

The Urban Structure of the São Paulo Metropolitan Region:
A Spatial Quantitative Approach

A Estrutura Urbana da Região Metropolitana de São Paulo:
Uma Abordagem Quantitativa Espacial

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Abstract

In recent years, the literature on quantitative urban models has experienced significant growth, with contributions such as Ahlfeldt et al. (2015), Heblich et al. (2020), Tsivanidis (2023), and Redding and Sturm (2024), among others. This literature develops general equilibrium models whose equations closely match administrative data from national and local governments and incorporates real geographies rather than stylized ones, such as those used in earlier works (e.g., Lucas and Rossi-Hansberg, 2002).

Much of this literature focuses on cities in the developed world, with relatively fewer studies examining cities of developing countries. This gap represents an avenue for research, given the relevance of this modeling approach for analyzing public policies and urban challenges that are characteristic of developing economies. One such challenge is informal housing.

Alongside this strand of research, the literature on informal housing has also advanced significantly over the past two decades – Cavalcanti, Da Mata and Santos (2019), and Ferreira, Monge-Naranjo and Pereira (2025) are examples centered on Brazil. This literature analyses the causes, persistence, and consequences of informal housing and slums in urban areas, employing a variety of modelling approaches, ranging from causal inference to general equilibrium and simulation. Some studies investigate the spatial location of slums, typically assuming stylized urban structures.

This study develops a quantitative urban model centered on the São Paulo Metropolitan Region, the largest urban area in Brazil and one of the most populous metropolises in the world. The model explicitly incorporates informal housing and its spatial distribution within the metropolis, a key feature of the Brazilian urban environment – nationwide, 7.99% of the urban households were informal as of 2010

(Cavalcanti, Da Mata, Santos; 2019). Since income inequality is one of the main drivers of informal housing and slum formation, it is also explicitly modelled. The framework is designed to allow for counterfactual analysis of public policies and local interventions. Census and administrative data are readily available for the 39 municipalities that compose the metropolis.

This study contributes to the literature on quantitative urban models by focusing on an urban area in Brazil, a country for which no published studies currently exist in this field. A further contribution is to explicitly model informal housing within a real geographic setting in the context of a developing country.

JEL Codes: C68, R12, R13, R14, R21, R23, R28, R31.

Key-words: quantitative urban model, general equilibrium, informal housing, slums.