Discussion of Carlos Garriga's Paper "The Role of Construction in the Housing Boom and Bust in Spain"

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The Question

- What explains the Spanish Housing Boom?
  Between 1995 and 2007
  Real House Prices rose by **121%** (U.S. OFHEO 80%; CS 120%; Census 45%)
  Real Residential Investment rose by **100%** (U.S. 11%; but 68% by 2005)
  Real GDP rose by **57%** (U.S.:45%)
- The candidates:
  Population
  Interest rates
  Technology

Carlos' Housing Model

$$u = \sum_{t=0}^{\infty} 0.91^t \left(0.84 \log c_t + 0.16 j_t \log s_t\right)$$

constraints

$$\begin{aligned} c_t &= A_{ct} N_{ct} && [p_{ct}] \\ H_t &= A_{ht} N_{ht} + (1-\delta) H_{t-1} && [p_{ct}\, p_{ht}] \\ s_t &= H_t^{0.67} L^{0.33} && [p_{ct}\, p_{st}] \\ N_{ct} + N_{ht} &= N_t^w \end{aligned}$$

p_{ht} : price of structure
p_{st} : price of housing services (rent)
L : fixed supply of land
j_t, A_{ct}, A_{ht} : shocks

Model equilibrium conditions

$$
\begin{aligned}
c_t &= A_{ct} N_{ct} \\
H_t &= A_{ht} N_{ht} + (1-\delta) H_{t-1} \\
s_t &= H_t^{1-\alpha} L^{\alpha} \\
N_{ct} + N_{ht} &= N_t^w
\end{aligned}
$$

$$
\begin{aligned}
\frac{\gamma}{c_t} &= p_{ct} \\
\frac{j_t (1-\gamma)}{s_t} &= p_{ct} p_{st} \\
p_{ht} p_{ct} &= \alpha \frac{p_{st} s_t}{H_t} p_{ct} + \beta p_{ht+1} (1-\delta) p_{ct+1} \\
A_{ct} &= p_{ht} A_{ht}
\end{aligned}
$$

8 equations in 8 unknowns $(c, H, s, N_c, N_h, p_c, p_s, p_h)$, a computer can solve this model in less than a second

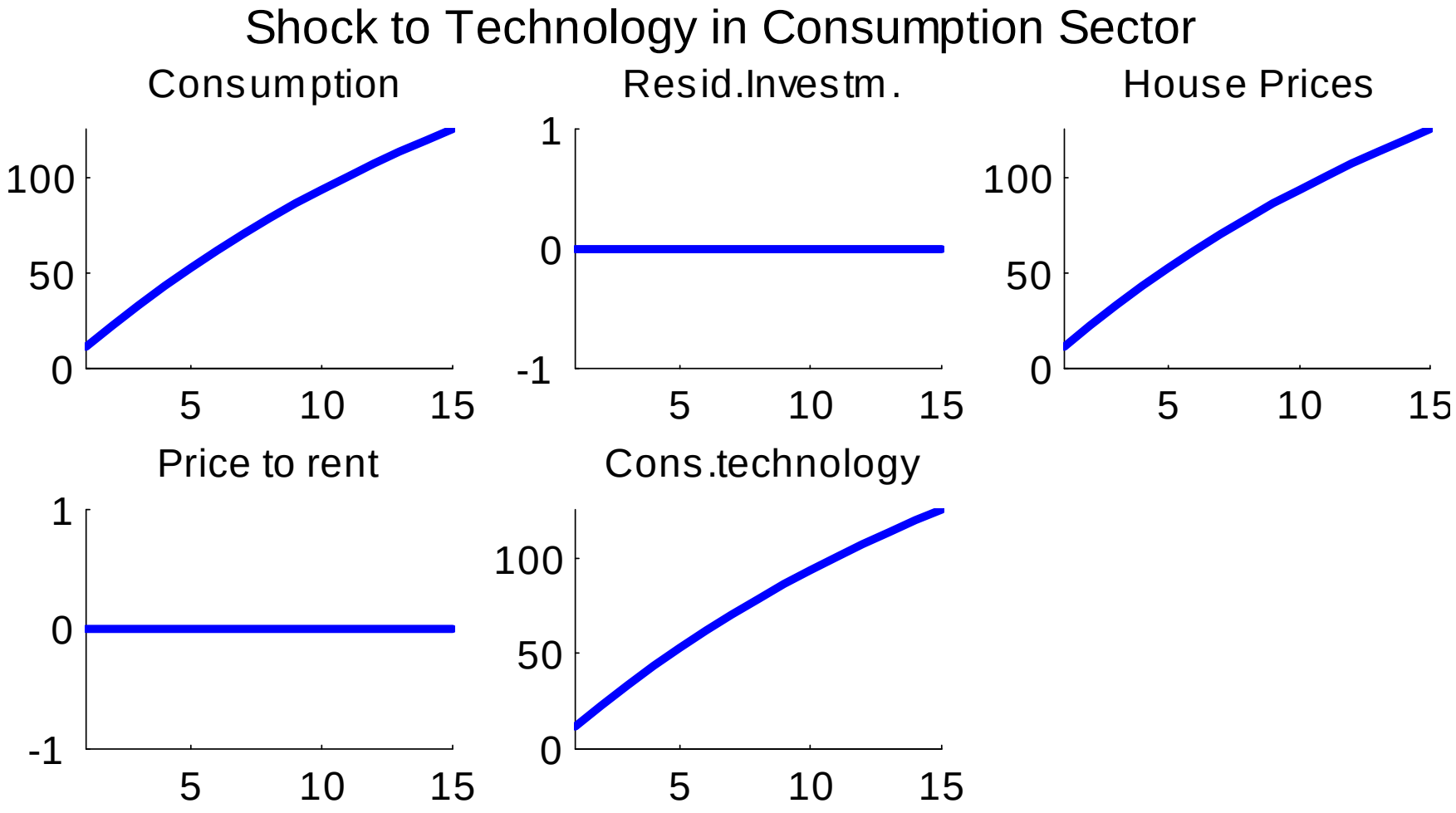
$$q_t = p_{st} + \frac{q_{t+1}}{R_t} \text{ (to compute house prices)}$$

