International Journal on Emerging Technologies **8**(1): 130-135(2017)

ISSN No. (Print) : 0975-8364
ISSN No. (Online) : 2249-3255

Demand for Rental Housing: A Study of Slums in Delhi

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(Received 26 December, 2016 accepted 15 January, 2017)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: Government policies have largely focused on ownership based models for addressing the challenge of low-income housing in urban India. Possibilities of rental housing, which is an important form of housing for urban poor have not been explored meaningfully. The paper estimates the demand for rental housing and its attributes in Delhi's slums using primary survey data of tenant households. Estimates of demand for rental housing attributes reveal rent to be higher for dwellings having separate kitchen, bathroom, reasonably good access to water and wider approach roads. The results show demand for rental housing to be inelastic with respect to price and income. However, rent has a greater influence on housing consumption than income. Households preferred living closer to their workplace and valued security of tenure. Policies aimed at moderating rents are likely to be more effective in enhancing housing consumption. The policy focus should also be towards improving infrastructure in the slums, their in-situ redevelopment and ensuring security of tenure.

I. INTRODUCTION

India's urban population increased from 285 million in 2001 to 377 million in 2011 resulting in an increase in urbanisation rate from 27.8 percent to 31.2 percent. It is estimated to further increase to 590 million in 2031 (Government of India, 2013). The rapid pace of urbanisation will put tremendous pressure on cities in terms of housing and infrastructure provision. A large number of poor who migrate cities in search of jobs and better livelihood are forced to live in unhygienic and inhuman conditions in rented accommodations in informal and illegal settlements. Provision of adequate shelter and housing services to such population is a daunting challenge for all levels of governments, and the problem is more acute in a country like India where the growth of slums outpaces the overall growth of cities.[i] Any housing policy for such sections of society should, therefore, be based on a careful and proper understanding of urban housing markets for these sections, as reflected by their housing demand behavior.

A number of studies have analysed the demand for housing in countries across the world (Gulyani*et al*., 2012; Malpezzi and Mayo, 1987; Mayo *et al*., 1985), but there are not many studies for India. The India specific studies are by Dholakia (1980) and Tiwari and Parikh (1998)which estimate housing demand at the national level. The city specific studies are by Mehta and Mehta (1989) for Ahmedabad; Malpezzi and Tiwari (1991) for Bangalore; Tiwari *et al*. (1999) and Tiwari and Parikh (1997) for Mumbai; and Ahmed *et al*. (2013) for Delhi. With the exception of Ahmed *et al*. (2013) which estimates the demand for housing for both slum and non-slum dwellers and also for owners and renters, none of the Indian studies have addressed issues relating to housing demand for slum dwellers. Hence, very little is known about the existence and working of housing markets in slums in India. Moreover, most of the Indian studies are quite dated. With cities in India experiencing proliferation of slums, estimates based on more recent data would be useful for designing policies for urban poor. Absence of studies analysing the demand for housing forurban poor could be attributed to the difficulty in obtaining data relating to the operation of housing markets in slums or to the apparent belief that slums are not important.

Most of the urban poor being engaged in informal sector are faced with income uncertainties due to the absence of job security. Moreover, they need to be mobile in order to respond to employment opportunities and therefore cannot afford to be rooted geographically due to home ownership. Given these characteristics of low-income households, rental housing is an appropriate housing option for them. In India, government policies for provision of housing for urban poor have traditionally focused on ownership based models without adequate concerns to the needs and capacities of such households. Possibilities of rental housing have not been explored adequately to address the challenge of low-income housing.

The only emphasis on rental housing was through the provision of subsidised rental housing for low-income employees of central and state governments. State provision of public (open) rental housing was insignificant.

The paper focuses on rental housing market for urban poor in Delhi. It estimates their demand for rental housing and contributes to the literature by providing new evidence on demand for rental housing in slums in Delhi using data from a primary survey of tenant households conducted by the authors in 2011.The paper is organised as follows: Section 2 gives a description of different types of slums in Delhi. Section 3 provides information on data used. Empirical findings are presented in section 4. Section 5 concludes by providing broad policy suggestions.

II. SLUMS IN DELHI

Delhi attracts large number of migrants from different parts of the country every year. Delhi as a city had more migrants than any other state in the country in 2011 (IIHS, 2012). A sizeable proportion of them are confined to lower socio-economic group and form the large chunk of Delhi's poor. Most of Delhi's urban poor live in over-crowded and unsanitary settlements, commonly known as slums and squatter settlements and do not have access to safe and secure shelter and basic infrastructure and services (Ahmed and Choi, 2011; Sivam, 2003).

