

Models of Beliefs

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Conventional agenda

- quantitative rational expectations models
 - ▶ study recurring patterns, e.g. business cycles
 - ▶ agents solve dynamic optimization problems with expectations consistent with equilibrium dynamics of the model
- success:
 - ▶ match distribution of equilibrium prices and quantities
- advantages
 - ▶ provides discipline if no data on expectations available
- disadvantages
 - ▶ less useful for unique episodes, structural change:
2 national housing booms in U.S.: Great Inflation, financial innovation
 - ▶ excess vol puzzle - model beliefs do not capture uncertainty of investors

Big data collection efforts

- Many new surveys of households and firms
 - ▶ Panel on Household Finances (PHF) by Bundesbank since 2011
 - ▶ European Community Household Panel by ECB and member national banks since 2003
 - ▶ Survey of Consumer Expectations by New York Fed since 2013
 - ▶ Survey of Household Economics and Decision making by the Federal Reserve Board since 2013
 - ▶ Canadian Survey of Consumer Expectations since 2015
- Many surveys involve researchers directly
 - ▶ Online Survey of Consumer Expectations by Bundesbank in 2019
 - ▶ Ifo Business Tendency Survey
 - ▶ Atlanta Fed Survey of Business Uncertainty since 2015
 - ▶ Vanguard
- Progress on how to ask questions, match with actual choices

Patterns in survey data

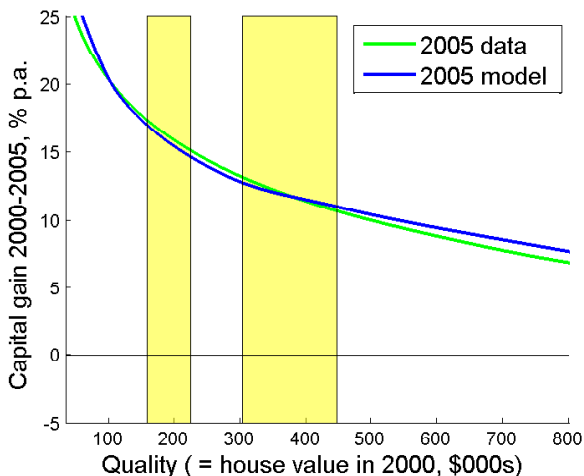
- Conventional agenda
 - ▶ rational expectations conform to predictability regressions:
return expectations are **low in booms**
 - ▶ why do investors buy in booms? low risk aversion or low risk
- Survey evidence challenges the conventional agenda
 - ▶ return expectations are **high in booms**
 - ▶ housing: Case & Shiller 2003, Piazzesi & Schneider 2008
 - ▶ bonds: Piazzesi, Salomao & Schneider 2015
 - ▶ stocks: Greenwood & Shleifer 2014, Myers & de la O 2018 (cash flows!)
- Current state of AP
 - ▶ spend 20 min of seminar to dismiss survey data, could mean anything
- Future AP
 - ▶ ask whether rational expectations can match survey data

How to use survey beliefs in models?

- temporary equilibrium by Hicks 1939, 1965, Grandmont 1977
 - ▶ heterogeneous agents solve dynamic optimization problems given some expectations (may be functions of time t variables)
 - ▶ determine demand for goods and assets at time t
 - ▶ solve for market clearing prices and allocations at time t
- discipline assumptions on expectations with survey forecasts
- deals with unique episodes, reflected in survey answers
- success: match equilibrium prices and quantities
- example: Landvoigt, Piazzesi & Schneider 2015
credit conditions and expectations jointly drive high house prices in 2005

Cross section helps identification

Distribution of equilibrium capital gains on houses from 2000 to 2005



Belief heterogeneity

- Some patterns have natural explanations
 - ▶ information cheaper to obtain, more accurate expectations
e.g. Germany: renters have higher rent, price forecasts than owners
Le Blanc, Kindermann, Piazzesi & Schneider 2019
- Agenda to explain household behavior with income, wealth, age
 - ▶ example: high R2s for home ownership rates
- Low R2s for beliefs
 - ▶ More humble approach: not clear how people get their expectations
Landvoigt 2017, Lenel 2018, Giglio, Maggiori, Stroebel & Utkus 2019
 - ▶ Describe clusters of people, Piazzesi & Schneider 2008
 - ▶ How do clusters evolve? Volume!