What I will do

- I will consider three shocks in this model
  A_c, N^w, j_t
- Unlike Carlos, I will modify the shocks so that population, technology and preferences change gradually. (Model should fit not just endpoints, should also look at transition)
- My claim: In such a model, the mysterious preference shock best makes sense of what happened in Spain. Population won't work. Interest rates might, but the timing of the interest rate decline should be more carefully modeled

1: Technology shock in the Consumption Sector

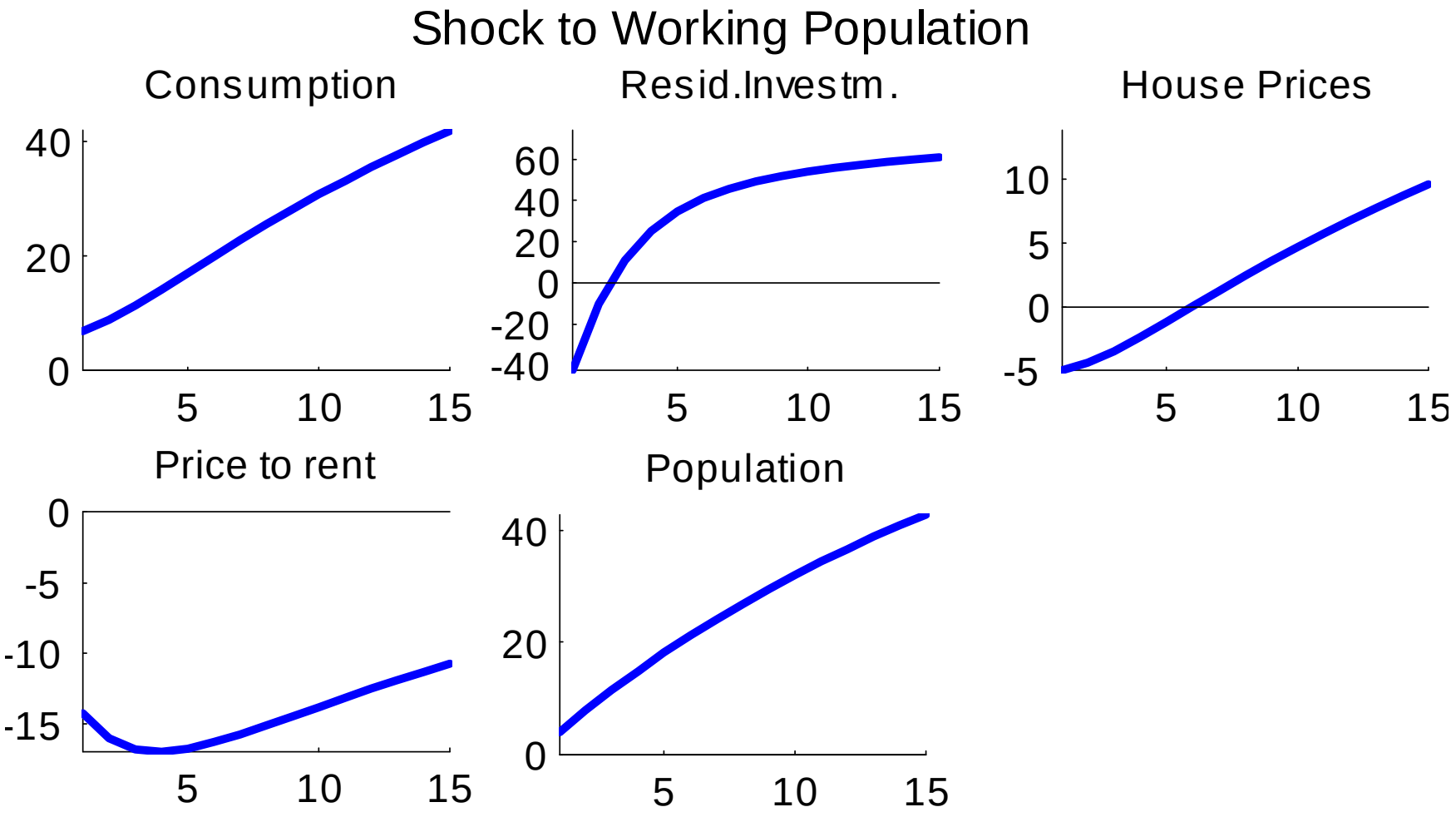
SIZE: HOUSE PRICES TO RISE BY 121% AFTER 15 YEARS
Leads to a rise in house prices
But no change in housing investment
With CD preferences, expenditure shares remain constant (inconsistent with Spain)
House prices rise, but rents rise as much as prices, so this might be another problem.

