Policy failure or success? Detecting market failure in China's housing market

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ABSTRACT

Due to a high vacancy rate of residential homes, housing prices remain sticky in most urban areas of China, which causes higher searching and bargaining costs. With an inefficient outcome, deadweight loss and market failure arises. To assess the Chinese government's housing policies in 2010, we develop a dynamic equilibrium model, in which we demonstrate how the sticky price results in market failure. We apply a multiple-factor panel data model to show that a high degree of market failure is associated with a high ratio of persistent components in the gap between price and equilibrium. As the persistent components will cause the market's instability, we can use the ratio between persistent and mean reverting components as an indicator to supervise the status of the housing market.

We investigate the new and second-hand markets in 19 major cities, including 4 municipalities and 15 vice-provincial cities. Through our multiple-factor model, we explore the situation for each city. The results indicate these policies did improve the housing market's efficiency. It is therefore useful for the Chinese government to extend these policies to other areas to include not only big cities, but entire provinces which can improve its economic system efficiency and fairness even when its economic growth is slowing down.

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1. Introduction

Ever since China released the housing policy *State Council Document Number 10* on April 17, 2010, its housing market has experienced many changes. Various actions affecting the market include tightening mortgage rates, rising down payments for second homes, restricting house purchases, and rising property taxes.[1] China's government used these instruments to slow down the soaring housing prices and make houses affordable for the public. We are interested in the effects following the implementation of these policies, and whether the housing market became more efficient or just pulled back from the rising prices.

Regarding the new and second-hand housing markets, this article focuses on comparing the situations during pre- and post-policy shock periods. Following Parkin (2014), we define a market failure as a situation in which a market delivers an inefficient outcome. In order to evaluate a situation, we develop a dynamic equilibrium

model, whereby we reveal the relationship between transaction cost and market failure. Because houses are unique and sellers usually post their selling price higher than the equilibrium to maximize their own profit (or increase their surplus), vacancies always exist, which provide buyers with more choices. If the number of vacancies is large, this indicates buyers might have more searching work to explore the suitable objectives. According to Commons (1931), transaction cost includes searching costs, bargaining costs, and policing and enforcement costs.

It is a well known fact that, China's economy features a high degree of income disparity. A report by the Peking University Institute of Social Science Survey showed that income inequality among Chinese citizens in 2014 had reached a severe condition, as the richest 1% of China's population possessed 1/3 of the country's wealth, while the poorest 25% of Chinese citizens owned only 1% of the country's wealth. Due to the perceived low risk of real estate, owning a house has always been one of the favored investments for wealthy Chinese. Compared to other countries, China's real estate tax is relatively low, with the tax for self-occupancy at 0% and non-self-occupancy between 0.4% and 0.6%, which are far below other countries, like Singapore, at 4% (self-occupied) and 10% (not self-occupied). This is one of several factors supporting China's high housing prices. Some places even have so-called "luxury residence"

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units with astonishingly high prices that are unaffordable for average income residents, while vacant units are still widely scattered over these communities. More seriously, some areas gained media attention for having ghost cities due to a large inventory of vacant houses. This is why the Chinese government implemented the housing policies in 2010. Real estate is an asset form with limited liquidity and is capital intensive when compared to other investments. Therefore, the housing market plays a crucial role in an economic system. If it cannot allocate resources efficiently, then this not only influences capital flow and resource allocation, but also affects a country's economic growth.

A speculator invests money in the housing market in order to gain a return in the future. If the government raises the mortgage interest rate and tax rate, then this indicates a rising opportunity cost to own a house, and as such demand will decrease. At the same time, it also increases the holding cost for a vacancy, which will push the rigid price toward equilibrium quickly and force the sellers to cut their prices in order to shorten their holding period, which will increase the quantity demanded and decrease the quantity supplied. This study investigates the effects of China's housing policies in 2010. As new and second-hand housing markets have different characteristics, we detect market failures in the two and evaluate their effects.

