Speculation and regional house price dynamics:

Evidence from a natural experiment

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Understanding when and where house bubble (or large swings in the house market) may occur are central to both household decision making and the development of efficient housing policy. Models based only on fundamentals, however, have troubles to fit regional house price volatilities (e.g., Glaeser, and Gyourko, 2006). Thus researchers have increasingly turned to examining the role of speculation as an additional factor in explaining the huge house pricing volatility in certain markets (e.g. Chinco and Mayer ,2016; Choi, Hong, and Scheinkman, 2013).

It is challenging to determine causality between investor purchases and excess house price volatility, due to the following two reasons. First, identifying speculators in the data is difficult because house buyers may change their intentions when the market conditions change. Researchers have tried many ways to address this issue. For example, Chinco and Mayer (2016) use out-of-town second house buyers to proxy for speculators in their study. Choi, Hong, and Scheinkman (2013) show that owner occupants likely over-invested in home improvements to speculate. Second, exogenous variations in the supply of speculators are hard to find. Speculation usually becomes active when the investment opportunity in real estate market is promising, so it is hard to avoid reverse causality issue. That is, investors might have purchased in high-appreciation-rate markets because they anticipated that booming house prices would present profitable opportunities. Alternatively, the presence of speculators might have driven prices up higher than would have happened had only owner-occupants participated in the market.

Even if we can identify the impact of speculation on house prices, we have trouble explaining the mechanism through which speculation affects house prices. For example, Shiller has long argued that investors and consumers in housing and other financial markets are subject to irrational exuberance and unrealistic expectations of future price appreciation (e.g., see Ackerloff and Shiller 2009). Shiller (2007) points to speculative feedback and social contagions as key factors in the recent global rise in house prices. One problem in examining the theory of irrational exuberance/social contagion is that it does not help predict where and when bubbles occur. For example, why did bubbles seem to occur in some markets in the United States but not in others? Why were housing bubbles so widespread in many parts of Europe (e.g., United Kingdom, Ireland, Spain) but not in Germany?

To answer these questions, this paper exploits a staggered, large scale policy change in China to quantify the impact of speculation on regional house price volatility. Starting from 2011, more than forty Chinese cities have imposed

restrictions on buying real estate for speculation purpose. For example, Beijing banned the sale of homes to those who have not lived in the city for five years. It also limited the number of homes a native Beijing family could own to two, and allowed only one home for non-native Beijing families. Not only did cities impose restrictions in different months or years, but they eased these restrictions over time. Thus this policy change offers a unique opportunity to identify the causal impact of speculation on house price volatilities.

In addition to its enormous cross-city variation of house purchase restriction in the past six years, two features of Chinese house market make it well-suited for our research purpose. First, all the restricted cities have neighbor cities which don't impose purchase restrictions. The fact that the restricted cities and unrestricted cites stood side by side at the time that the restriction policy is imposed or eased offers a tight temporal and geographic framework for assessing the impact of speculation on house price volatilities.

Using a difference-in-differences method, I find that the increase in the house price volatilities in the unrestricted cities (before and after the purchase restriction policy) is significantly larger than that in the matched restricted cities over the same period. This finding suggests that speculation increases house price volatility. I also use the ease of purchase restriction policy and examine the spin over effect as robustness check.

A second empirical virtue of Chinese house market is that there is substantial variation of economic conditions across Chinese cities, which allows me to examine different mechanisms through which speculation can affect house volatility. After imposing house purchase restrictions, the change of house price volatilities will be heterogeneous across cities, depending on how different economics conditions amplify the effect of speculation. By exploiting this heterogeneity, I can examine different hypotheses. For example: during the recent U.S. housing cycle in the 2000s, some areas such as Las Vegas and Phoenix experienced more dramatic housing price booms and busts, despite their relatively elastic housing supply, compared to areas with more inelastic supply, such as New York and Los Angeles (Glaeser,2013). It would be interesting to see how cities with different house supply react to the purchase restriction policy and why.

In addition to house supply, there are three other mechanisms that can amplify speculation: Irrational expectation of households (e.g., see Ackerloff & Shiller 2009), illiquidity of housing (Piazzesi and Schneider, 2009), and credit expansion（Favara, and Imbs, 2015）. The next step for our project is to collect household-level transaction data from internet (webcrawling from on-line house posts of the biggest Chinese real estate agent) to construct proxies for household expectation, illiquidity of housing, and house supply, and use bank branching data to construct proxies for credit availability. Then we will explore how these factors interact with the house purchase restrictions and eventually affect house price volatiles.

Reference

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Glaeser, E.L., 2013. 1. Title: A Nation of Gamblers: Real Estate Speculation and American History. *The American Economic Review*, *103*(3).