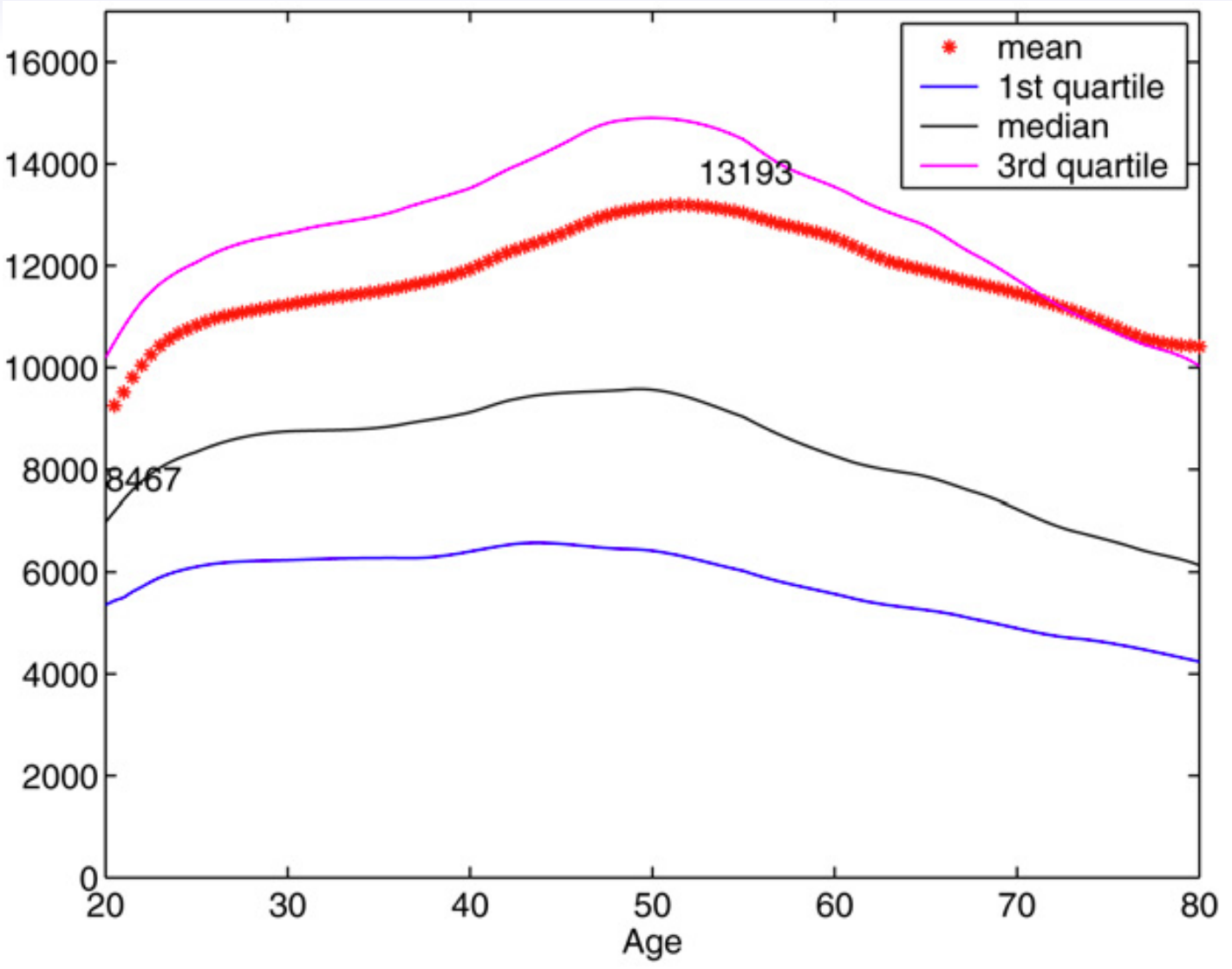

Shock to Technology in Consumption Sector
Consumption
Resid.Investm.
House Prices
Price to rent
Cons.technology
100
50
0
1
0
-1
5
10
15