In Delhi we have classified slums into 3 broad categories, (a) Legal slums comprising areas notified as slums under Slums Areas (Improvement and Clearance) Act, 1956. Areas notified under the Slum Act are walled city, walled city extension, and parts of East Delhi; (b) Illegal-slums consisting of encroachments on public and private lands. Squatter settlements or jhuggi-jhonpri clusters (JJ-clusters) fall under this category; (c) Areas not notified under Slum Act, nor encroached upon but unfit for human habitation due to unregulated building construction activities, lack of basic infrastructure, unhygienic living conditions etc. Urban villages and unauthorised colonies (UCs)[ii]fall under this category. We have also considered relocation and resettlement colonies, which are interventions by the government for relocating JJ-clusters, as slums. Over the years living conditions in these colonies have deteriorated considerably due to unregulated construction, inadequate infrastructure, overcrowding etc. making them unfit for human habitation. Around 49 percent of Delhi's population lives in (notified) slums, UCs and JJ-clusters.[iii]

The tenurial status, however, differ across these settlements. There is no tenure security in JJ-clusters. In notified slums majority of the households have land tenure. In UCs people have legal title to land, but this does not confer legality to the settlements as these colonies have come up in total violation of Master Plan, land use restrictions and building standards (Kundu, 2004). Residents in relocation and resettlement colonies have full tenurial security, while those in urban villages have legal title to land. Thus, if one were to consider legality of settlement in terms of legal title to land, conformity to Master Plan and land use restrictions, both JJ-clusters and UCs are not legal. However, if one considers title to land as the only criteria, then JJ-clusters are not legal. In the paper we have used the latter definition of tenurial status to classify settlements in terms of legality of tenure.

III. DATA

The data used for the empirical exercise reported in the paper are from a primary survey of tenant households living in Delhi's slums. The survey was carried out by the authors during March-June 2011 covering different categories of slums (as described in section 2) in Delhi. A total of 238 households were randomly selected from these settlements. The sampling unit of the primary survey was the household and the respondent in most cases was head of the household.

IV. ESTIMATION RESULTS

A. Demand for Housing Attributes

The model used in estimating demand function for housing in the present study is based on the pioneering work of Rosen (1974) which provides a framework for estimating demand for a single commodity with many attributes. Following Follain and Jimenez (1985), we conduct a simple first-stage hedonic form regression analyses with price of dwelling unit which is rented out as the dependent variable. As rent paid gives an observable and unambiguous measure of the value of house for tenants, we have used monthly rent per unit area as the price of dwelling.

The explanatory variables used in the analysis are clubbed into 5 groups. The first set of independent variables represent dwelling size and consists of variables: area and number of rooms. Since area and number of rooms are correlated we have used them in alternate specifications. The second set of explanatory variables capture amenities inside the dwelling. It consists of 3 dummy variables: whether the dwelling has (i) separate kitchen, (ii) separate toilet and (iii) reasonably good access to water. As the variables presence of separate toilet and reasonably good access to water are correlated, these are used in alternate specifications. The third set of explanatory variables capture neighbourhood conditions and comprise of a continuous variable width of road in front of the house and 2 dummy variables

Table 1: Determinants of Rent in the Slums in Delhi.

Dep variable: ln(monthly rent per square meter)	**1**	**2**	**3**	**4**
Unit Size				
ln(Area of dwelling unit)	-1.009***	-0.961***		
	(-9.43)	(-10.02)		
ln(No. of rooms)			-1.227***	-1.150***
			(-4.92)	(-5.09)
Infrastructure: Dwelling Unit Level				
D: Kitchen in house (Yes=1)	0.603***	0.431***	0.563***	0.393***
	(4.52)	(3.67)	(3.72)	(2.90)
D: Toilet in house (Yes=1)		1.173***		1.261***
		(7.67)		(7.20)
D: Access to Water (Yes=1)	0.353**		0.432**	
	(2.27)		(2.46)	
Neighbourhood Conditions				
D: Floor (Ground floor=0)	0.042	-0.023	0.040	-0.026
	(0.35)	(-0.21)	(0.29)	(-0.21)
D: Landlord stay in same building (Yes=1)	0.570***	0.309***	0.483***	0.215*
	(4.86)	(2.79)	(3.58)	(1.67)
ln(Width of road in front of house)	0.396***	0.235**	0.220	0.050
	(3.28)	(2.16)	(1.64)	(0.41)
Tenure of Stay				
ln(duration of stay)	-0.302***	-0.303***	-0.275***	-0.273***
	(-6.11)	(-7.17)	(-4.93)	(-5.62)
Settlement Type				
D: Tenurial Status (Legal=1)	-0.580***	-0.952***	-1.201***	-1.543***
	(-2.75)	(-5.08)	(-5.26)	(-7.53)
Constant	6.941***	6.933***	5.289***	5.360***
	(31.32)	(34.98)	(35.53)	(39.56)
No. of obs	219	219	219	219
R-sq	0.49	0.59	0.35	0.46
Adj R-sq	0.47	0.57	0.32	0.44

Notes: Figures in parenthesis refer to t-values; D refers to dummy variable.
***, **, * refer to significance at 1%, 5% and 10% respectively

(i) whether landlord stays in the same building and (ii) floor in which the dwelling is floor as base).

