Exploring the relationship between urban land supply and housing stock: Evidence from 35 cities in China

Xiaoyan Shen[a], Xianjin Huang[a,*], Huan Li[b,**], Yi Li[c], Xiaofeng Zhao[d]

[a] School of Geographic and Oceanographic Science, Research Centre of Human Geography, Nanjing University, Nanjing 210023, China
[b] Department of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong
[c] School of Public Administration, National Research Centre for Resettlement, Hohai University, Nanjing 210098, China
[d] School of Public Administration, Hohai University, Nanjing 210098, China

ARTICLE INFO	ABSTRACT
	This article investigates how government intervention in the urban land supply affects China's housing market over time using panel data from 35 cities between 2004 and 2014. We find that the restriction of urban land supply has varied effects upon real estate destocking over different time periods and under the influence of the development status of different cities. In cities with relatively high housing-price-to-income ratios (> 9), the effect of residential land quota control is not substantial within three years, whereas that of land supply price regulation is significant. In contrast, in cities with relatively low housing-price-to-income ratios (< 7), quantitative control of land supply has a significant positive effect on real estate destocking. For cities whose ratios lie between 7 and 9, regulation of both land supply and land price negatively impact the housing market. Moreover, we cannot neglect the fact that these government interventions in the land market will have crucial consequences on housing consumption due to subjective psychological expectations. Based on these findings, we argue that top-down policy intervention should be more prudent, and that future government regulations need to be refined to consider specific local conditions.

1. Introduction

As a collective provision understood to sustain social reproduction, housing is often considered to be a pillar upon which social policy and the economy are built. However, the dynamics and balance between residential housing supply and demand remain among the most troublesome issues for governments worldwide. Housing in developing countries is often inadequate in both quantity and quality due to housing deficits. In contrast, volatile housing prices and housing bubbles in advanced economies have triggered, and remain likely to lead to, catastrophic economic crises (Gjerstad & Smith, 2009). Understanding, and hence proactively intervening in, boom-bust housing cycles has become a critical topic for scholars in fields including housing studies, urban economics, urban geography, urban planning, and so on (Chen & Fik, 2017; Glaeser, Gyourko, & Saiz, 2008; Huang & Chiang, 2017; Jiang, Phillips, & Yu, 2015).

Following a planned economic system with limited allocated welfare housing, China gradually introduced a commercial housing market beginning in 1998 (Wu, 2015). China's rapid urbanization in the past 20 years has been accompanied by even faster increases in real estate

prices (Wu, Mo, & Peng, 2017). From city centers to the suburbs, the recent dramatic increases in housing prices in China have drawn considerable attention from both domestic and international scholars (Chen & Wen, 2017; Glaeser, Huang, Ma, & Shleifer, 2017; Teng, Chang, & Chen, 2017). According to World Bank statistics, China's 2016 GDP was 11 trillion USD; the 715 billion USD generated by the real estate industry accounts for 6.5% of the GDP. The output value of the Chinese real estate industry in 2016 was about equal to the total 2016 GDP (703 billion) of the Netherlands, which ranked 17th in the world. However, converse to this apparent prosperity, China's real estate market is subject to several serious problems including excessive price increases (Coulson & Tang, 2013), an imbalance between supply and demand (Wang & Wang, 2012), and market structure distortion (Du, Yang, Li, & Zuo, 2017). Surprisingly, large housing stocks and significant property vacancy rates are also documented in some Chinese cities (Jin et al., 2017; Shepard, 2015; Zhang, Jia, & Yang, 2016). Housing stock is deemed a benchmark for the real estate market and is an indicator of turning points in the housing cycle (Booth & Choudhary, 2013). According to statistics from the Chinese Academy of Social Sciences, the total housing area in stock is about 3 billion square

meters, with an annual growth rate of 46%. Given this backdrop, great concern has arisen about risks associated with Chinese housing markets (Wu, Gyourko, & Deng, 2016); this is a dangerous signal for the Chinese real estate industry, and could have traumatic implications for the national economy as a whole (Feng & Wu, 2015; Li & Chand, 2013).

Unlike markets in liberal democratic western countries, the Chinese property market is tremendously impacted by top-down policies due to China's public land ownership (Huang, Li, Yu, & Zhao, 2014). In order to develop a healthy and sustainable housing market, the Chinese central government has rolled out a series of documents and instructions that strongly intervene in the real estate industry (Wu, Luo, Zhang, & Skitmore, 2016). Under a central command to 'methodically digest' extant real estate stock beginning at the end of 2015, housing destocking has become a catchphrase in both official media and documentation in China (Faulkner, 2016). The central government considers this land supply policy to be an indispensable vehicle in policy packages promoting housing market regulation (Hui & Wang, 2014; Li, Huang, Kwan, Bao, & Jefferson, 2015), and seems to have placed hope in changing land supply policy to address property market overheating and ensure economic sustainability in the short term (Du, Ma, & An, 2011). However, so far, the impact of this policy is rather controversial (Zhang, Fan, & Mo, 2017; Zhang, Liu, Fan, & Horsewood, 2017).