2: A Working Population Shock

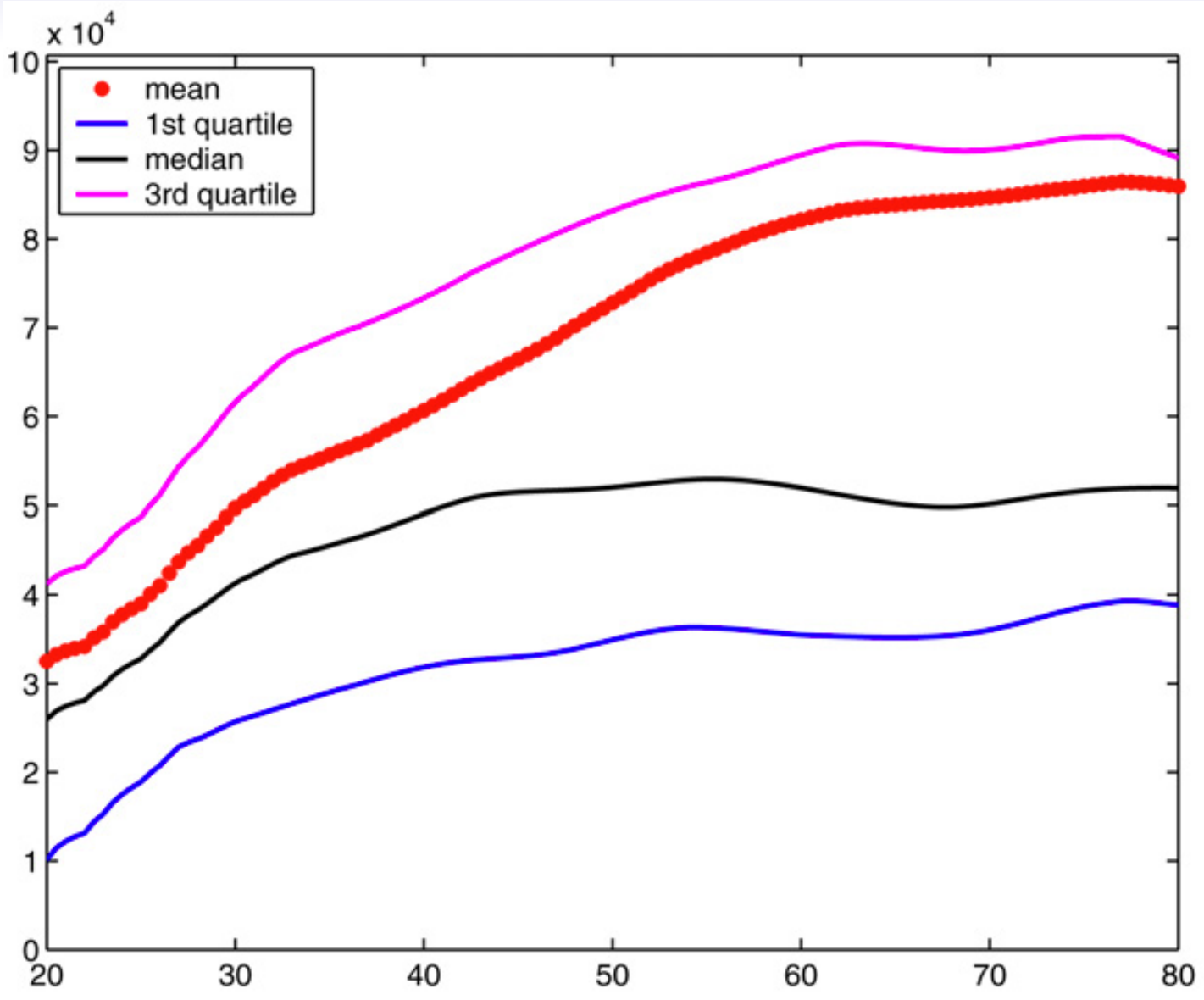
SIZE: WORKING POPULATION TO RISE BY 37%
Can create a short-run boom in investment
Not if the population shock is gradual
But I don't see how it can explain the massive increase in the price and quantity of housing that Carlos claims (in the new steady state, should consumption and housing wealth both rise by 37%)?
Counterfactual for price-rent ratio (consumption smoothing, real rates rise, price fall relative to rents

An overlooked fact: more people buy more houses but also more food. Often forgotten. If anything, old people (who do not work) consume more housing relative to consumption (see e.g. Yang, RED 2009, Figures 2 and 4)


Shock to Working Population
Consumption
Resid.Investm.
House Prices
Price to rent
Population
40
20
0
60
40
20
0
-20
-40
10
5
0
-5
-10
-15
5
10
15