The fourth set of independent variables represents duration of stay in the house and of the variable: number of yearslived in the current house. The final set of independent variables is for type of settlement and comprises of a dummy variable for tenurial status. It distinguishes settlements where the residents have legal title to land from those where they do not have and hence are illegal. The hedonic function has been estimated using ordinary least squares (OLS) estimation. The independent variables are all in logarithmic form with the exception of those measured in binary scale. In all we have 4 specifications. The results are reported in table 1. Goodness of fit ranges between 0.32 and 0.57. Given that the regression analysis is based on cross-sectional data, the explanatory power of the model is reasonably good. From the specifications estimated the following conclusions emerge: Size of dwelling, represented by floor area and number of rooms, is inversely related to rent and the results are significant for all the specifications tested. Rent (i.e., monthly rent per unit area) decreases with the increase in floor area or as the number of rooms increase.

Rent is higher for dwellings having separate kitchen and the results are statistically significant. Presence of kitchen in the dwelling increases rent by about 27-60 percent. Rents are also higher for dwellings having separate toilet. The increase in rent would be in the range of 78-121 percent. Reasonably good access to water also increases rent and the results are significant.

The other variable which is significant is duration of stay in the current house. Duration of stay inversely influences rent, i.e., the longer one has lived in a particular rented accommodation relatively lower will be the rent. As rent in most cases is fixed by negotiation between the owner and the tenant, yearly increase in rent is lower for existing tenants as compared to the hike in rent for new tenants. Yearly increase in rent would be 22-30 percent lower for the existing tenants.

Rents are relatively lower in settlements where the residents have legal title to land. Ceteris paribus, rents would be lower by about 58-154 percent in such settlements. This is contrary to what one would have expected. However, one possible explanation could be that in settlements with no security of tenure owners may often have to bribe government and municipal officials (including police) for illegally occupying public land. A part of this bribe is often recovered from the tenants by charging higher rent.

A. Demand for Rental Housing

Demand for housing reflects willingness to pay for a set of housing services. It depends on household characteristics and price of the house. In estimating the housing demand function, following Ahmed et al. (2013), we have used floor area of the dwelling which represents quantity of housing demanded as the dependent variable. The explanatory variables used in the model are: (i) monthly rent per unit area. It represents price of the dwelling; (ii) income of household. We have used 2 measures of income (a) monthly income of the household which is total monthly income of all working members of the household; and (b) monthly income of head of household; (iii) attributes of head of the household. It consists of a continuous variable age of the household head and a dummy variable for educational qualification of the head; (iv) household characteristics. It comprises two continuous variables: household size and number of working members in the household. Since number of working members is correlated with income of household we have used it with the other measure of income, monthly income of household head; (v) distance of workplace of the head of household; and (vi) variable representing type of settlement. It comprises a dummy variable for tenurial status (similar to that used in previous section).

The housing demand function is estimated using the OLS method of estimation. The variables are all in logarithmic form with the exception of those measured in binary scale. The results are reported in table 2. Goodness of fit is reasonably high ranging between 0.48 and 0.54.

From the specifications estimated we find demand for rental housing decreases with the increase in rent and the results are significant. In other words, estimates of price elasticity of demand for rental housing are negative. The results further show estimates of income elasticity of demand for rental housing to be positive and significant. That is, demand for rental housing increases with the increase in income, irrespective of how we define income. However, both price and income elasticities are inelastic. Since price elasticities are higher than income elasticities in absolute terms, rent (i.e., price) has a greater influence on housing consumption than income.

Table 2: Rental Housing Demand in Delhi's Slums

Dependent variable: ln(area of dwelling unit)	**1**	**2**
ln(monthly rent per square meter)	-0.249***	-0.246***
	(-7.75)	(-7.49)
ln(household monthly income)	0.219***	
	(3.36)	
ln(monthly income of head of household)		0.167**
		(2.23)
ln(number of working members)		0.276***
		(3.34)
ln(household size)	0.033	0.030
	(0.58)	(0.54)
ln(age of the head)	0.099	0.048
	(0.85)	(0.40)
D: Tenurial Status (Legal=1)	0.579***	0.606***
	(7.36)	(7.64)
ln(distance from workplace)	0.059***	0.063***
	(2.62)	(2.79)
D: Education of Head (Graduate =1)	0.259*	0.275*
	(1.82)	(1.93)
Constant	0.684	1.260*
	(1.07)	(1.72)
No. of observations	231	231
R-sq	0.49	0.50
Adj R-sq	0.47	0.48

Notes: Figures in parenthesis refer to t-values; D refers to dummy variable.
***, **, * refer to significance at 1%, 5% and 10% respectively

This implies, despite low price elasticities, policies that reduce rents in Delhi's slums are likely to be more effective in enhancing housing consumption than those aimed at improving incomes.

