Measuring housing affordability in São Paulo metropolitan region: Incorporating location

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A B S T R A C T

This paper develops a novel measure of affordability for the São Paulo metropolitan region that combines housing costs and transportation costs, including opportunity cost associated with commuting time. The results for the 2007–2013 period indicate that the number of households spending >30% of their income on housing or 45% or more on housing and transportation costs combined has been increasing rapidly. This measure of affordability that includes transportation costs provides a broader measure of housing needs to guide housing policy in addressing housing conditions that have negative effects on individual and social welfare.

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1. Introduction

An important issue facing Brazil is a deficiency in housing. Brazilian cities at the start of the 21st century have a substantial number of sub-standard housing units, with informal land tenure and a lack of access to basic urban services. These problems afflict even Brazil’s largest and most economically productive metropolitan regions: it is hard not to associate São Paulo and Rio de Janeiro with the large favelas in which many of their residents live. This situation is the result of decades of rapid urbanization and population growth, without sufficient new housing and infrastructure construction, due in part to insufficient availability of housing finance instruments, in part to limited local government capacity, and in part to overly restrictive zoning and construction regulations (Nadalin, 2010, 2014; Moreno-Monroy & Ramos, 2015).

Brazil’s urban population grew from 18.8 million in 1950 to 161 million in 2010. In the case of São Paulo, the municipality of São Paulo grew from 2.2 million residents in 1950 to 11.3 million in 2010 while the São Paulo Metropolitan Region (R MSP) grew from 2.7 million to 19.7 million (IBGE, 2014; Secretaria Municipal de Desenvolvimento Urbano, 2014). Over the same period, the average household size declined from above 5 to 3.3, amplifying the growth in the number of households and therefore the demand for housing units (IBGE, 2014).

New construction in the formal sector did not keep up with demand. In São Paulo municipality, the number of households grew by >1 million between 1980 and 2010, increasing from 2.5 million to 3.6 million (Secretaria Municipal de Desenvolvimento Urbano, 2014). Over the same period, the number of new formal housing units launched was <800,000, according to data on new construction collected by EMBRAESP for São Paulo municipality (EMBRAESP, 2014). This means that not accounting for the attrition of the existing stock, over 200,000 households (or about a fifth of new households) had to find accommodations in the informal sector, often in substandard units lacking access to basic amenities.

The insufficient supply of housing affects both the quantity of housing services consumed by households and the price of these services, contributing to make access to basic housing unaffordable to many households. Affordability constraints have potentially large private and social costs as housing cost burdened households reduce their non-housing expenditures on basic necessities such as food and clothing, as well as their investments in health care and education. Lack of investment in health care and education can produce potentially substantial negative externalities (Bashir, 2002; Cattaneo, Galiani, Gertler, Martinez, & Titiunik, 2009).

Brazil does not currently calculate a measure of housing affordability for the overall population. The official measure for renters indicates that the share of households paying >30% of their income on rent has increased in recent years, particularly in large metropolitan areas such as São Paulo. This paper implements a new approach to identify households for whom direct and indirect housing costs consume a large share of their incomes. Such households have insufficient after-housing
incomes to avoid negative personal and social consequences. The article reviews the current measure of housing affordability included in the official housing deficit measure. The main limitation of that measure is that it only includes renters, who make up a small minority of households in Brazil. We propose a methodology to account for housing costs for owners, in the absence of indicators needed to develop a robust user cost measure (particularly house value), and to account for the costs associated with commuting.

According to our measure of housing affordability, the number of households in São Paulo Metropolitan region spending >30% of their income on housing alone increased from 1.1 to 1.6 million, or 24% of the population, between 2007 and 2013. The number of households spending >45% of their income on housing and transportation combined increased from 1.2 to 1.9 million, or 28% of the population, over the same period. Unlike past measures, ours recognizes the opportunity cost of housing faced by homeowners, who represent almost 80% of the population and are left out in the FJP measure. We also recognize that two physically identical houses in different locations are very different, and that in equilibrium, their affordability should be compared taking into account differences in transportation costs.

This study contributes to the literature on location affordability indicators (CTOD and CNT, 2006; Mulliner & Mialiene 2011; Zheng, Liu, & Sun, 2011; Vidyattama, Tanton, & Nepal, 2013; Isalou, Litman, & Shahmoradi, 2014; HUD, 2014) by including within the measure of commuting cost the opportunity cost associated with travel time as estimated by hourly wages, consistent with the standard urban economic model (Alonso, 1964; Mills, 1967; Muth, 1969). It also contributes to the literature on housing needs indicators in Brazil and in other emerging countries (Angel, Mayo, & Stephens, 1993; Flood, 1997; Monkkonen, 2002; de Miranda–Ribeiro, de Mattos Viana, & Salis, 2013). Section 1 briefly reviews the existing measures of housing needs used in Brazil and their limitations with regard to measuring housing affordability. Section 2 reviews the literature used to ground the development of a location affordability indicator that incorporates the time value and monetary cost of travel. Section 3 presents the data and the methodology used to develop a housing and transportation cost affordability index for the São Paulo Metropolitan Region, and Section 4 concludes by discussing possible policy implications and limitations of the proposed measure.

