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# The heterogeneity of market supply effects of public housing provision: Empirical evidence from China



Jie Chen\*, Huifu Nong

School of Public Economics and Administration & Institute of Advanced Research, Shanghai University of Finance and Economics (SHUFE), China

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## ABSTRACT

This paper examines why and how public housing provision may affect the supply of market-based housing in urban China. We illustrate how both the demand mechanism and the cost mechanism may lead to the crowding-out effect of public housing provision on market housing provision in post-reform urban China. Based on panels of both provincial-level and city-level data for the period of 1999–2010, our empirical results shows that: (1) the supply of public housing has crowding-out effect on the supply of market housing in China but its degree is generally moderate; (2) the crowding-out effect varies substantially under different scenarios; (3) the crowding effect changes over time but its estimation accuracy is gradually improving in the sample period. The findings in this paper have useful implications to the design of public housing programs in general.

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## 1. Introduction

One of the most classic topics in public policy analysis is whether and to what extent the public provision of goods would crowd out the market provision of goods (Andreoni, 1993; Aschauer, 1989). Compared with other fields, public involvement in the provision of housing is subject to much more controversy. Besides many literatures cast doubts on the efficiency as well as the equity of the state expenditure on housing construction (Leung et al., 2012), a frequently raised challenge is the public provision of housing may have negative impacts on the market provision of housing. For example, a number of US-based studies find that government-supported housing supply completely or partly crowd out private housing supply (Murray, 1983; Murray, 1999; Eriksen and Rosen-

thal, 2010; Malpezzi and Vandell, 2002; Sinai and Waldfoegel, 2005). A recent Korean-based study produced similar findings (Lee, 2007).

However, a few questions related to the impact of public housing on market housing remain unanswered, for example, (i) at what level does the public housing supply start increasing the crowding-out effect on the market-based housing supply; (ii) what regional specific characteristics alter the intensity of supply of public housing on the supply of market housing. As the Table 1 in Section 4 of this paper show that the provinces (or cities) in the dataset of this study vary widely from each other in both housing market characteristics and macroeconomic environment. Thus, these two questions above become more important, and we will advance the view of heterogeneous and nonlinear crowding effects of public housing on market housing in post-reform China.

Since 1998, housing investment has consistently accounted for around 20% of total investment, and roughly 10% of GDP in China. Meanwhile, the public housing that developed and delivered by the state continuously

\* Corresponding author. Fax: +86 2165104294.

E-mail addresses: [chen.jie@mail.shufe.edu.cn](mailto:chen.jie@mail.shufe.edu.cn), [chenjie\\_fudan@163.com](mailto:chenjie_fudan@163.com) (J. Chen), [sg.afu@live.com](mailto:sg.afu@live.com) (H. Nong).

constitutes a significant portion of total housing supply in urban China (Chen et al., 2014). The share of public housing in China's urban housing provision has become increasing more prominent in recent years, especially when the Chinese government launched the project of constructing 36 million units of public housing during the 12th Five-Year Plan period (2011–2015). It has been suggested that the new Chinese public housing construction would be the largest public housing construction program in human history (Chen et al., 2014). Thus, it is of great interests to investigate issues such as whether the large-scale provision of public housing had crowd out the market provision of housing in China, as well as when and how crowding out effect occurred. Particularly, in 2014–2015 the growth speed of China's GDP has lost its momentum, dropped below 7.5% in 2014 for the first time since 1990 and continued to decline to 6.9% in 2015. What accompanied is the annual growth rate of real estate investment plunged by half in 2014 and for the first time dropped below 11% since 1998; it further collapsed to 1% in 2015. It is therefore naturally wondering whether and how much the recent slowdown of China's economic growth can be related to the massive expansion of public housing development. Considering the growing importance of China's economy in the landscape of global economy, such investigation may have wide policy implications.