Owner's NON-HOUSING CONSUMPTION

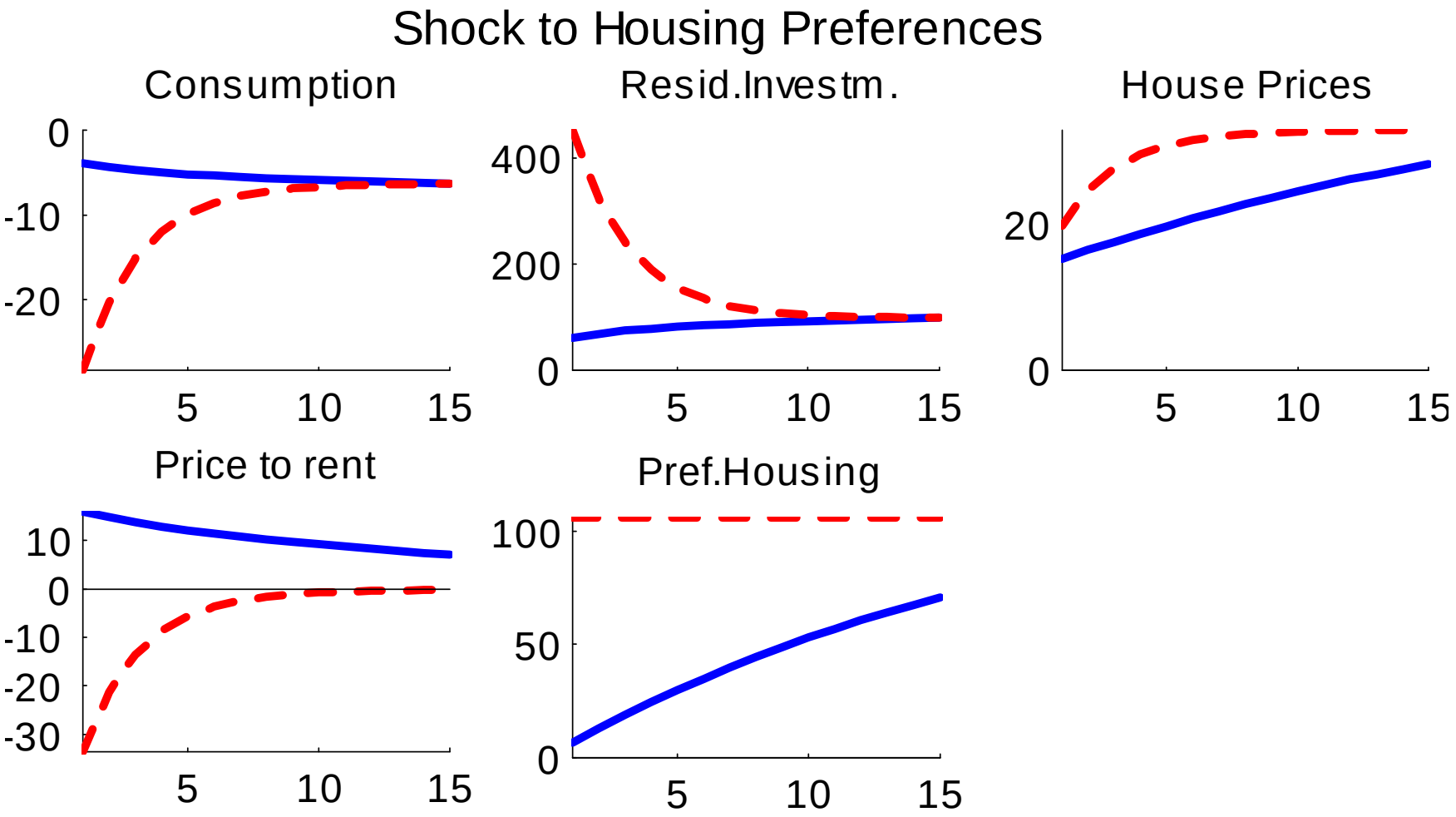


Owner's HOUSING CONSUMPTION

3: A Shift in Preferences towards Housing

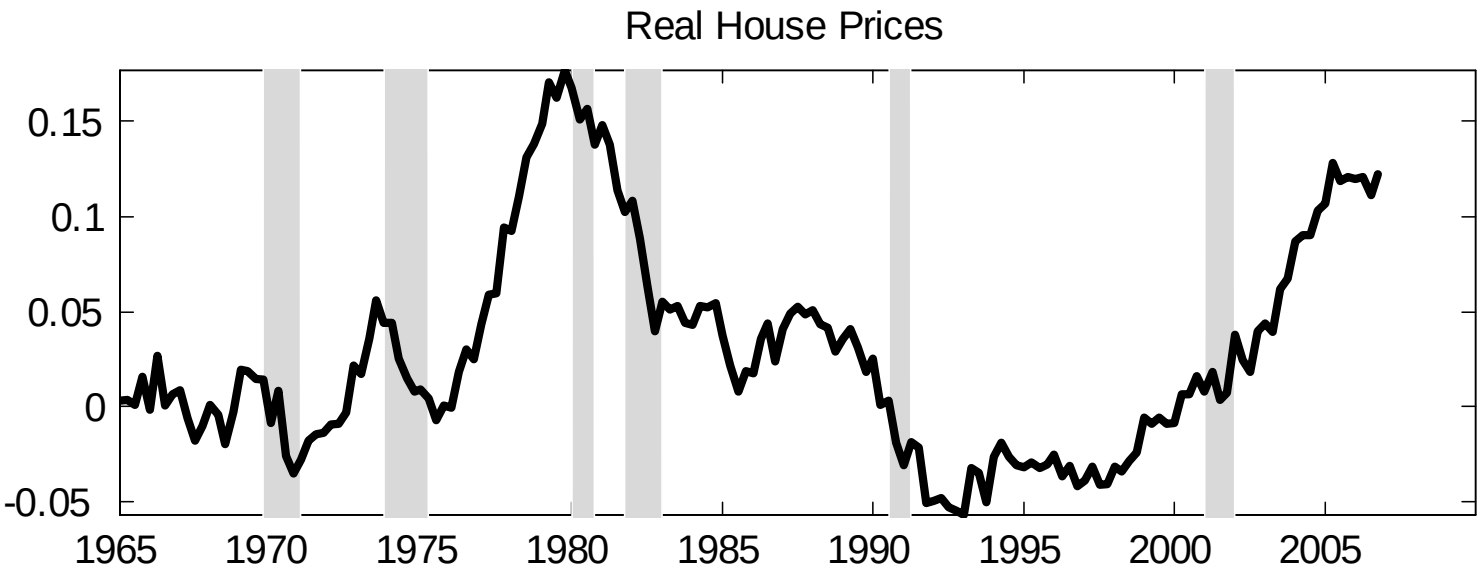
Consequence of social and psychological factors
SIZE: HOUSING INVESTMENT TO RISE BY 100%
