Momentum traders in the housing market: survey evidence and a search model

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Motivation

- House price boom in the early 2000s
- What were they thinking?
Motivation

- House price boom in the early 2000s
- What were they thinking?
- How do beliefs affect prices in the housing market?
Housing price-dividend ratio for the United States
Survey evidence

2 phases in the boom:

1. early (2002 & 2003): enthusiasm about housing & credit
   most say "good time to buy a house"
   why? most say "good credit conditions"

2. later (2004 & 2005): disagreement & momentum
   fewer say "good time to buy a house"
   more say "house prices are going up" and "capital appreciation"
Cluster analysis

- a small number of views of the world?

- consider survey responses on housing, growth, inflation, interest rates

- estimate mixture density model

- three clusters emerge: gloomy, good credit conditions, momentum
Price impact

- *standard finance story*: stock market
  
  no short sales but otherwise frictionless

  $\implies$ few wealthy optimists drive up prices by buying up all assets

- *This paper*: housing market?
  
  transaction costs, search, non-standardized asset, indivisible

  $\implies$ standard argument does not apply

  but: recorded price = transaction price

  $\implies$ few (not wealthy) optimists can drive up prices with small increase in volume
Michigan Survey of Consumers (monthly, about 500 respondents)

Q: "Generally speaking, do you think now is a good time or a bad time to buy a house?"

A: "good", "pro-con", "bad", "don’t know"

Q: "Why do you say so?"

A: respondents can give up to two reasons

e.g., good credit conditions ("interest rates are low", interest rates won’t get any lower", "credit is easy to get"), good investment ("house prices are going up", "capital appreciation"), current prices are low, high quality of the houses on the market
Michigan Survey of Consumers

good time to buy
Michigan Survey of Consumers

good time to buy

housing price-dividend ratio
Michigan Survey of Consumers

- **Good Time to Buy**
  - 1985: 13
  - 1990: 14
  - 1995: 15
  - 2000: 16
  - 2005: 17

- **Housing Price-Dividend Ratio**
  - 1985: 10
  - 1990: 11
  - 1995: 12
  - 2000: 13
  - 2005: 14

The charts show the trends in consumer sentiment and housing price-dividend ratio from 1985 to 2005.
Summary of stylized facts

2 phases in the boom:

1. early (2002 & 2003): enthusiasm about housing & credit

   85% most say "good time to buy a house"

   peaks earlier than house prices, enthusiasm not particularly high

   why? 73% say "good credit"

   which is always main reason for overall view of housing

2. later (2004 & 2005): disagreement & momentum

   fewer say "good time to buy a house", 60% in 2006

   20% say "house prices are going up" and "capital appreciation"

   peaks with house prices, momentum at an all time high
Cluster analysis

- clusters characterize "views about the world"
  housing, future business conditions, inflation & interest rates,

- statistical mixture model
  within each cluster, survey responses to individual questions are independent
  same probabilities within each cluster, different between clusters
  mixture probability measures size of each cluster

- probability that household $n$ answers question $i$ in cluster $c$: "good/higher" $\mu_{i,1}(c)$, "same/no mention" $\mu_{i,2}(c)$, "bad/lower" $1 - \mu_{i,1}(c) - \mu_{i,2}(c)$

- likelihood of answers in the survey
  $$L = \prod_{n=1}^{N} \omega_n \sum_{c=1}^{C} p(c) \prod_{i=1}^{I} \mu_{i,1}(c)^{a_{i,1}^n} \mu_{i,2}(c)^{a_{i,2}^n} \left(1 - \mu_{i,1}(c) - \mu_{i,2}(c)\right)^{a_{i,3}^n}$$
  mixture probabilities $p(c)$, $I=6$, $C$ varies, $\omega_n$ survey weight
Cluster analysis ctd.

late boom phase (2004, 2005)

<table>
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<th>cluster 1</th>
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<td>0.0069, 0.012</td>
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summary – three clusters:

1. gloomy
   - (relatively) low growth, high inflation
   - bad time to buy a house
     credit conditions bad, prices too high and likely to fall

2. good credit conditions
   - good time to buy a house because good credit and low prices
   - more optimistic on growth, inflation

3. momentum
   - good time to buy because prices will raise
   - views on growth, inflation similar to 2, but higher expected interest rates
### Observable characteristics

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Average characteristics of households who justified their view that now is a good time to buy (Michigan Survey of Consumers, variable HOM) with “house prices are going up”, “house prices won’t get lower” or there will be “capital appreciation” (variables HOMRN1, HOMRN2) during the housing boom years 2004 and 2005, and those households who did not. Averages based on survey weights.

- observable characteristics are significant in multinominal logit, with zero $R^2$
Search model of the housing market

setup

- continuous time

- measure 1 of infinitely lived households

- quasilinear utility in numeraire consumption and housing consumption, discount future at $r$

- indivisible housing units, fixed supply $h < 1$

- one house max per person

- preference shock: homeowner initially "happy" (gets services $v$ from house) turns "unhappy" ($v=0$) with some probability (Poisson process with arrival rate $\eta$)
actions

- homeowners (happy $\mu_H$ or unhappy $\mu_U$): put house on the market? (costly!)
- renters $\mu_R$: search for house?

matching

- matching function $M(\mu_B, \mu_S) = m\mu_B^\alpha \mu_S^{1-\alpha}$, sellers make take-it-or-leave-it offers

equilibrium

- optimal actions
- number of home owners = fixed supply of houses = $h < 1$
Search model of the housing market ctd.

**steady state**

- only unhappy owners put house on market $\mu_S = \mu_U$, renters search $\mu_B = \mu_R = 1 - h$

- housing price-dividend ratio

$$ P = \frac{v}{r} - \frac{\eta}{r + \eta + m} \frac{v + c}{r} $$

  discount vanishes as matching gets faster ($m \to \infty$)

- pick parameters so that

  6% houses traded per year, 3% inventory outstanding, 16 price-dividend ratio, cost incurred during sale 10% of house value

  $\implies$ roughly 3% renters
Search model of the housing market ctd.

experiment

- make renters optimistic

  believe that house is worth price-dividend ratio of 19 (rather than 16)

once matched, they become happy owners
Search model of the housing market ctd.

- bottom line: small number of optimistic households can have large price impact, even if each only buys one house and trading volume increases modestly
  
  [frictionless (stock) market: need wealthy optimistic households who buy up all the assets, high volume]

- key feature: high share of optimistic buyers in transactions, not high market share!

- average price = transaction price goes up in a market with few transactions
Conclusion

- Stylized facts:
  
in the late phase of the boom,
  a historically large fraction of households expected further house price increases

- Cluster analysis
  
  three main views: good credit conditions, high future prices & gloomy outlook

- Model:
  
  small number of optimists drive average prices in a search market, because average price reflects few transactions