2. Housing affordability as part of the measure of housing deficit in Brazil

An extensive literature in housing economics establishes the existence of negative individual and social costs associated with poor housing conditions (Rohe, Van Zandt, & McCarthy, 2013). This study is an attempt to propose a robust and stable measure of housing affordability that can be integrated to a broader measure of housing needs and used to track evolutions over time in the context of an emerging country. Housing affordability is a policy issue when households are not merely able to consume a large share of their income on housing services, but rather are, because of constraints, forced to spend a large share of their income on housing related expenditures. In addition, households spending more than a certain share of their income on housing induced expenditures have been shown to experience negative outcomes, as they are forced to spend less on education and health, among other services, resulting in decreased human capital and productivity (JCHS, 2015). A number of affordability constrained households also experience housing deficiencies, such as houses made of non-durable materials, which lack access to basic infrastructure services (water, electricity, sewer) and are more overcrowded. Households who live in overcrowded conditions have been shown to have worse health, employment and children educational outcomes (Bashir, 2002; Cattaneo et al., 2009; Krieger & Higgins, 2002; Evans, 2006). The lack of formal affordable housing also contributes to the development of informality. Households who lack proper title to their house or the land on which it is built face uncertainty and pay a cost for protection, at maximum they spend some time to defend it. This negatively affects their economic productivity (Brueckner & Lall, 2014; Galiani & Schargrodsky, 2010; Lall, Wang, & Da Mata, 2007). In addition, they have a limited access to credit (De Soto, 1990, 2003), and informal settlements have been shown to have a negative impact on surrounding housing values (Nadalin, 2010).

A number of indicators have been developed to measure housing needs in Brazil. An official measure of the “housing deficit” and inadequate housing was developed in the mid-1990s by the Fundacao Joao Pinheiro (FJP) for the Ministry of Cities, with support from the United Nations Development Program and from the Inter-American Development Bank (FJP, 1995, 2002, 2013). FJP regularly calculates housing needs estimates for Brazil, individual states, metropolitan regions and municipalities. In the state of São Paulo, Fundacao SEADE has developed its own measure of housing needs based on surveys and administrative data (SEADE 2010). Other measures have also been developed by researchers at IPEA, reproducing the work of the Fundacao Joao Pinheiro (Furtado, Lima Neto, & Krause, 2013) or discussing alternative measures (Gonçalves, 1998; de Azevedo & Araújo, 2007; de Miranda–Ribeiro et al., 2013).

The first estimate from FJP was released in 1995 based on the 1991 census and then regularly updated using decennial census and annual data from the Pesquisa Nacional por Amostra de Domicílios (PNAD) (FJP, 1995, 2002, 2013). FJP broke down the concept of housing needs into housing deficit and housing inadequacy. Housing affordability is part of the definition of the housing deficit.

The deficit concept aims to capture households living in conditions that can only be solved through building a new unit, either because the physical structure of the unit cannot simply be improved, but requires replacement, or because the living conditions within the unit are deemed substandard. There were originally two components to the deficit: 1) households living in housing units that were improvised (not designed for residential purposes) or “rustic,” defined as those with walls made of non-durable materials; 2) households with more than two families cohabitating or living in tenements (comodos). The housing affordability component was added later as a third component. That component is defined as rental households spending >30% of their incomes on rent, restricted to incomes up to 3 minimum wages. Finally, a fourth component that captures overcrowded units, defined as rental households with more than three persons per bedroom, was added to form the current definition of the housing deficit. Housing inadequacy includes housing units with physical deficiencies, such as an inadequate roof, absence of a bathroom, absence of sanitation, or absence of other basic infrastructure (electricity, water canalization, sewer or septic tank, garbage collection). Houses without property title are also considered inadequate, as are owner-occupied houses with more than three persons per bedroom (Nakano, 2010). This paper focuses on the definition of the housing affordability component of the measure of housing deficit and proposes changes to improve its ability to capture affordability constraints for owners and based on location.

3. Literature: housing affordability

Housing affordability measures based on expenditure ratios such as median price to median income and median rent to median income ratios have been developed at the national and regional level to track the evolution of market fundamentals (Hulchanski, 1995; Green, 1996; Bogdon & Can, 1997). These measures make it possible to identify whether a market is becoming more or less affordable and whether the median household in this market is housing cost burdened. These measures capture the share of income spent on housing related expenditures by median income households, and housing is deemed unaffordable if households spend more than a certain
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