According to the Chinese Prime Minister Keqiang Li (Li, 2011), the provision of public housing mainly aims at addressing the housing affordability problems of low- and middle- income urban households and would play a prominent role in the Chinese social security system. After accomplishing the market-oriented reform of urban housing system in the late 1990s, the Chinese housing sector has embarked a sustained construction boom: the annual output of newly-constructed housing increased from 0.476 billion sqm in 1998 to 1.08 billion sqm in 2014, and the share of market-oriented housing grew from 30% to 74% over this period (NBSC, 2016). However, since the beginning of this century nearly all major Chinese cities has experienced rocketing growth of housing price: the average price of market housing soared from 1854 RMB per sqm in 1998 to 6742 RMB per sqm in 2015 (NBSC, 2016)<sup>1</sup>. The mounting housing affordability crisis in urban areas has become an acute social issue and even poses threats to political stability (Chen et al., 2014).

As described in a recent speech delivered by the Chinese President Jinping Xi, the development of public housing has been attached with plenty political significances such as 'the inevitable requirement to promote social justice and ensure the public sharing the achievements of reform and development' (Xi, 2013). Thus, in recent years the expansion of state role in China's urban housing supply has attracted growing attention in the international literature (Wang and Murie, 2011). Nevertheless, most existing literatures mainly concerns about the planning challenges, financing problems and distribution justice of the new Chinese public housing program (Deng et al., 2011; Huang, 2012; Chen et al., 2014); little has been devoted to

study the market effects of public housing in post-reform China. This paper aims to bridge this research gap.

Briefly, the present paper employs both the Chinese provincial panel data (named Panel A) and city-level panel data (named Panel B) over the period 1999–2010 to study the impacts of public housing provision on market housing provision. An array of state-of-the-art econometric tools are applied. Particularly, non-linear dynamic panel threshold regression (PTR) model and dynamic GMM techniques are employed to take care the potential nonlinear pattern in the crowding effect. Further, we also investigate how the degree of crowding effect changes over time. These findings of such work not only have important implications to help improving the design of public housing programs in China but also shed new light on the various market effects of public housing programs in general.

The remaining structure of this paper is as follow. In Sections 2 and 3, we provide a review of related literatures and introduce the theoretical framework; in Section 4, we describe the data and econometric models; Section 5 presents our empirical results and discussions of findings; and Section 6 concludes this paper with our policy recommendations.

## 2. The literature review

From a border perspective, whether the relationship between public investment and private investment is mutually exclusive or complementary to each other has been a sustained research issue in general public policy analysis (Erenburg and Wohar, 1995). Knowledge on the conditions of crowding-out effect and its influence degrees has significant impact on public investment's policy making (Blömquist and Christiansen, 1998). For example, there are a number of empirical evidences suggesting that government employment may crowd out private employment (Malley and Moutos, 1996), public insurance may depress private insurance (Cutler and Gruber, 1996), and state funding to charity institutions may reduce private contribution to charity (Kingma, 1989; Andreoni and Payne, 2003). Nonetheless, it is also widely observed that public investment may crowd in rather than crowd out private investment in certain scenarios. For example, public involvement in fields such as infrastructure, R&D and venture capital is most often complementary rather than competing with private capital in these fields (Seitz, 1994; Leleux and Surlemont, 2003; Connolly, 1997).

The literature on the crowding effect of public housing on private housing has a long tradition but most are US-based research. During the 1960s and 1970s, the United States federal government carried out an ambitious plan of public housing development. It is estimated that the Department of Housing and Urban Development (HUD) subsidized 1.19 million housing starts over the period 1961–1977, which accounted for about 7% of total housing starts in that period (Murray, 1983). In view of the high cost and inefficiency of the subsidized housing program, since 1986 the United States government no longer provided direct state subsidies for newly constructed housing but instead created a dollar-for-dollar tax credit under the Tax Reform Act of 1986 (TRA86), which gives incentives for the

<sup>1</sup> The exchange rate of RMB vs. USD is on average 1: 6.3 in 2014.

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