

Housing and Heterogeneity: A Narrative and An Agenda

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Alternate History? ('History 2.0')

From 1998 We Had 2030 Tools:

***Panel* data at the household level:**

- Integrated HH balance sheets
 - Registry, or Mint.com (<https://mint.com>)-type
- *With*
 - Expectations ('What will stock/housing prices do?')
 - Explanations ('Why?')
 - Uncertainty, Perceived Constraints ... whatever models say matters

Models that can handle:

Heterogeneity in expectations *and explanations*

- Many competing theories right now
 - Fading Memory
 - Diagnostic Expectations
 - k-Level Thinking

Winner Will Have Two Features

1. Expectations are extrapolative

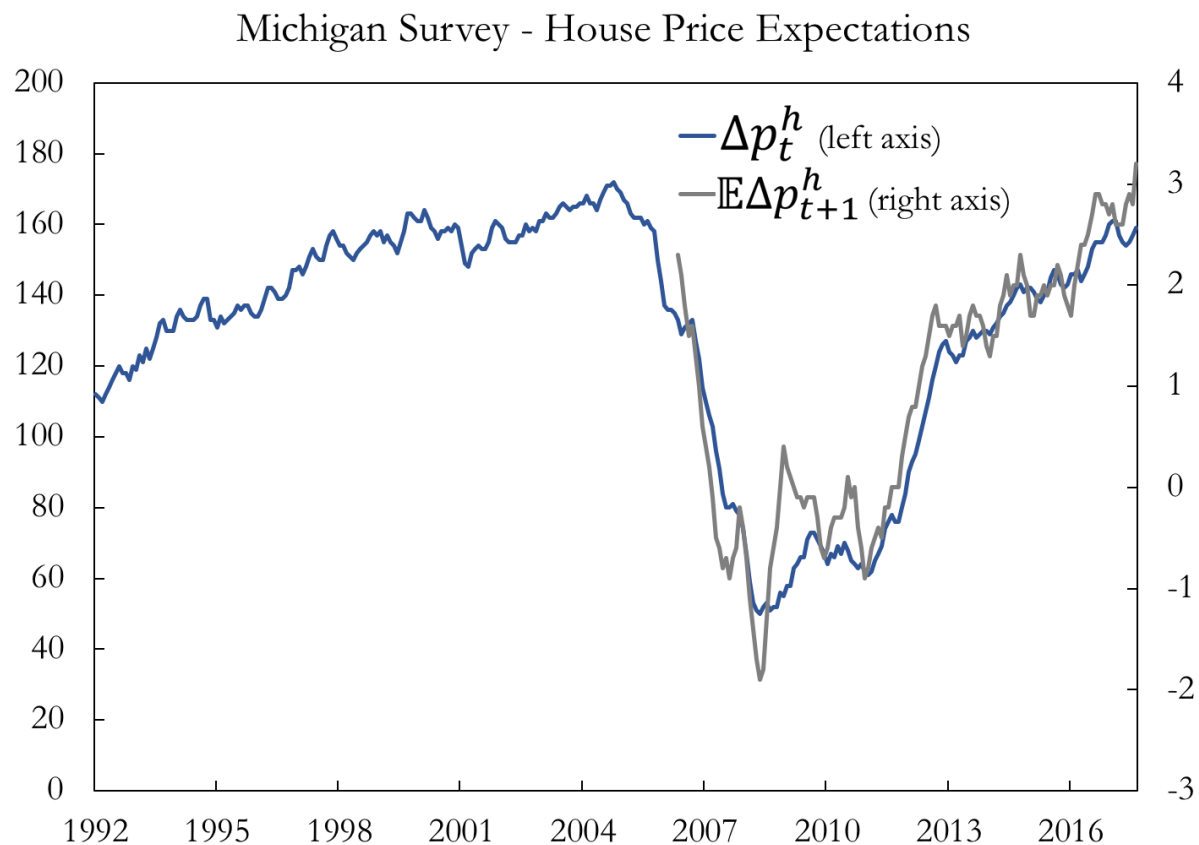
- *Perception of*

$$\Delta p_t \Rightarrow \mathbb{E}_t[\Delta p_{t+1}]$$

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- *Perception of*
 $\Delta p_t \Rightarrow E_t[\Delta p_{t+1}]$



Winner Will Have Two Features

1. Heterogeneity in the interval used for extrapolation
 - Shiller looks back 150 years
 - A lot of people right now don't remember events from 10 years ago

Combination of "Diagnostic Expectations" and heterogeneous "Fading Memory"?