The use of land policy to re-regulate the real estate market is nothing new in China. However, policies have been introduced, and reintroduced, with little effort to examine the actual policy effectiveness. To rectify this oversight, this paper endeavors to examine the relationship between land supply and housing stock in practice. The aim of this research is to understand the real mechanism that influences the land supply policies affecting the real estate market, which can be broken down into the following three specific questions: (1) How does land supply policy affect the housing market? (2) What are the channels of influence? (3) When and where is the policy truly effective in influencing the property market? According to our analysis, the policy effectiveness varies significantly geographically. Hence, we question the current brutal top-down land regulations, which do not take local knowledge into account. We hope that this study can help the government and policy makers to reconsider and reformulate the current top-down land supply regulations. We argue that a more serious effort should be undertaken to refine the current policy with regard to the different characteristics of various cities and groups of property consumers.

2. Urban land regulation and the housing market in China: a historical policy review

Since the real estate industry in China started to become vibrant in 1992, land regulation has played an increasingly important role in regulatory policies. By 2003 the status of land regulation had been officially affirmed, and policies regulating the real estate market have been implemented more frequently since. Table 1 shows that macro-control of land, a key target of policy control, has played a pivotal role in China's economic development, and especially in regulating the real estate market.

The period between 2003 and 2006 marks the beginning of land macro-control. A series of policies aimed at bringing order to the land market and stabilizing housing prices were launched. Major manifestations of this policy in the land market included crackdowns on land hoarding, controls on the supply of residential land, and regulation of residential land structures. During this phase, land regulation and related policies were tightened. The restriction of residential land supplies did curb the total volume of investments in fixed assets and the excessive growth of real estate investments to some extent. Due to the global financial crisis of 2007–2008, there was a decline in the land and real estate markets, with attenuated growth in real estate and fixed

asset investments. In an effort to boost economic development, China's State Council proposed a series of specific measures to facilitate the steady growth of the real estate market and the economy in general.

The real estate market recovered rapidly from the latter half of 2009 onward owing to a series of domestic measures intended to stimulate the economy and recovery from the global financial crisis. In response, both housing and land prices rose rapidly, and national regulation turned again towards rigorous control. The strictest control on the real estate market occurred since 2010. The "National Eleven Articles" (*guo shiyitiao*, which is an abbreviation for the "Notice on Promoting the Steady and Healthy Development of the Real Estate Market") focused on "steady and healthy" development while the "New National Ten Articles" (*xin guo shitiao*, which is an abbreviation for the "Notice on Firmly Containing Sharp Increases in Housing Prices in Certain Cities") were upgraded to "resolute containment," and the "National Five Articles" (*guo wutiao,* which is an abbreviation for the "Notice on Further Improving Regulation of the Real Estate Market") issued in 2013 became even more rigorous. In the meantime, policies limiting housing purchases and home loans were issued successively in an effort from the demand side to contain demand for speculative and investment purchases. Land policies during this time focused on guaranteeing the supply of land for affordable housing; consequently, this supply began to increase significantly.

Regional differentiation in the real estate market became prominent when restrictions on housing purchases were eased after 2014. During this period, land policies focused on differentiated regulation, promoting reasonable housing stock scale and structure, and varying land supplies to suit specific demand-supply situations in different cities. Overall, land regulation has been an important policy vehicle employed by the government to regulate the property market. However, ensuing policy impacts have not been examined sufficiently.

3. Unpacking the relationship between urban land supply and housing stock: the analytical framework

In this research, urban land supply policy is classified by its policy manifestations, including land supply quantity and land supply price (Li, Wu, Huang, Sloan, & Skitmore, 2017). Land supply quantity refers to the total amount of state-owned construction land. As the government monopolizes the primary land market, it is possible to intervene in the housing market via the urban land supply. In other words, the government wishes to balance supply and demand in the housing market by regulating the quantity of land available. Land supply price is the basis of housing price (Huang, Li, & Hay, 2016); it is directly related to the cost of housing and influences variability in housing price expectations, further affecting housing demand.

We hypothesize that land supply policies affect housing stock via different channels. These channels are independent and exist at the same time, while they have different intensity of influence in different condition. In our research, these routes of influence are divided into two categories: 1) objective channels, which are based on supply-demand theory (Du et al., 2017; Kwoun, Lee, Kim, & Kim, 2013), and 2) subjective channels, which are based on psychological expectations (Huang, 2013; Yang & Li, 2015). 'Objective channel' refers to the interrelated and mutually restricted objective laws defining the relationship between housing supply and demand in the commodity economy. Since land is the essential factor of production in the process of housing generation, the relationship between land and housing follows the theory of supply and demand. According to these objective housing market laws, the government can regulate the housing stock by developing appropriate land supply policy (Fig. 1A). The subjective channel encompasses judgment on the housing market based on psychological expectations (Gong & Dai, 2017). Changes in land supply policy will cause changes in the housing market expectations of