Budget

- Data acquisition
  - Three Research assistants: 800 dollars/ month, 4 months, 9600 dollars.
  - External data storage mobile disk: 2T, 800 dollars
- Travel expense:
  - Domestic conference presentation: 3000 dollars

Total: 13,400 dollars

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PROFESSIONAL EXPERIENCE

Visiting Research Professor	**Stern School of Business**	**New York University**	**2015-present**
Assistant Professor	**School of Economics**	**Fudan University, China**	**2011-present**
Instructor	**Krannert School of Management**	**Purdue University, IN**	**2007,2009**
Research Assistant	**Dynamic System Group**	**Max Plank Institute, Germany**	**2005**
Research Assistant	**Optimization Department**	**Fraunhofer Institute, Germany**	**2003-2005**

Causes Taught:

- Graduate Level: Big Data in Finance , Risk Management in Banking Industry, Finance I, Microeconomic II, Mergers and Acquisitions, The Theory of Corporate Finance
- Undergraduate Level: Principles of Macroeconomics
- Teaching Awards:
  - Best Teacher of the Year, School of Economics, Fudan University 2012
  - Outstanding Teaching Award, Krannert School of Management, Purdue University, 2009

EDUCATION

PhD	**Economics**	**Purdue University, IN**	**2005-2010**
Visiting Student	**Finance**	**the University of Chicago, IL**	**2007-2008**
Master	**Applied Mathematics**	**the University of Kaiserslautern, Germany**	**2003-2005**
Bachelor (with distinction)	**Management Science**	**Beijing Normal University, China**	**1999-2003**

RESEARCH INTERESTS

Empirical Corporate Finance, Banking, Entrepreneurship and Real Estate Finance

Industry Experience and Government Projects

- Co-investigator of research grant from the **Ministry of Science and Technology of China**, RMB 390,000. Title: *Investigation in Scientific Parks in China* 2015-2016
- Principle Investigator of research grant from the **National Science Foundation of China**, RMB 220,000. Title: *Trust Repair: Experimental Approaches* 2014-2016
- Principle Investigator of research grant from the **Social Science Project of Fudan University** (2012SHKXQN001) , RMB 100,000. Title: *The micro-foundation of real estate bubble in China* 2013-2015
- Principle Investigator of research grant from the **Shanghai Pujiang Talent Plan Project**, RMB 100,000. Title: *Studies on Entrepreneurs' Incentives* 2011-2013
- Principle Investigator of research grant from the **Young Scholar Social Science Foundation of Ministry of Education of China**, RMB 70,000. Title: *The Impact of Information Disclosure on Top Managers' Incentives* 2011-2014
- Principle Investigator of research grant from the **Purdue Research Funds**, USD 18,000. Title: *Endogenous Equity Market Non-Participation: The Effects of Human Capital Investment* 2008-2009

WORKING PAPERS

International Relations and Cross-border Mergers and Acquisitions (with Shu Lin, Kose John) under review
Interstate banking, bank information and corporate acquisitions (with Kose John, Jing Wang) under review
Just talk ? CEO succession plan disclosure,Corporate Governance and Firm Value (with John McConnell)
How stable are corporate debt structures? (with Jing Wang) under review
International Banking Integration and Real Sector Integration: A Perspective from the Crossborder Firm Mergers and Acquisitions (with Julan Du, Chang Li, Chih-Sheng Hsieh)
How Does the Director's Social Network Matter? Evidence from Structural Estimation

PRESENTATIONS AND INVITED TALKS

American Economic Association	Chicago 2017
Corporate Governance Research Luncheon,	Stern, NYU 2015,2016
Financial Management Association 2011 Annual Meeting	Denver, CO 2011
Fudan-Nanyang Technological University Workshop	Shanghai, China 2011
Ajou University, Department of Finance seminar	Korea 2011
Financial Management Association 2010 Annual Meeting	New York 2010
Exeter University, Business School Seminar,	Exeter, UK 2010
Durham University, Business School Seminar	Durham,UK 2010
8th Trans-Atlantic Doctoral Conference	London Business School, UK 2007
Max-Planck Seminar Series	Magdeburg, Germany, 2005
Fraunhofer Institute Industrial Mathematics Seminar	Kaierserslautern, Germany, 2004

ACHIEVEMENTS AND AWARDS

Krannert School of Management Five-Year Scholarship	Purdue University	2005-2010
Krannert School of Management Award for Outstanding Teaching	Purdue Univeristy	2007
Max Plank Institute Visiting Student Scholarship	Magdeburg, Germany	2005
Fraunhofer Institute Two-year Scholarship	Kaiserslautern, Germany	2003-2005
Excellent Graduate Student of Beijing City	Beijing Government	2003

ADDITIONAL PROFESSIONAL ACTIVITIES

- **Peer Reviewer:** Economic Theory, Review of Finance, Journal of Modern Finance and Accounting
- **Discussant:** Financial Management Association 2010 annual meeting, New York, 2010
- **Proof-Reader:** "Cones and Duality", C.D.Aliprantis and R.Tourky, Graduate Studies in Mathematics, Volume 84, 2007

PROFESSIONAL AFFILIATIONS

American Economic Association, American Finance Association, Financial Management Association

RELATED SKILLS

- **Software:** Stata/R/SAS/SPSS/Eviews, Matlab/ Maple, Latex
- **Programming:** C\C+ +. Visual Basic, Visual Foxpro , Visual C+ +
- **Languages:** Chinese(native), English(fluent), German(basic)