



Overreaction to policy changes in the housing market: Evidence from Shanghai

Zhengyi Zhou *

Shanghai Advanced Institute of Finance, Shanghai Jiao Tong University, Datong Plaza, 211 West Huaihai Road, Shanghai 200030, China
The University of Toronto, Joseph L. Rotman School of Management, 105 St George Street, Toronto, Ontario M5S 3E6, Canada



ARTICLE INFO

Article history:

Received 29 September 2015
Received in revised form 29 January 2016
Accepted 15 February 2016
Available online 22 February 2016

JEL classification:

P25
R38
R31

Keywords:

Policy
Overreaction
Housing market
Shanghai
China

ABSTRACT

With the data of housing transaction records of Shanghai during 2004–2015, this paper comprehensively analyzes the housing market in this metropolis, and pays special attention to the market dynamics related to the frequent policy changes. We focus on the secondary market, and build repeat sales indexes. Then the AR(1)–GARCH(1,1) model is applied to estimate the weight of housing consumption incentives relative to investment incentives. It turns out that the overall market features strong consumption incentives, especially in the suburb area. Moreover, the market tends to overreact to policy changes. Compared with the suburb area, downtown features more investment incentives, lower returns and volatility, and less overreaction to policy changes. We infer that long-term investors overreact less than consumers. Finally, the purchase restriction policy and the issue of non-local buyers are discussed.

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1. Introduction

Housing is undoubtedly one of the most important assets for households, and housing prices can be highly volatile. But in contrast to the large body of research about financial markets, housing has received only limited attention in the literature (Black et al., 2006). After the 2008 global financial crisis, the pre-crisis housing bubble in the U.S. (Kostovetsky, 2015) has been widely discussed by researchers. The bubble questions the rationality of investors in real estate markets. This paper adds to the discussion of investor rationality in the housing market. But instead of discussing how irrational speculation in the house market affects the business circle, we focus on short-term market dynamics. We especially underline the market's response to policy changes, which is necessary for policy makers to understand so as to make optimal decisions.

We study this topic by analyzing the housing market of Shanghai, a Chinese metropolis. In the past two decades, the Chinese housing market has experienced rapid price growth and frequent government interventions. The high and rising housing price (Wu et al., 2012) is often mentioned when people talk about the national economy. Using data of 1992–2002, Lau and Li (2006) address the low levels of housing

affordability in Beijing. Fang et al. (2015) claim that housing prices had an average annual real growth rate of 13.1% (10.5%) during 2003–2013 in first-tier (second-tier) cities. Some papers find evidence of housing bubbles in China (Dreger, Zhang, 2013), although so far no bubble burst phenomenon has taken place in Shanghai. To make houses more affordable, the government has introduced various policies to slow down the price growth, such as raising the down-payment requirement, raising the baseline mortgage interest rate, and exerting purchase restrictions on some buyers. The down-payment ratio of a household's second house was once as high as 70%. On the other hand, when the housing market occasionally arrives at the edge of a downturn because of changes in the economic condition, the government will encourage transactions, perhaps to prevent a housing market crisis or to protect land value which is an important income source of the government.

The government's active counter-cyclical intervention is an important feature of the housing market in China, and provides a good opportunity to examine the market's response to policy changes. Pastor and Veronesi (2012) and Pastor and Veronesi (2013) predict that participants in the stock market will respond to government actions. This paper focuses on the market's response to policy changes in the housing market. More specifically, we examine if the market overreacts to policy changes, and explore the determinants of the overreaction degree. As noted by Glaeser (2004), the theory of situationalism predicts that

* Permanent address: Datong Plaza, 211 West Huaihai Road, Shanghai 200030, China.
E-mail address: zyzhou.12@saif.sjtu.edu.cn.

people make decisions based on local influences rather than long-run well-being. This indicates that people may overreact to new events, including sudden policy changes in the housing market. And compared with the stock market, the housing market is more dominated by individual traders rather than institutional traders, so overreaction may be more obvious in the housing market than in the stock market.

We obtain a unique data of housing transaction records in Shanghai, one of the biggest cities and economic centers in China. The data permits us to study the market's overreaction to policy changes. We do this by several steps. First, we make monthly house price indexes for both the overall market and the submarkets. The repeat-sales approach (Case, Shiller, 1987) is adopted, and we compare our index with the indexes made through alternative methods and those made by other researchers. Second, we observe how housing prices and transaction volumes respond to policy changes, and examine whether the overreaction to policy changes varies in different regions. Third, we explore the market features in different regions, and pay special attention to the strength of investment incentives on the demand side. Then we discuss how these features are related to the submarkets' sensitivity to policy changes.