... Toy 2030 Theory: Anatomy Of Bubbles

1. Some genuine good news arrives
 - Fundamental value of asset is higher

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1. Spread of extrapolative $E[\Delta p]$ is like a disease

- Susceptible to infection:
 - People with access to funds ...
 - ... and short 'memory'
 - ... who are optimists
 - "Infection": *marginal* people buy

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1. Collapse of bubble is like "recovery" from infection

- Recovered: Behavior of "marginal" people back to normal

Prehistory

Mid-90's Productivity Acceleration

- Greenspan's "New Economy" (~1996)
- Becomes Consensus:
 - Economic Report of the President (2001).
(http://www.presidency.ucsb.edu/economic_reports/2001.pdf).

Prehistory

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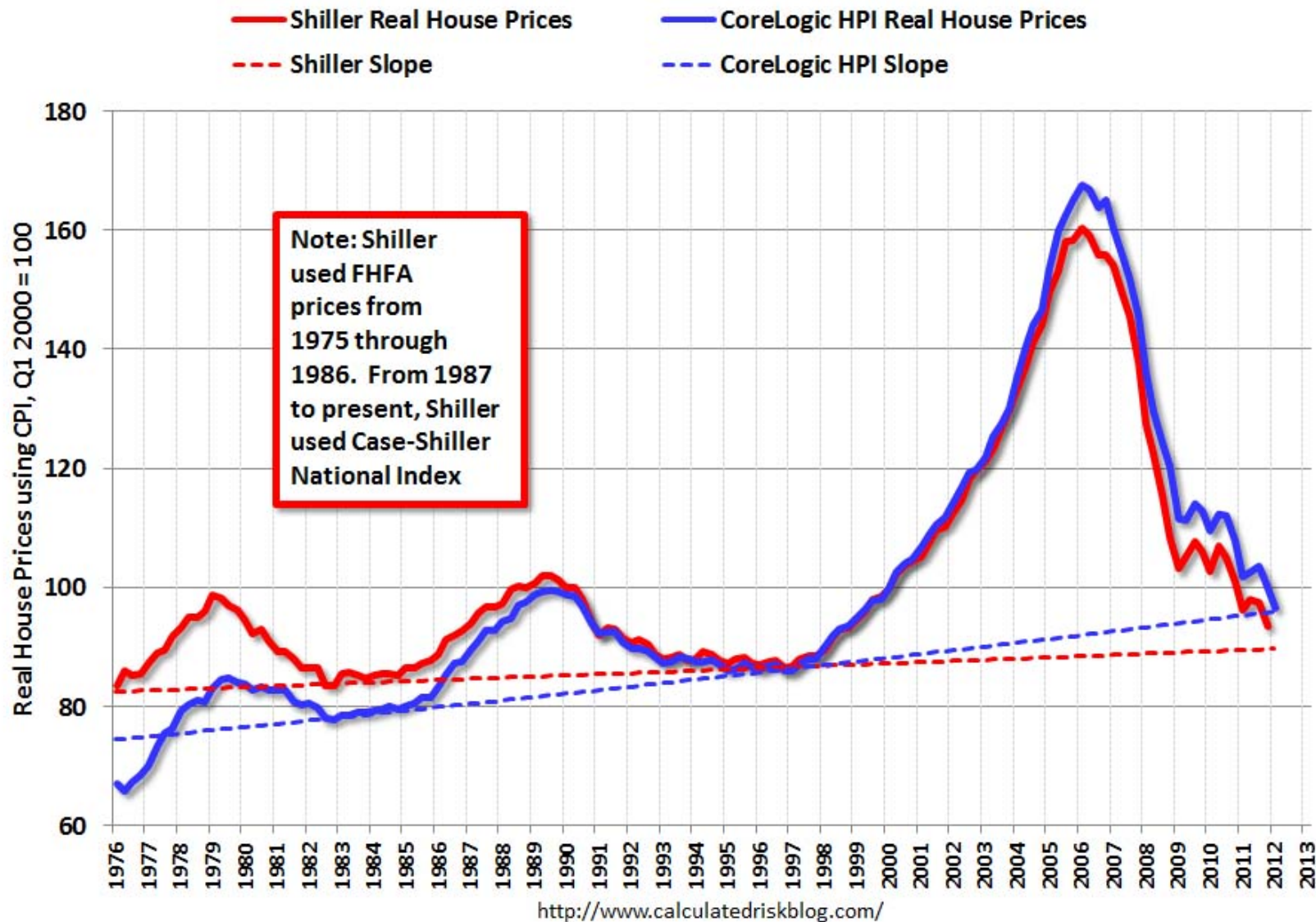
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⇒ Boom in asset prices