Can create a boom in investment and house prices, and a big change in the ratio of housing wealth to consumption.

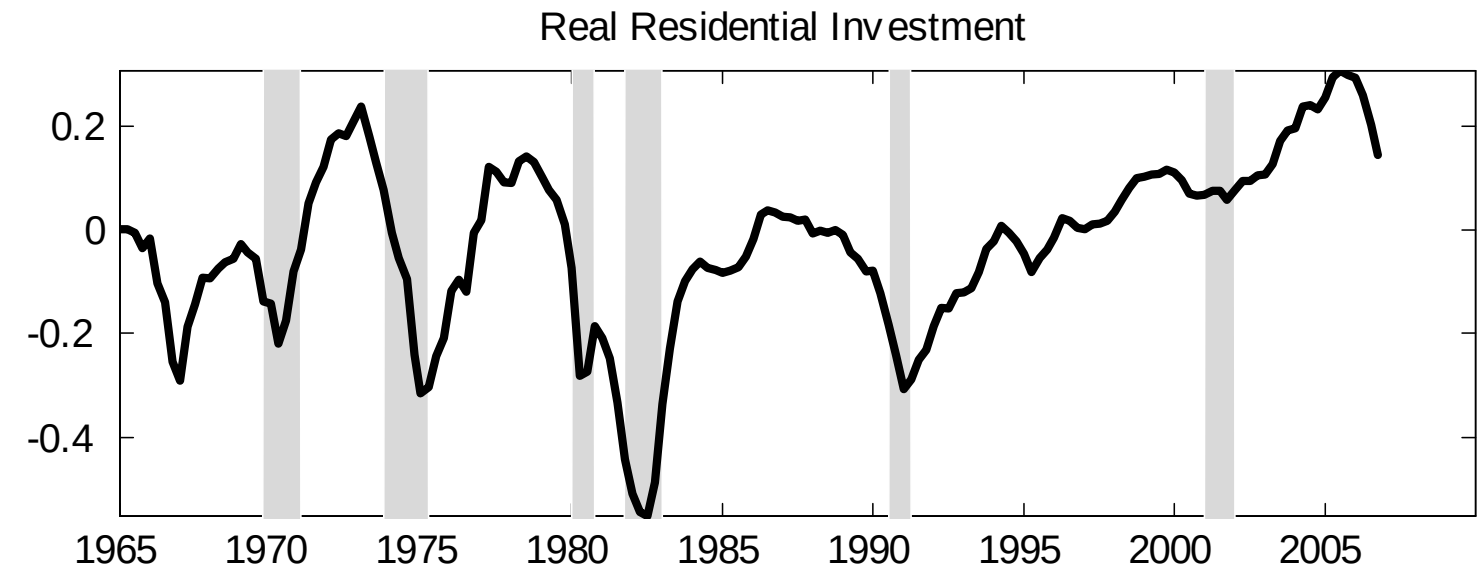
- Yeah, yeah, maybe captures something else, but this something else is not a simple, easily identifiable factor.