There is a lot of literature discussing the behavior of housing prices. Kenny (1999) applied a co-integration analysis to identify the variables of demand and supply sides of the Irish housing market, in which income, mortgage interest rate, and housing stock are used to evaluate short- and long-run relationships. Zhang et al. (2012) used a nonlinear time series model with key factors including mortgage rate, producer price, money supply and real exchange rate to interpret dynamics of housing prices. Zhang et al. (2013) argued that the high housing prices are partly caused by some real factors, and provided a calibrated model to estimate the effects of policies that control land use on housing prices in China. Guan (2013),
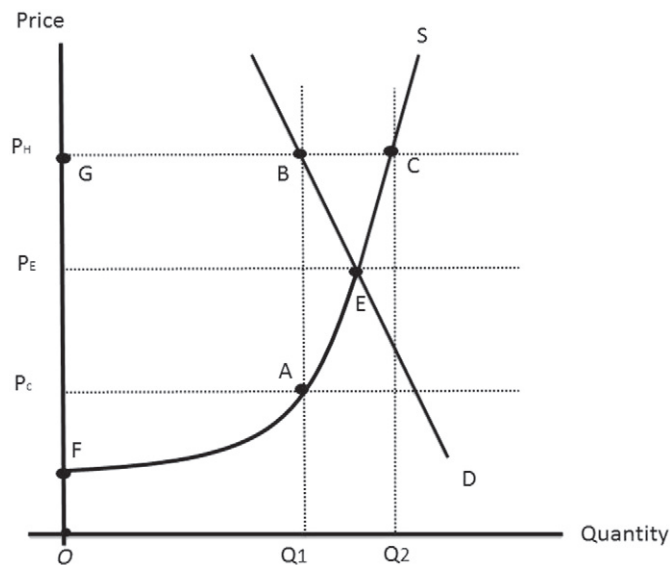
Kang and Liu (2014), and Feng and Wu (2015) addressed the problem of soaring housing prices in China and discussed what caused houses to become unaffordable. Zeng et al. (2013) analyzed the effect of household wealth on housing sales and probed their long-run and short-run dynamic relationships, which show that housing wealth, income, and mortgage rates affect housing sales in the long-run. Selcuk (2013) developed an equilibrium search model of the housing market, in which the sale time expresses the sellers' distress when the houses are unable to sell. Wang and Zhang (2014) evaluated the importance of fundamental changes in explaining the rising housing prices in urban China in the 2000s. Shih et al. (2014) used a unit root test to detect when housing price bubbles were rising, in which prices could have a potential contagious effect among the provinces. Wen and He (2015) used a dynamic stochastic general equilibrium model to investigate the key driving force of housing price fluctuations. Zhang (2015) demonstrated a significant correlation exists between income inequality and housing-price-to-income ratio, and showed the importance to keep housing price reasonable. Feng and Wu (2015) as well as Cai and Lu (2015) investigated rapid housing price growth and a high price-to-income ratio in major Chinese cities and discussed whether there is an asset bubble in China's residential housing market. They focused on affordability when developing a housing policy and proposed a broader housing appropriateness concept.

There is also an alternative stream of literature focusing on market failure. For example Gallin (2006) initiated panel data tests to detect the co-integrated relationship, which includes several variables, such as income per capita, the construction wage, user cost, population, and stock market. The author showed that even researchers who used powerful tests still cannot find the co-integration relationship, suggesting that the error-correction specification for house prices and income commonly found in the literature may be inappropriate. Tsai (2013) demonstrated the defensive characteristics of housing prices known as downward price rigidity by using the loss aversion behavior of traders to assess the viability of housing price rigidity.

He (2013) and Barros et al. (2014) demonstrated that housing supply and demand have a time lag and noted that it is reasonable to have vacancy areas. He (2013) used Chengdu as an example. He illustrated the market failure and suggested that the local government should intervene in the housing market to ensure the city's development. Barros et al. (2014) used Beijing as an example and provided a framework by using the number of vacant houses to explain the delay of house sales. Cao and Keivani (2014) provided a review of China's urban housing outcomes, revealing housing price inflation and a shortage of affordable housing in the fast expanding housing market. They advocated for more effective and direct public intervention for enhancing social housing provisions and tightening market regulations for lower income groups. Liu and Wong (2015) investigated the causes of misallocation of economic housing in Beijing, and addressed the importance of balancing the growth-led policy with social equity and redistribution of public resources. Zhou (2016) used Shanghai as an example, demonstrating the overreaction to policy changes in the housing market, in which the long-term investors overreact less than consumers.

Different from previous studies, this article emphasizes the degree of market failure. We suggest that market failure prevalently exists, and the gap between housing prices and the market equilibrium may be comprised of different components, including persistence and mean reversion. If the component shows a mean reversion characteristic, then this indicates the price will adjust itself quickly toward the equilibrium. This is different from a component that possesses a persistent characteristic, whose price will not move toward equilibrium. We compare the pre- and post-housing policy periods and measure the proportions of persistence, which represents the degree of market failure.

Fig. 1. Because a house is unique and the seller maximizes his or her profit, the price is usually set publicly above the equilibrium at the beginning. Thus, vacancies always exist. Suggesting the beginning price is set at P_H, as the quantity supplied is greater than the quantity demanded (between B and C), the vacant houses provide the buyers more choices. This will cause a searching and bargaining cost. In this case, if the quantity supplied is fixed at Q_1, then the marginal benefit (B point) is far higher than marginal cost (A point), and there exists a lot of bargain space. Eventually, the transaction price might fall toward equilibrium price P_E, but the searching and bargaining cost already has arisen. If this market is at a low degree of transparency, then the gap between the price and equilibrium will become persistent.