- Stock Market (1994-2000)
- Also big ↑ in house prices (~1997-2002)

Housing Prices Started Rising: ~1997

Real House Prices



The Boom: History 1.0 - Facts

2000-01: Contra , housing was *not* the cycle

- Barely a blip in house prices or construction

2001-05: Chinese external saving unleashed

- "global savings glut ('GSG')"
- \Rightarrow Interest rates lowest since Great Depression

2002-06: Continuing \uparrow in availability of credit across the board

- Subprime *and* prime
- For primary residences *and* nonprimary

The Boom: History 1.0 - Contemporaneous Views

- First prominent claims housing bubble is inflating?
 -
 -
- "That Hissing Sound"
- 'Financial innovation'
 - 'Something funny going on around here'
- Popular culture
 - "Flip That House" first episode: July 2005

The Boom: History 1.0 - Contemporaneous Views

"It is *Not* A Bubble"

- 2005 JEP
Paper

Instead, It's Improved Fundamentals

- "New Economy", Low R, 'financial innovation'

The Boom: History 2.0 (2002-2006)

- **2030 Theory:** Improved fundamentals are *prereq* for a bubble
 - Not an argument against a bubble
 - Bubble: $p^h \uparrow$ from fundamental sets off spiral:
 1. Marginal buying by extrapolative optimists
 $\mathbb{E}_{i,t}[\Delta p_{t+1}^h]$
 - Not buying, e.g., because of R
 2. ... and consequent $\Delta p_t^h \uparrow$ "infects" more:
 $\mathbb{E}_{j,t+1}[\Delta p_{t+2}^h]$
 3. Bursts when these *marginal* people depart

The Boom: History 2.0 (2002-2006)

- **2030 Data:** Lots of people in "susceptible" (=marginal) pool in 2002-03
 1. Beneficiaries of 'financial innovation' (Mian and Sufi)
 2. "New Economy" beliefs + Bush tax cuts ...
 - Some people with money to invest ...
 - ... are pessimistic about stock market (after dot-com bubble)
 - ... but optimistic about house prices (extrapolating)

History 2.0 (2003-2006): Infection Spreading

- **2030 Data:** Let us see expectations and options changing *heterogenously*
 - Among *marginal* buyers, we see \uparrow in $\mathbb{E}_{i,t}[\Delta p_{t+1}]$
 - We ask them why \uparrow in $\mathbb{E}_{i,t}[\Delta p_{t+1}]$
 - They say, basically, "momentum"
 - and the marginal buyers say *they are buying*:
 - *because* $\mathbb{E}_{i,t}[\Delta p_{t+1}^h]$

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 - "You know it's a bubble" when
 - 1920s: Shoeshine boys give stock tips (Joe Kennedy)
 - 2000s: 'Flip That House': Hairdressers, bartenders become flippers

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2030 Data *are* the plural of anecdotes.

