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Tenure Security Premium in Informal Housing Markets: A Spatial Hedonic Analysis

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Summary. — This paper estimates slum residents' willingness to pay for formalized land tenure in Pune, India. The results show that the legal assurance of slum residents' occupancy of their lands could benefit them. Previous studies have discussed the legal and non-legal factors that substantially influence the tenure security of residents in informal settlements; however, it remains unclear how and to what extent the assignment of legal property rights through the formalization of land tenure improves the tenure security of residents in informal settlements and living conditions, even in the presence of other legal and non-legal factors that also contribute to their tenure security. To address this question, this study focuses on the city of Pune, India, where government agencies have formalized slums by legally ensuring the occupancy of the residents under the "slum declaration." Applying a hedonic price model to an original household survey, this paper investigates how slum residents evaluate formalized land tenure. A spatial econometrics method is also applied to account for spatial dependence and spatially autocorrelated unobserved errors. The spatial hedonic analysis shows that the premium of slum declaration is worth 19.2% of the average housing rent in slums. The associated marginal willingness to pay is equivalent to 6.7% of the average household expenditure, although it is heterogeneous depending on a household's caste and other legal conditions. This finding suggests that the assurance of occupancy rights is a vital component of land-tenure formalization policy even if it does not directly provide full property rights.

Keywords — slums, property rights, spatial econometrics, hedonic model, South Asia, India

1. INTRODUCTION

An unprecedented scale of urbanization has brought about challenges for urban planning in the Global South. Due to the persistent and insufficient supply of affordable housing in the formal housing markets, a vast number of people currently live in informal settlements with substandard housing and inadequate access to infrastructure and basic services. According to the United Nations, 33% of the urban population in developing regions, or 863 million people, lived in informal settlements as of 2012 (United Nations, 2012). These people, who often occupy land owned by others and/or land reserved for other uses, tend to be vulnerable to the threat of eviction. On the other hand, a bulk of residents in informal settlements—despite the lack of legal status in their occupancy—somehow stay free from the threat of eviction. Those residents who enjoy such *de facto* tenure security have incrementally consolidated their houses and improved their living environments. It is not rare that those people trade such invested houses in informal housing markets, where property rights are not enforced by laws and the state.

Previous studies have discussed legal and non-legal factors that substantially influence the tenure security of residents in informal settlements and their housing investment behaviors. A strand of economics literature posits that the assignment of legal property rights through the formalization of land tenure enhances the tenure security of residents in informal settlements and stimulates their housing investment (Demsetz, 1967; Field, 2005; Galiani & Schargrodsky, 2010; Bank, 1993). In particular, the assignment of legal property titles is expected to expand the financial capacity of residents in informal settlements by allowing them access to formal credit (de Soto, 2000); as reviewed by Payne, Durand-Lasserve, and Rakodi (2009), little empirical evidence has corroborated this hypothesis. Another line of literature emphasizes that many non-legal factors significantly shape the tenure security of residents in informal settlements and the enforcement of their property rights (Doebele, 1987; Lanjouw & Levy, 2002; Nakamura, 2016; Payne, 2002; Razzaz, 1993; Varley, 1987). A key question that remains unclear is how and to what extent legal land tenure improves the tenure security of residents in informal settlements and living conditions, even in the presence of other legal and non-legal factors that also contribute to their tenure security.

In order to address the empirical question above, this paper investigates how residents in informal settlements evaluate the benefits of quasi-legal land tenure in light of their tenure security and property rights. For this purpose, this research focuses on Pune, India, where a third of its population of three million currently reside in informal settlements, also called slums[1] (Government of India, 2013; MASHAL, 2011; Corporation, 2013). Government authorities have formalized about half of the slum settlements in the city under the state-level policy of "slum declaration." Similar policies are also implemented under the name of "slum notification" in other parts of India. This formalization of land tenure differs from common titling programs that provide full property titles; slum declaration only guarantees the occupancy of slum residents and their entitlement to basic services. Even in

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formalized or "declared" slums, people have no legal basis in other bundles of property rights, such as the right to develop, inherit, sell, lease, or mortgage their houses. This characteristic of slum declaration offers a researcher an opportunity to examine whether the legal assurance of occupancy rights, rather than the provision of a full bundle of property rights, can benefit slum dwellers.

For the empirical investigation, this paper assesses the slum residents' willingness to pay for the benefits of slum declaration. The primary data come from a survey collected from 562 households in the slums of Pune in 2013. Applying a generalized spatial two-stage least square (GSTSLS) model developed by Kelejian and Prucha (1999) and Kelejian and Prucha (2010), this paper develops a spatial hedonic model to identify and estimate the premium captured in housing rent in the informal housing market. Accounting for spatial autocorrelation and heterogeneity, as well as a host of housing, slum, and location characteristics, the model reveals the tenure security premium associated with slum declaration status. Based on the identification strategy proposed by Bajari and Benkard (2005) and Bajari and Kahn (2005), this paper then explores the heterogeneity of the estimated marginal willingness to pay (MWTP) depending on household characteristics.