The estimation results further show that as number of working members in a household increases, households tend to prefer larger dwellings and the results are significant. Households tend to prefer relatively larger dwellings as family size increases, but the results are not. The effect of age of household head is not significant. The other explanatory variables that are significant are educational qualification of household head and distance to workplace. Households headed by graduates tend to prefer relatively larger dwellings (25-27 percent more floor area) vis-à-vis those where household head is not a graduate. Also, households preferred to live closer to their workplace, even if it meant living in relatively smaller accommodation. The study also finds preference for larger dwellings in settlements that are legal and residents have legal title to land.

V. CONCLUSION

The following points emerge from the examination in this paper of demand for rental housing among urban poor in Delhi's slums: The estimation results show income elasticity of demand for rental housing to be positive and significant, i.e., households tend to prefer relatively larger dwellings as their income increases. The results further show demand for rental housing to decrease with the increase in rent implying an inverse relationship between the two. Though demand for rental housing is inelastic with respect to price and income, price (i.e., rent) had a greater influence on housing consumption than income. Therefore, policies aimed at reducing rent are likely to be more effective in enhancing housing consumption than those aimed at enhancing income. One of the ways to achieve this is to increase the supply of rental housing. For this government has to take initiatives for providing rental housing for the poor and also encourage private players in the provision of rental housing.

The paper finds rent to be relatively higher for dwellings having amenities like kitchen, bathroom, reasonably good access to water, and wider approach roads. The results further show that the surveyed households preferred to live closer to their workplace and valued security of tenure.

In India, government policies for addressing the challenge of housing for urban poor have largely focused on ownership housing. The emphasis on rental housing was mainly through the provision of subsidized rental housing for low-income government employees. Public provision of open rental housing is insignificant and attempts by the government/government agencies for providing such housing were not successful. This discouraged them in further developing rental housing and the supply of rental housing was largely left to the private sector.

However, in recent years, with the launch of schemes like Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and Rajiv Awas Yojana (RAY), the policy focus again shifted towards rental housing. JNNURM encouraged states to reform their rent control acts (RCA) and make them more market oriented while RAY aimed at improving living conditions for the urban poor through construction of housing for the economically weaker sections. One-fourth of such projects were meant for developing rental accommodation. In 2015, the government came up with the draft National Urban Rental Housing Policy which acknowledged the need for rental housing. However, the very cause of promoting rental housing was defeated with the exclusion of rental component from the purview of Pradhan Mantri Awas Yojana-Housing for All (Urban) (PMAY) which was also launched in 2015. PMAY did not have any rental housing component, although the scheme guidelines required states to legislate/amend their RCAs on the lines of model Tenancy Act. Despite growing recognition that schemes providing ownership housing are unlikely to solve the urban housing problem, government continues to focus on ownership housing.

Rental housing is an important form of housing for the urban poor. The government should not only promote rental housing but also encourage participation of all in the provision of rental housing so that the gap in the demand and supply of housing for urban poor can be bridged. A variety of rental options can be offered to such households based on their affordability. These could include among others, dormitories, hostels, one room dwelling with common/shared facilities like water connection, toilet, bathrooms etc., one/two room housing set with independent kitchen and bathroom. Moreover, such housing should be located near the work-centers like markets, construction sites, bus/train stations, industrial zones etc. which provide employment opportunities to migrants. The policy focus should also be towards improving infrastructure in the existing slums, their in-situ redevelopment and ensuring security of tenure.

Reasons for the failure of earlier rental housing schemes of the government can be ascertained and lessons from such failures would be helpful in designing new schemes. While India is still struggling to formulate policies to provide rental housing to the poor, many countries worldwide have successfully addressed these issues through both formal and informal rental housing.

Lessons drawn from their experiences could contribute towards designing rental housing policies for the urban poor.

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[i] In 2012, India's urban housing shortage was estimated at 18.78 million households of which 17.96 million (i.e., 95.63 percent) were in the low income category (Government of India, 2012).

[ii] Affluent UCs are excluded from the list of UCs considered. In the initial years UCs provided affordable housing, but over the years with the increase in land prices affordability was achieved through densification both horizontally and vertically which resulted in deterioration of environmental conditions as UCs were not provided with any kind of infrastructure by the local government or through planning process (see Kundu, 2004).

[iii] Based on a note filed by the three municipal corporations of Delhi before the Supreme Court (Times of India, 2012).