Boom to Bust (2007-2008): History 1.0

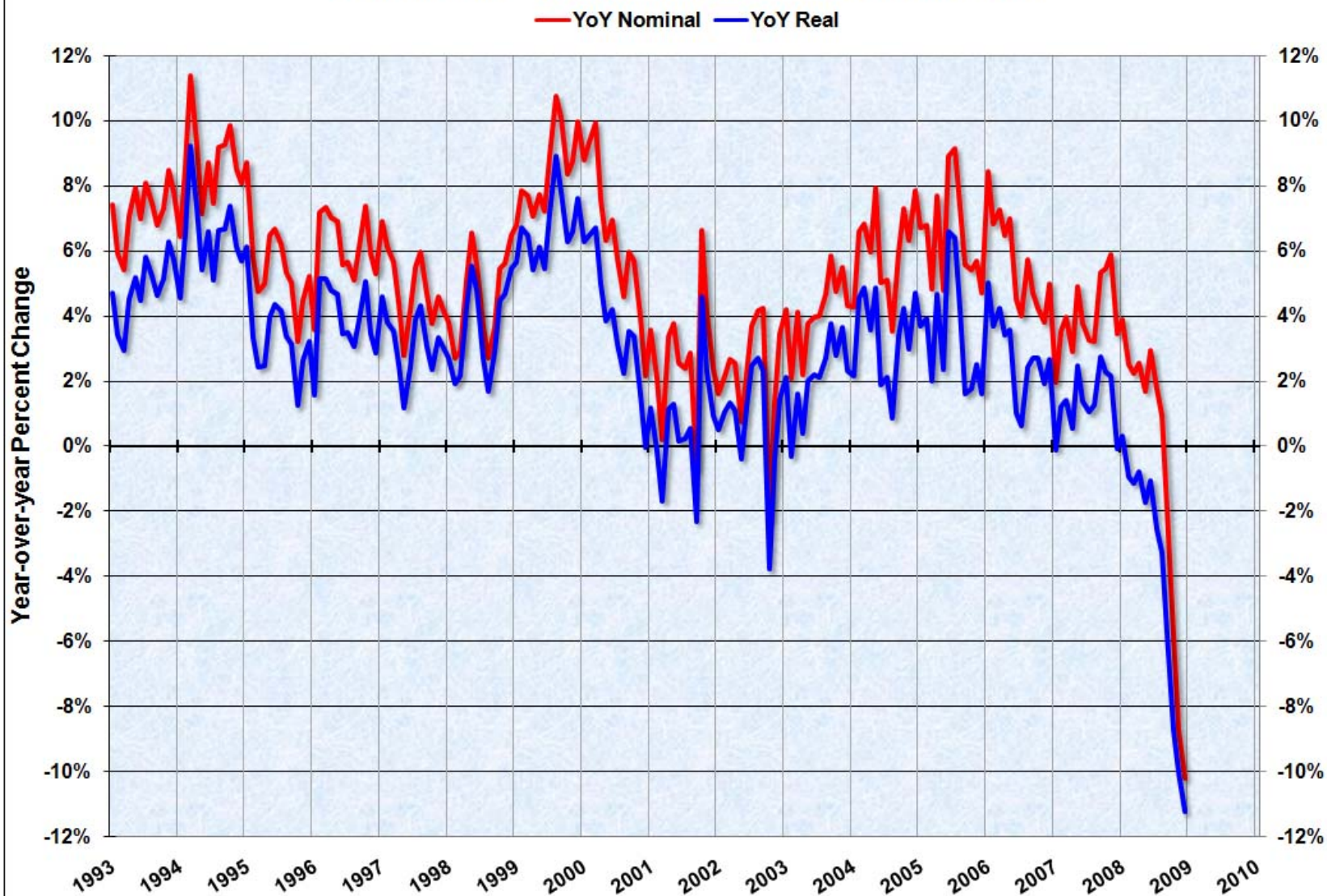
Competing Interpretations of Great Recession

1. Huge negative shock to credit supply
 - Eggertson and Krugman, Guerrieri and Lorenzoni, Aruoba et al
2. Huge increase in uncertainty
 - Bloom, many others

Boom to Bust: History 2.0 (2007-08)

- In 2006-07, *expansion* of credit stops
 - *Low memory marginal types* extrapolate quickly:
 - Low memory optimists become pessimists
 - $\Delta p_{2007}^h < \mathbb{E}_{2006}[\Delta p_{2007}^h]$
 - $\Rightarrow \mathbb{E}_{2007}[\Delta p_{2008}^h] < \mathbb{E}_{2006}[\Delta p_{2008}^h]$
 - Hissing sound gets loud
 - Explains slowdown 2006-2008q2
 - My Guess: Does *not* explain collapse between 2008q2-2008q4

Year over Year Change in Retail Sales, Source: Census Bureau



Boom to Bust: History 2.0 (2008q2-2008q4)