The series of analyses performed in this paper clarify that even in the presence of other legal and non-legal factors, slum residents consider the benefits from the slum declaration as the factor that improves their tenure security. The hedonic analysis reveals that slum declaration status is associated with approximately 19.2% of the average housing rent in Pune's slums. The calculated MWTP is 653 Indian rupees, which is equivalent to approximately 6.7% of the average monthly expenditure of slum households in Pune. This is a strong premium, considering that a majority of slum residents enjoy *de facto* tenure security to some degree, as demonstrated by their fairly long average durations in their current residences. The estimated MWTP is heterogeneous, depending on a household's caste and other legal conditions.

The remainder of this paper is structured as follows. Section 2 introduces the regional background with a focus on slums in Pune. Section 3 discusses a theoretical framework that concerns the link between property rights and other tenure security factors and housing values. Simply put, this paper hypothesizes that housing rent in declared slums is higher than in non-declared slums, with a control for other characteristics. Section 4 describes the empirical strategy of this paper and explains the data and statistical models. This section develops spatial hedonic models by presenting the basic framework of hedonic analysis and a spatial econometrics model. Section 5 reports the estimation results of the models. Section 6 presents the concludes of the study.

2. BACKGROUND

Located 90 miles southeast of Mumbai, Pune is the second-largest city in the state of Maharashtra and the ninth-largest Indian city, with a population of more than three million (Government of India, 2013). Unlike landlocked Mumbai, Pune has been growing outward in a relatively monocentric form, from the old city area to the inner and outer suburbs (Corporation, 2013). The city is divided into 14 administrative wards; the municipal government (the Pune Municipal Corporation, or PMC) opens its branches in each. [2] In addition, the city of Pune consists of 76 electoral wards, from which a pair of male and female municipal councilors (municipal corporators, or *nagarsevak* in Marathi) is elected through direct election every four years. In tandem with the rapid population growth of the city, the slum population increased from 36,725 (7% of the city's total population) in 1951 to 274,000 (23%) in 1976, and to 1,050,000 (39%) in 2001 (Bapat, 2004). Currently, 5.25 square kilometers of slum area, which accounts for only 2.3% of the total area in the city, accommodate more than 200,000 households (Figure 1) (MASHAL, 2011).

Based on the Maharashtra Slum Areas (Improvement, Clearance, and Redevelopment) Act (henceforth, the Slum Act), government agencies have identified 477 slum pockets in Pune. The Slum Act defines a slum based on its poor living environment and as any area that "is or may be a source of danger to the health, safety, or convenience of the public of that area or of its neighborhood, by reason of the area having inadequate or no basic amenities, or being insanitary, squalid, overcrowded or otherwise" (Government of Maharashtra, 1971). In its planning document, the PMC describes slums in the following three categories (Corporation, 2013): The first type of slums are those located in the core city area (poor people settled in these areas back in the 18th century, and these settlements later turned to slums); slums that exist in today's inner suburb areas (as the city grew in size, migrants settled in the areas outside the core city area in order to take advantage of good employment opportunities and available vacant land. Extraordinarily huge slum agglomerations have developed in the Parvati Hill and Yerwada areas); and slums are located in the outer suburbs (where people squatted on government-owned vacant land parcels and/or near industrial and information technology (IT) growth centers).

Land ownership, land use designations, and land tenure (i.e., slum declaration status) are the main factors that constitute the legality of slum settlements. According to MASHAL (2011), 356 slums, or three-fourths of the total number of slums in the city, are located on privately owned land, while the rest stand on land belonging to local or state government authorities (84 slums, or 18%) and central government agencies (37 slums, or 8%). Although 78% of slums are located in zones designated by Pune's master plan as areas where residential activities are permissible, [3] the other slums exist in areas particularly prone to eviction and relocation, such as those along railway tracks, rivers, and on the slopes of hills.

Based on the Slum Act, government authorities have formalized some slum settlements by declaring them as slums, primarily in order to deliver basic services. In those declared slums, residents are legally protected from forced eviction without due legal process and compensation. It is well known that a vast number of buildings in non-slum settlements violate planning and building regulations. Government agencies have formalized unauthorized colonies in an inconsistent way in Delhi, Mumbai, and other major Indian cities (Anand & Rademacher, 2011; Bhan, 2009; Roy, 2009; Zimmer, 2012). Similarly, the ambiguity in the definition of a slum appears to have resulted in the ad hoc declaration of slums in Pune. Among today's 238 declared slums, the majority of them were formalized around the mid-1980s (MASHAL, 2011). The State Government of Maharashtra has suspended the declaration of new slums since 1995, except for some unique cases.

Tenure security conditions in Pune slums are mixed. On the one hand, the risk of forced eviction remains a threat to some slum dwellers. As mentioned in Nakamura (2016), 9% of the surveyed 562 households had moved to their current residences as a result of eviction from previous residences, 8% of respondents had been asked to move out of their current residence, 8% of respondents recognized litigation filed by

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