The city of Shanghai in China is a good setting to test people's overreaction to policy changes in the housing market for several reasons. First, as we have mentioned, the Chinese housing market has experienced frequent policy changes. More importantly, apart from the indirect tools that must work through mortgage interest rates, direct tools are also used. For instance, there are restrictions about the number of houses that a household can buy, and restrictions about the mortgage accessibility of non-local buyers. So it will be easier for us to build the causal relationship between policies and market dynamics. Second, Shanghai is an extremely interesting and important city in China. Although Shanghai's residents occupy less than 2% of China's total population, its housing market accounts for 20% of the country's total residential property value (Chen et al., 2010). At the end of 2013, the loan balance of the real estate industry in Shanghai is 12.16% of that in the whole country. Thus, understanding the Shanghai housing market is helpful for understanding people's behavior in the Chinese housing market. Third, as a huge metropolis with about 25 million permanent residents, Shanghai shares many common characteristics with other big cities in the world. The similarity of people's behavior also suggests that conclusions from this paper are not limited to Shanghai.

Through comprehensive empirical analysis, we have vital findings. For reasons explained later, we focus on the secondary market. The repeat sales index shows that the housing prices grew by about 242% during the period Dec, 2006–May, 2015. The AR(1)–GARCH(1, 1) model shows a negative risk–return relation, which means that the consumption incentives in the market are strong enough to mute the positive risk–return relation of normal investment goods (Han, 2013). More interestingly, when a tightening policy arrives at the housing market, the housing prices and trading volumes first drop and then quickly rebound. This drop-rebound pattern provides evidence of the market participants' overreaction. In contrast, the market responds to loosening policies more peacefully; there is no evidence of overreaction.

Looking into the submarkets, we find that the downtown market has lower returns and volatility than the suburb market. And unlike the returns of suburb houses, those of downtown houses display a positive risk–return relation, suggesting that the investment incentives are stronger in downtown than in suburb. This point is further confirmed by an analysis about the interaction between the housing market and the stock market. Then by examining the response to policy changes, we find that the downtown market overreacts less. This evidence is consistent with De Long et al. (1990) that long-term investors help stabilize asset prices. Considering that the median lag between two successive transactions of a house is 31 months in downtown and 29 months in suburb, the downtown investors can be reasonably regarded as long-term investors.

To the extent that people overreact to tightening policies, government interventions introduce extra volatility. This can only be justified

if the interventions are really able to stabilize the market in the medium or long run. Nevertheless, an uncomfortable fact is that the housing prices have kept going up in spite of the various tightening policies. Our analysis reveals one important reason. That is, there are always strong consumption incentives that form huge demand in the market, while most of the tightening policies were designed to fight against speculations. Of course, it is possible that housing prices would have grown even faster if there had not been such tightening policies. To fully evaluate the welfare implication of the policies, a counter-factual analysis based on a theoretical model is needed, which is not the goal of the current paper. But the bottom line is that, the fast price growth has been supported by strong consumption incentives, which tend to overreact to tightening policies.

The contributions of this article are varied. First, as far as we know, we provide the first analysis about the influence of policy changes on short-term housing market dynamics. Our work is worth reading for regulators and people who are interested in participating in the Chinese housing market. Second, we build the first pure repeat sales index for Shanghai. This is complementary to other housing price indexes for Chinese cities, such as the hedonic ones (Ling, Hui, 2013; Fang et al., 2015) and those based on matching approaches (Wu et al., 2014; Guo et al., 2014). Third, we provide another check for individuals' situationalism (Glaeser, 2004). While the overreaction of agents to major news has been extensively examined in financial markets, studies regarding the overreaction in the housing market are still scarce (Deng et al., 2013), and we fill this gap. Fourthly, we are among the few papers that address the regional difference of housing markets within a city, so our findings are meaningful for the decision making of house buyers and city planners.

The rest of this paper is arranged as follows. Section 2 provides literature review. Section 3 documents the policy change history in the Shanghai housing market, and introduces our data. Section 4 constructs housing price indexes and explores regional differences within the city. Section 5 examines the housing markets' overreaction to policy changes. Section 6 analyzes the investment incentives in different areas, and discusses how it is related to the degree of overreaction to policy changes. Section 7 provides robustness checks and further discussions, which consider houses in different price percentiles, the issue of non-local buyers, the potential regime switching during the sample period, etc. Finally, Section 8 concludes.

2. Literature review

Relative to the big amount of evidence that investors have behavior bias such as overreaction in the financial markets (Bondt, Thaler, 1985; Ederington, Lee, 1993; Hong, Stein, 1999; Brooks et al., 2003; Brown et al., 2013), behavioral issues are less documented for the real estate markets. But considering that real estate markets are more dominated by individual traders than stock markets are, it is necessary to take into account the irrationality of traders when analyzing the markets' dynamics. Hong and Stein (1999) claim that investors' exploiting of the price underreaction due to slow information diffusion can eventually lead to price overreaction; this is likely to happen in the real estate markets which often feature thin trading and slow information diffusion (Case, Shiller, 1987). Consistent with this idea, Fu and Qian (2014) find that in the Singapore housing market, speculators contribute to price overreaction through momentum trading. Also, Deng et al. (2013) observe that the relative price of low to high floor units in Chengdu overshoot after the 2008 Wenchuan Earthquake. Nevertheless, none of these empirical works emphasizes on the role of policy changes in arousing overreaction. Xu et al. (2015) use the data from Beijing's housing market to investigate the rising demand for subway after driving restriction, and finds evidence for an overshooting in the subway premium in the first few months immediately following implementation of the CDR policy. With a different research goal, our paper

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