2030 Data

- Consumption collapsed even:
 - For people who are never going to want to borrow
 - More for people whose expectations deteriorated more
 - In regions where there had not been a boom

2030 Theory

- Degree of uncertainty is a "fundamental"
 - We see huge increase in uncertainty
 - Those whose uncertainty increased more, cut C more

The Boom: History 2.0 (2002-2006, Macropru edition)

- Macropru regulators know how to do *micro* 'stress tests' <!-- * Prudence:
 $\mathbb{E}[u']$
 - At date t , see dist'n of balance sheets *and* $\mathbb{E}_t[\Delta p_{t+1}^h]$
 - Can see unusual participation by *marginal* types -->
 - **2030 Theory:** We know what circs cause defaults
 - Can simulate defaults under alternate *future* histories:
 - Productivity growth, interest rates, uncertainty
 - ,
- By 2006, micro stress tests reveal major fragility to minor shocks

The Boom: History 2.0 (2002-2006, Macropru edition)

Which Macropru policies do what?

- **2030 Theory+Data:** People default when
 - Underwater + Negative income shock ('double trigger')

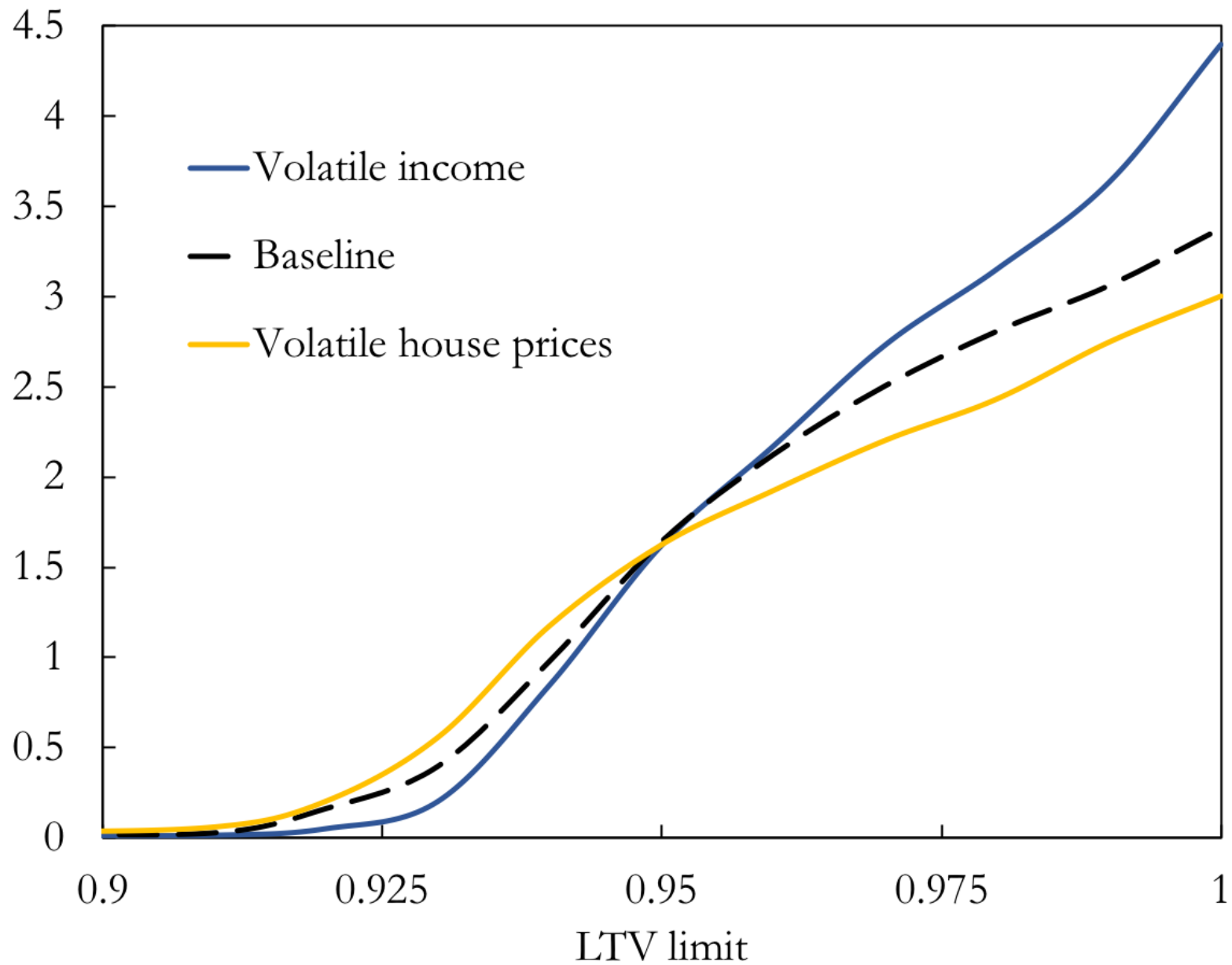
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- **2030 Theory+Data:** People default when
 - Underwater + Negative income shock ('double trigger')
- **2030 Theory**
 - : Theory that matches 'double trigger' facts implies
 - Debt-To-Value rules insulate against income shocks
 - Payment-To-Income rules insulate against p^h shocks
 - Calibrated stress tests tell you which to adjust

