



Housing demand or money supply? A new Keynesian dynamic stochastic general equilibrium model on China's housing market fluctuations

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HIGHLIGHTS

- We investigate the key driving force of housing price fluctuations in China using DSGE.
- We compare the role of housing demand shock and money supply shock.
- Housing demand instead of money supply drives China's housing price.
- A house price-augmented money supply rule is suggested for China's housing policy.

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ABSTRACT

There is a bitter controversy over what drives the housing price in China in the existing literature. In this paper, we investigate the underlying driving force behind housing price fluctuations in China, especially focusing on the role of housing demand shock with that of money supply shock in explaining housing price movements, by a new Keynesian dynamic stochastic general equilibrium model. Empirical results suggest that it is housing demand, instead of money supply, that mainly drives China's housing price movements. Relevant policy implication is further discussed, namely, whether to consider the housing price fluctuations in the conduct of monetary policy. By means of the policy simulations, we find that a real house price-augmented money supply rule is a better monetary policy for China's economy stabilization.

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1. Introduction

In the past decades, many scholars have observed that movements in housing market are not just the consequences of wider macroeconomic developments, but also the driving forces of business cycles [1,2]. Iacoviello and Neri [2] point out that researches on the housing market has finally become one of the mainstream studies in economics. Leung [3] provides a survey of the interactive nexus between housing market and the macroeconomy. The importance of housing market in explaining the macroeconomy fluctuations is not only acknowledged by the academia, but also by the policy makers, since it is crucially important for both researchers and policy makers to better understand the issue so that appropriate policy adjustments or policy suggestions can be made or proposed to stabilize the housing market and macroeconomy. Taylor [4] examines the relationship between monetary policy and housing markets/housing finance. In the existing literature, the housing market is found to be highly correlated with the macroeconomy and even a key source of the macroeconomy

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fluctuations. As the housing markets fluctuate remarkably in the short term and have boom–bust cycle in the long run, the macroeconomy would suffer a lot from housing market fluctuations [1]. Besides, in order to conduct the economic policy effectively, one must suit the policy to the situation. It is thereby of critical importance to find out the underlying driving force behind housing market volatilities before making policy to stabilize effectively the housing market and the macroeconomy.

However, there is no consensus on the foresaid problem in existing literatures. Clayton [5] derives a forward-looking rational expectation house price model to explain short-run fluctuations in real house prices, and suggests that prices may temporarily deviate from fundamental values in real estate price cycles. Ortalo-Magné and Rady [6] propose a life-cycle model with income heterogeneity and credit constraints to explain the observed co-movements of housing prices and owner occupancy rates in the UK. Capozza et al. [7] explore the determiner of the housing price dynamics, and find house prices react differently to economic shocks depending on such factors as growth rates, area sizes and construction costs. Ortalo-Magné and Rady [8] identify the ability of young households to afford the down payment on a starter home, and in particular their income as a powerful driving force of the housing market by a life-cycle model of the housing market with a property ladder and a credit constraint. Mankiw and Weil [9], however, focus for the first time on the demographic influences on housing demand and real housing prices. From an urbanization perspective, early urban economists, including Alonso [10] and Muth [11], attempt to investigate the interactions between housing markets and urban expansion. Beltratti and Morana [12] concentrate on the linkages between general macroeconomic conditions and the housing markets for the G-7 countries, and find that the US is an important source of global housing price fluctuations for real housing prices.

Unfortunately, it appears to be even more controversial on the main driving force of housing market fluctuations in China in the existing literature. Various models and theories are proposed, trying to explain house price movements in China; some focus on demand driven, while others consider growth of money supply.

The demand driven theory attributes house price movements to changes in housing demand, which are mostly fueled by changes in household income [13], competition among men in the marriage market [14], and rural–urban migration and urbanization [15]. Wei et al. [14] assume that housing is a status good in China's marriage market and examine the consequences for house prices. The authors find empirical evidence to support this hypothesis and further a rise in the sex ratio accounted for 30%–48% of the rise in urban house prices in China during 2003–2009. Chen et al. [15] explore the possible effects of rural–urban migration and urbanization on China's urban housing prices, and conclude that the different urbanization levels and the migration situations have significant effects on urban house prices in China. In summary, the demand driven theory believes that housing demand is caused by household income, marriage and migration/urbanization is one of important determining factors in explaining the housing price movements in China.

With respect to the role of money supply growth, many other scholars believe that China's monetary policies act as the key driving force behind the severe fluctuations of housing price in China. Using a nonlinear modeling approach, Zhang et al. [16] investigate determinants of housing prices in China over the period from January 1999 to June 2010, and show that monetary policies and price variables are the key factors influencing house prices in China, while other aggregate economic variables have relatively less significant impacts. Xu and Chen [17] examine empirically the impact of key monetary policy variables, including long-term benchmark bank loan rate, money supply growth, and mortgage credit policy indicator, on the real estate price growth dynamics in China, and find that faster money supply growth tends to accelerate the subsequent home price growth, and vice versa. By a standard multivariate dynamic model, Zhang [18] explores the causal relationship among monetary growth, house price inflation and consumer price inflation in China since 1998, and suggests that the recent real estate market boom is mainly driven by excessive monetary growth in China.

Inspired by the existing literatures [19–21], we endeavor to find out the answer to the foresaid problem, and to better understand the underlying driving force the housing price fluctuation in China. The main contributions of our work can thereby be summarized as follows: we answer the question in this paper by quantitatively investigating the contributions of housing demand and money supply shocks to housing price fluctuations within an integrated Keynesian DSGE framework; and based on our quantitative results from the empirical analyses and policy simulations, we find that a real house price-augmented money supply rule is a better monetary policy for China's economy stabilization. To do that, inspired by Burdekin and Siklos [20] and Zhang [21], we consider a money supply rule in this new Keynesian DSGE model. Using quarterly data from 2001:Q1 to 2012:Q4, we further estimate the model with Bayesian methods. Impulse response analysis and variance decomposition are applied to identify the relative importance of housing demand shock and money supply shock to housing price movements. Based on empirical results, relevant policy implication is also discussed, to better address this issue in the Chinese economy. In this regard, our model and findings pertinently address and attempt to solve the ongoing China's economic puzzle, and have potential applications to both theoretical housing market researches and practical monetary policy making in China (and possibly other emerging markets).

The rest of the paper is structured as follows. In Section 2 we describe the baseline model and estimate the parameters in Section 3. Section 4 represents the main results, including the main source of housing price fluctuations and implications for monetary policy. Section 5 concludes.

2. The model

In this section, we propose a new Keynesian DSGE model with money supply rule and credit constraint in order to capture some features of the Chinese economy. We consider a discrete time, infinite horizon economy, populated by households, entrepreneurs and retailers infinitely lived and of measure one. Households supply labor to entrepreneurs, demand housing

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