- Matching friction: It takes time to buy and sell a house. Prices are usually determined via bargaining.
- Credit friction: Some hh's may not be able to finance the house they would like to buy. In addition, face uninsurable income risks.
- How do the two frictions interact?
- We build a model of the housing market that incorporates both frictions.

Relation with previous literature

- We introduce matching frictions following e.g. Wheaton (1990), Albrecht, Anderson, Smith, and Vroman (2007), and Díaz and Jerez (2012).
- Main difference: Add savings/borrowing (from hh's with linear utility to risk averse hh's).
- We embed the matching frictions into a Bewley-Huggett-Aiyagari -framework.
- The approach is similar to that in some recent labor market matching models feature precautionary savings (e.g. Krusell et al. 2010).
- Key difference: two sided heterogeneity.

Preview of the results

- Credit frictions magnify the effect matching frictions and vice versa.
- For instance, a moderate tightening of the borrowing constraint increases price dispersion and average time-on-the-market substantially.
- Because of matching frictions, sellers that would like to sell quickly for liquidity reasons may not be able to sell at all or may have to sell at a relatively low price (making BC more relevant for welfare).
- A tighter BC makes the housing market less liquid.

Key features

- Consumption/savings decisions and idiosyncratic income shocks $\rightarrow$ wealth distribution.
- Each hh either owns or rents a house. Preference shocks (renting vs. owning) generate trade.
- In order to buy/sell a house, hh needs to be matched with a potential seller/buyer.
- Random matching and Nash bargaining.
- The value of buying/selling at a given price depends on the asset position.
- The value of not trading in the current period depends on the entire asset distribution of potential trading partners in the next period.

Tenure choice

- Occupancy state d, renter or owner.
- Tenure preference state $z = 1, 2$.
- Strictly prefer owning to renting $z = 2$.
- Derive the same utility from owning and renting $z = 1$
- Changes with a fixed probability.

- In equilibrium, owner housing is more expensive
- Trade takes place between renters and owners
- Fixed rental rate, v, no frictions there.

Savings and consumption

Given financial savings/borrowing s, financial wealth a evolves as:

$$a' = Rs + \varepsilon' w$$

where ε' is an $i.i.d$ income shock.

Consumption if not trading:

$$c = a - s - g$$

where $g = v$ for renters and $g = \kappa$ for owners.

Consumption if buying or selling with price p:

$$c = a - s - \kappa - (1 + \tau)p$$

$$c = a - s - v + p$$

Hh problem (1/2)

Let $V^d(a, z)$ denote value function before current period matches are determined and $v^d(a, z)$ the value function conditional on not trading.

$$v^d(a, z) = \max_{s \geq \underline{s}^d} \{u(c, z, d) + \beta \sum_{j=1}^{2} P(j, z) \sum_{i=1}^{n_\varepsilon} \varphi_i V^d(Rs + w\varepsilon_i, j)\}$$

subject to $c = a - s - g$

Some hhs are not in the market:

$$V^r(a, 1) = v^r(a, 1)$$

$$V^o(a, 2) = v^o(a, 2)$$

Price determination and the value of a match

- Given a match, there will be trade if there exists a price that makes the surplus from trade positive for both traders.
- The price determined by Nash bargaining.
- Depends on buyer's and seller's asset positions
- The value of a match can be determined given whether there is trade or not and given the associated equilibrium price.

Hh problem (2/2)

Value functions before current period matches:

$$V^r(a,2) = \phi^s \int W^b(a,\widetilde{a}) \frac{\mu^o(\widetilde{a},1)}{m^s} d\widetilde{a} + (1-\phi^s)\, v^r(a,2)$$

$$V^o(a,1) = \phi^b \int W^s(\widetilde{a},a) \frac{\mu^r(\widetilde{a},2)}{m^b} d\widetilde{a} + \left(1-\phi^b\right) v^o(a,1)$$

where W denotes the value of being matched, μ is the financial wealth distribution, ϕ is the probability of meeting a potential trading partner and m is the mass of hh's in the market.

W can be determined using no trade value functions only.

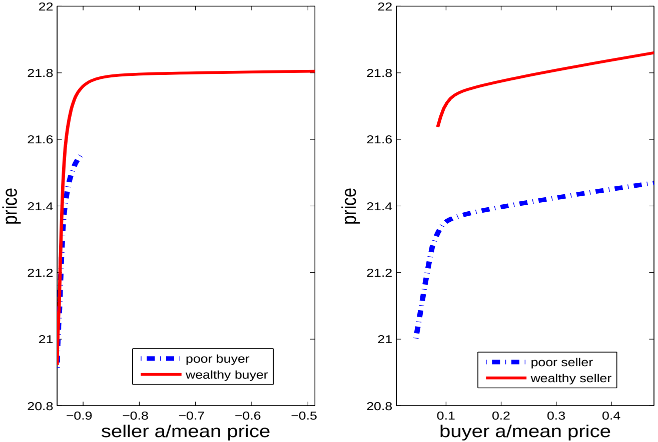
Calibration

- Preferences:

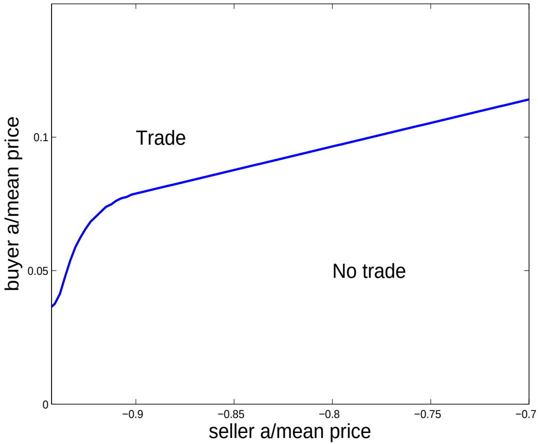
$$u(c, z, d) = \frac{c^{1-\sigma}}{1-\sigma} - I(z, d) f$$

- Model period 3 months.
- Borrowing limit: 95% of the average house value.
- Use Finnish 2004 wealth survey and Finnish transaction data.
- Match i) median rent-to-income (0.27), ii) median house value-to-income (21.8), iii) share of recent byuers with financial wealth-to-house value less than -0.8 equal to 25%, iv) av. time-on-the-market (55 days).

Price functions



Matches that result in trade



Frictions and market outcomes (relative to baseline,%)

	$\bar{a}^o$	$\bar{a}^r$	$\bar{p}$	tom	$cv(p)$	tr
Matching probability						
$\chi = 1.0$	1	2	-1	-73	-25	-2
$\chi = 0.4$	0	-2	1	166	56	4
Borrowing constraint						
0.85	18	8	-6	75	31	-23
0.75	37	17	-11	172	63	-42

A tighter BC $\rightarrow$
1) Although hh's are wealthier, a smaller share of matches leads to trade. TOM goes up.
2) BC is relevant for larger share of hh's. Bargaining outcomes become more sensitive to asset positions. Price dispersion goes up.

Summary

- Credit frictions magnify the effects of matching frictions.
- When a trader is poor in terms of net wealth, the bargaining outcome is sensitive to asset positions. Therefore, tightening the BC increases substantially the price dispersion of identical houses.
- Together with wealth heterogeneity, borrowing constraints also imply that some matches do not lead to trade.
- Average TOM is very sensitive to credit market conditions
- Moderate changes in BC can explain the observed huge fluctuations in the average time-on-the-market.
- New framework combining housing market matching and credit frictions.