Khan (2018): Macropuru Effectiveness Vs Shock Kinds

Default Rate



The Boom: History 2.0 (2002-2006, Macropru edition)

New kinds of macropru rules

- Countercyclical rules that target "speculative" demand. Examples:
 - Risk-weighted capital rules where "riskiness" rises with
 - Proportion of aggregate lending for non-primary-residence
 - Proportion of buyers who say they are buying because $\mathbb{E}[p^h]$ high

The Boom: History 2.0 (2002-2006, Macropuru edition)

Consequence? History 2.0 differs from 1.0

- Size of bubble is smaller
- For a given bubble size, consequences are milder

Part 2: Agenda

Modeling (near term priorities)

Incorporate real estate investing in HH problem

- Integrated with "primary housing" choices
- Governed by same expectations, explanations
- In *model* eqbm, consumers face choice between:
 - Stock market
 - Real estate

New focus of models (and analysis thereof):

- *Tell us what to do on surveys*
- e.g., Kaplan, Mitman, Violante would imply:
 - Ask expectations, explanations
 - Are explanations about fundamentals or extrapolative?
 - 'I think R is permanently lower'? or
 - 'Prices have been going up'
 - *Whose* expectations to focus on
 - Target surveys to people making marginal decisions

Dynamics (not just steady states)

- *Especially* for the marginal players
- Sluggishness in p^h *and behavior* comes from:
 - Search frictions
 - Information frictions
 - Everybody knows everything instantly: won't work
- Very hard

Modeling Expectations and Explanations (Desiderata)

- Ideally, same deep model for *Everybody*
 - Difference in deep parameter like "memory"
 - Most diffs in behavior explained by circs
- Behavioral foundations strongly disciplined by evidence
 - "Other people are like me"
 - "Representativeness Heuristic"
 - Fading Memory
 - ...

Deep Improvements in Modeling Practice

Need a DYNARE for HA modeling

- ECB can run Riksbank model calibrated to Italy
- Riksbank can run Fed model calibrated to Sweden

Feasible with modern collaborative software development tools:

- Modular
- Open-source
- Robust
reproducibility

Getting There?

- Institutional support of infrastructure development
 - Like DYNARE has had
 - As is done in other scientific/technical fields
 - Astronomy, Artificial Intelligence, Bayesian Statistics, Biology, ...
(<https://www.scipy.org/topical-software.html>).
- Changes in professional equilibria
 - "Publication"
 - Referees need to be able to run your code
 - Readers need to be able to reproduce your results
- Beginning: Econ-ARK (<http://econ-ark.org>), project

Abolish Consumer Expenditure Surveys

Replace them with Consumer *Expectations* Surveys

- Get expenditures from admin data (Mint.com, registries)
- Use precious survey time asking:
 - expectations
 - explanations: 'Did you buy that second house because \uparrow in $\mathbb{E}_i[\Delta p^h]$?'
 - *whatever else models say is important*
- Oversample potential *marginal* decisionmakers
 - e.g. intensive focus on new homebuyers
 - 'Are you a flipper?' (and a hairdresser?)

Conclusion

- Might take more than 12 years
- We'll get there!

References