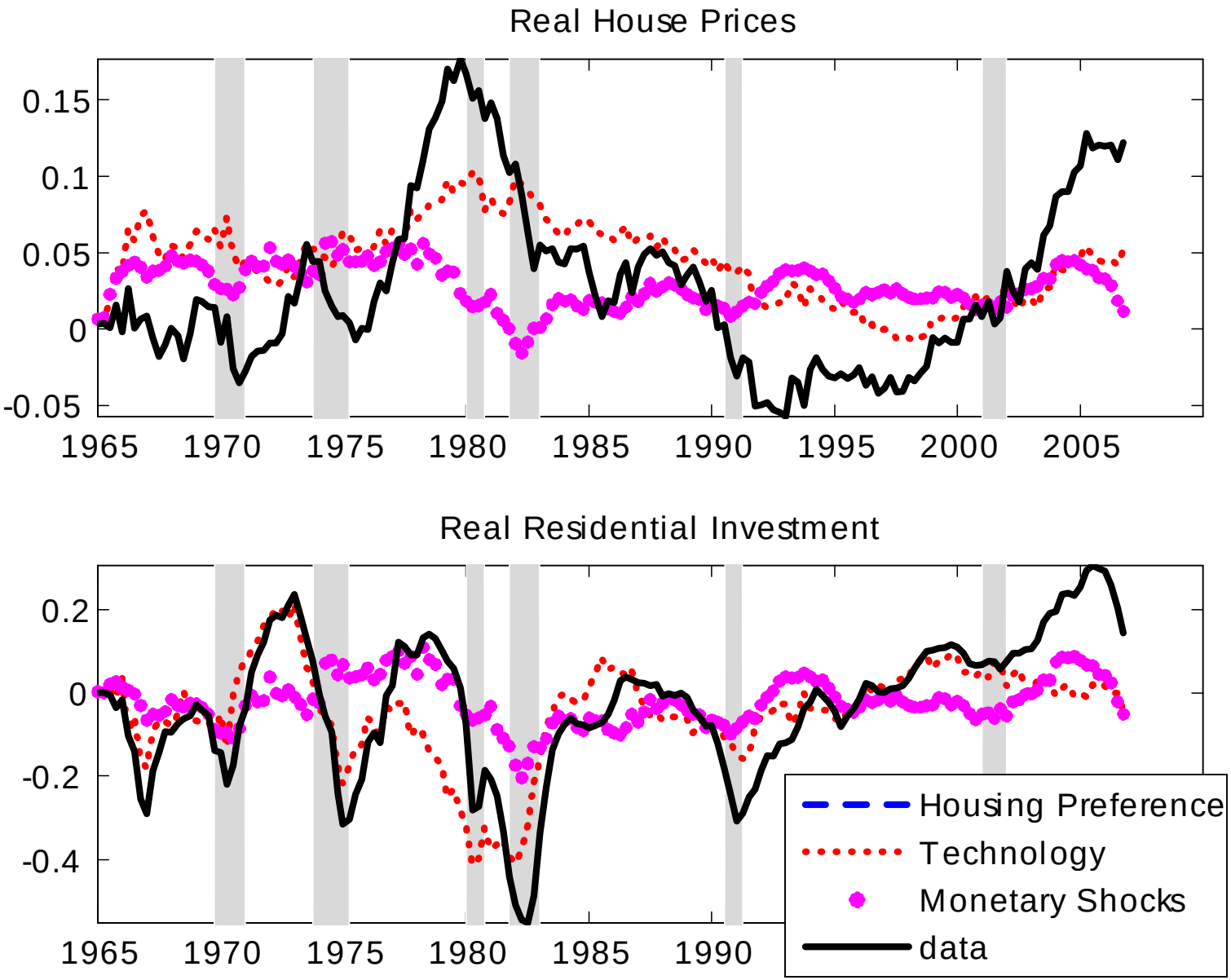

Shock to Housing Preferences
Consumption
0
-10
-20
5
10
15
Resid.Investm.
400
200
0
5
10
15
House Prices
20
0
5
10
15
Price to rent
10
0
-10
-20
-30
5
10
15
Pref.Housing
100
50
0
5
10
15

1 minute of shameless self-promotion.....

Based on Iacoviello and Neri, 2010: DSGE Model of the Housing Market with nominal and real rigidities where technology, preferences, inflation and monetary policy are candidates in explaining housing and other macro variables; estimated with Bayesian methods.


Real House Prices
0.15
0.1
0.05
0
-0.05
1965
1970
1975
1980
1985
1990
1995
2000
2005


Real Residential Investment
0.2
0
-0.2
-0.4
1965
1970
1975
1980
1985
1990
1995
2000
2005


Real House Prices
0.15
0.1
0.05
0
-0.05
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1975
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Real Residential Investment
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1965
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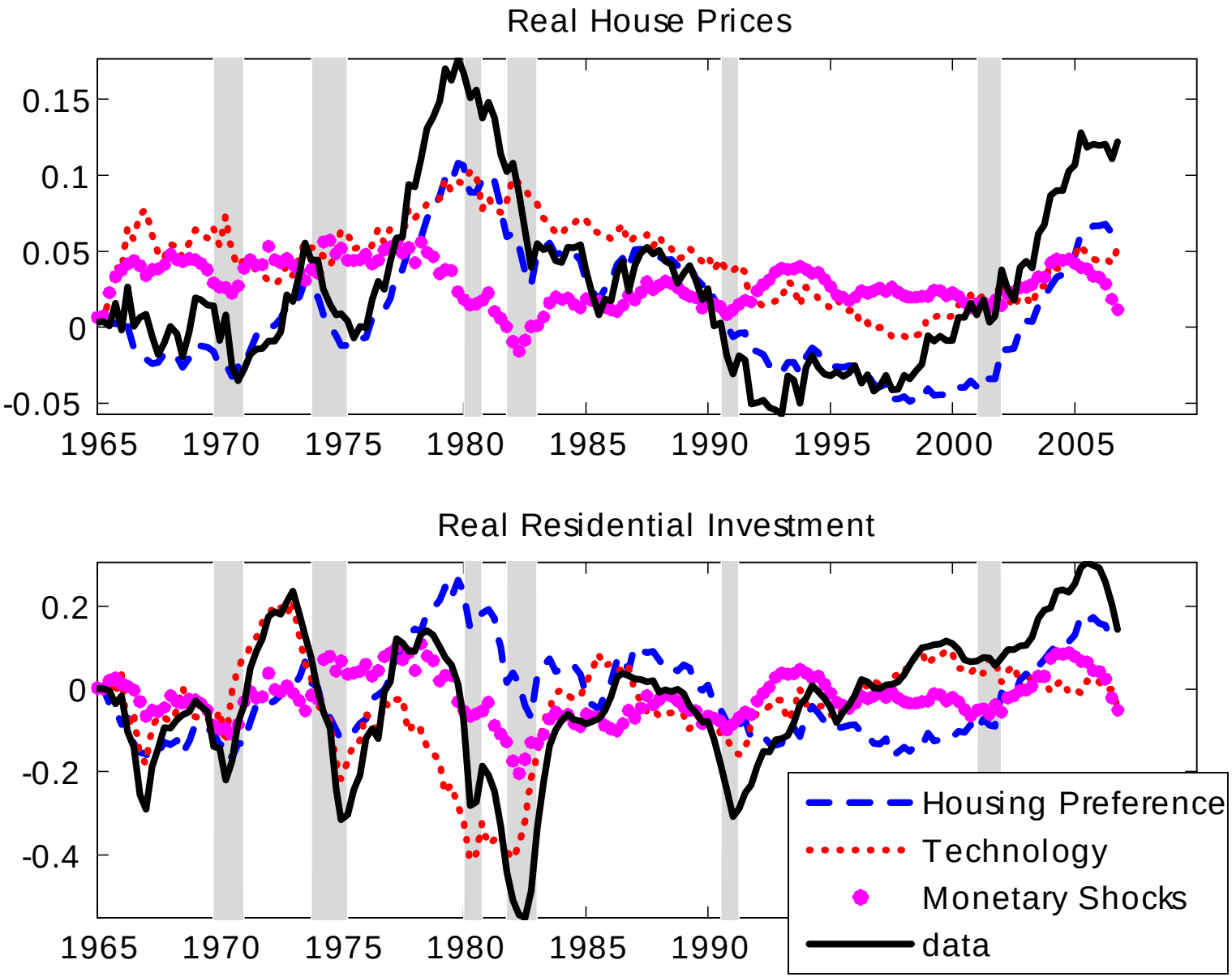
1980
1985
1990
Housing Preference
Technology
Monetary Shocks
data


Real House Prices
0.15
0.1
0.05
0
-0.05
1965
1970
1975
1980
1985
1990
1995
2000
2005
Real Residential Investment
0.2
0
-0.2
-0.4
1965
1970
1975
1980
1985
1990
Housing Preference
Technology
Monetary Shocks
data

Evidence for preference shocks

- "Privacy is another important factor for the buyer in today's market. With the increasing pressures of crowded living, more and more people are searching for solitude" [1970]
- "People have been buying a lot more house than necessary... They've had empty living rooms with plastic covers on the furniture while they were using the family room..." [1975]
- "Another show of wealth is a trend for buyers to raze expensive houses to build newer, even more expensive houses more to their taste" [1998]
- "Housing strength also reflects surprisingly resilient consumer confidence. Memories have faded away of the early 1990s... Faith in real estate as an investment remains strong" (2001).
  (source: real estate or business section of NYT)

Some Reminders

- Single-bullet explanations of housing boom and bust are good for story-telling, they do not work well in dynamic equilibrium models
- I am not aware of any model where subprime or interest rates or population can explain why housing wealth doubles in less than 10 years