

Commuting patterns in the metropolitan region of Rio de Janeiro. What differences between formal and informal jobs?



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ABSTRACT

Limiting commuting trips in major cities is important from the environmental, social and economic standpoints. In order to design policies that aim to change commuting practices it is, however, necessary to have acquired a good understanding of the trips in question and their determinants. However, these trips have been subjected to very little study in the cities of developing countries. This paper is concerned with the Rio de Janeiro Metropolitan Area (RJMA), and sets out to test the influence of “classical” socioeconomic and spatial variables on the distance and duration of the commuting trips of the region's inhabitants, especially those with the lowest incomes. The main original feature of this research is that it includes jobs in the informal sector. The results show that, all other things being equal, commuting distances and times are shorter for the informal sector, and people walk more from their homes to their place of work because jobs in the informal sector are more dispersed than jobs in the formal sectors. The notable exception is personal and household services for which employees (who are mainly women) live a long way from the city center where wealthy families (and their jobs) are concentrated.

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1. Introduction

Reducing commuting distances and duration in major cities is important from the environmental, social and economic standpoints (Givoni and Banister, 2013). The pressing need to reduce greenhouse gas emissions means we must greatly reduce the daily distances traveled by automobile. This can only be achieved by reducing the distance between residential locations and jobs and/or increasing the use of alternative modes of transport (Åkerman and Höjer, 2006; Holden, 2012; Modarres, 2013). The social challenge is to ensure that the lowest income groups have access to jobs at costs which are acceptable not only in financial terms but also in terms of daily travel times (Lau, 2011; Lucas, 2011; Motte-Baumvol and Nassi, 2012; Naudé, 2008; Yongling and Guonan, 2009). Last, the efficiency of commuting trips is a factor for firms' economic efficiency (Cervero, 2001), in particular because it reduces stress and fatigue among the workforce (Novaco and Gonzalez, 2009).

In order to design policies that aim to change commuting practices it is, however, necessary to have acquired a good understanding of the trips in question and their determinants. However, these trips have been subjected to less studies in the cities of developing countries (Garske et al., 2011; Gutiérrez-i-Puigarnau and Van Ommeren, 2010;

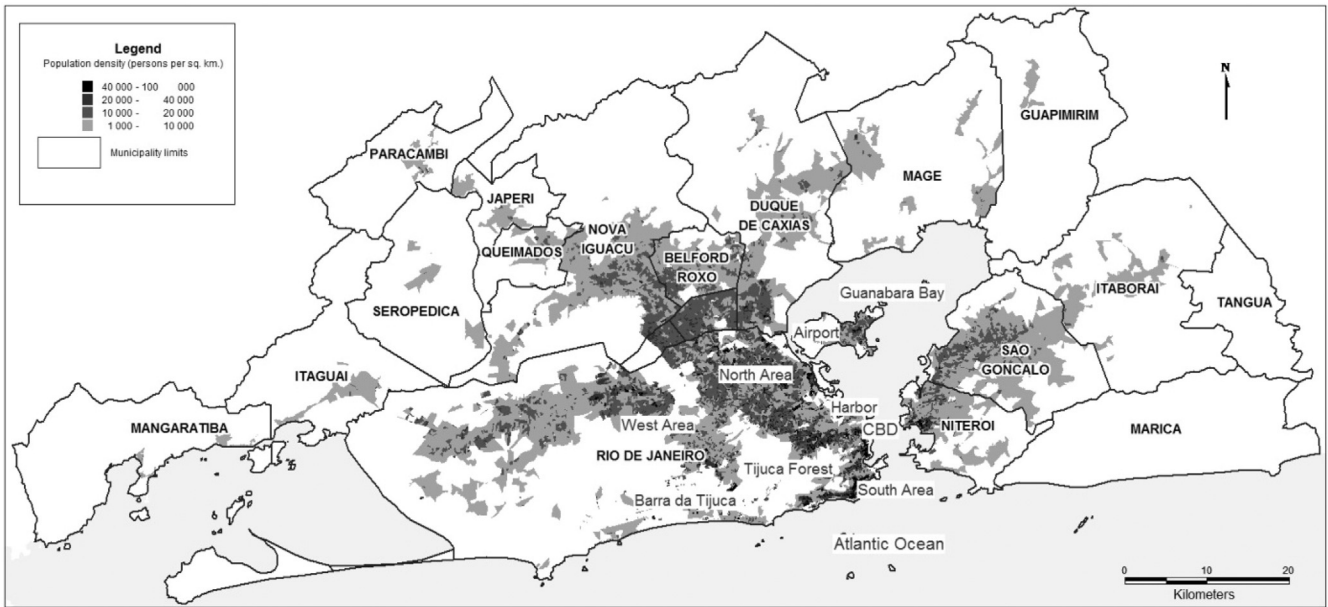
Punpuing, 1993; Salon and Gulyani, 2010; Shirgaokar, 2014). We have, in particular, only scant knowledge of the influence of the variables responsible for the differences between individuals in industrialized countries, for example income levels, gender, the type of job or residential location (Aguilera, 2005; Giuliano and Small, 1993; Shearmur, 2006).

This paper is concerned with the Rio de Janeiro Metropolitan Area (RJMA), and sets out to test the influence of “classical” socioeconomic and spatial variables on the distance and duration of the commuting trips of the region's inhabitants, especially those with the lowest incomes (Fig. 1). In particular, we wish to test the hypothesis of a spatial mismatch (Kain, 1968; Holzer, 1991) between residential and work locations on the grounds that, in this Metropolitan region as in other Latin American cities, jobs are very highly concentrated in the Central Business District (CBD) and a few pericentral employment areas (Fernández-Maldonado et al., 2013). However, in recent decades the population, particularly the lowest income households, has moved out into the urban periphery (Rodríguez Vignoli, 2008; Ribeiro and Lago, 1995). Commuting distances have greatly increased, and commuting times even more so (Pereira and Schwanen, 2013). Commuting times are higher for modest inhabitants of the municipalities of the north RMJA (Fig. 2), highly dependent on employment centers from the municipality of Rio de Janeiro (CENTRAL, 2005).

Apart from the fact that it is concerned with a little-studied area, the main original feature of this research is that it includes jobs in the informal sector. This accounts for 55% of the jobs in Rio de Janeiro (Ramos

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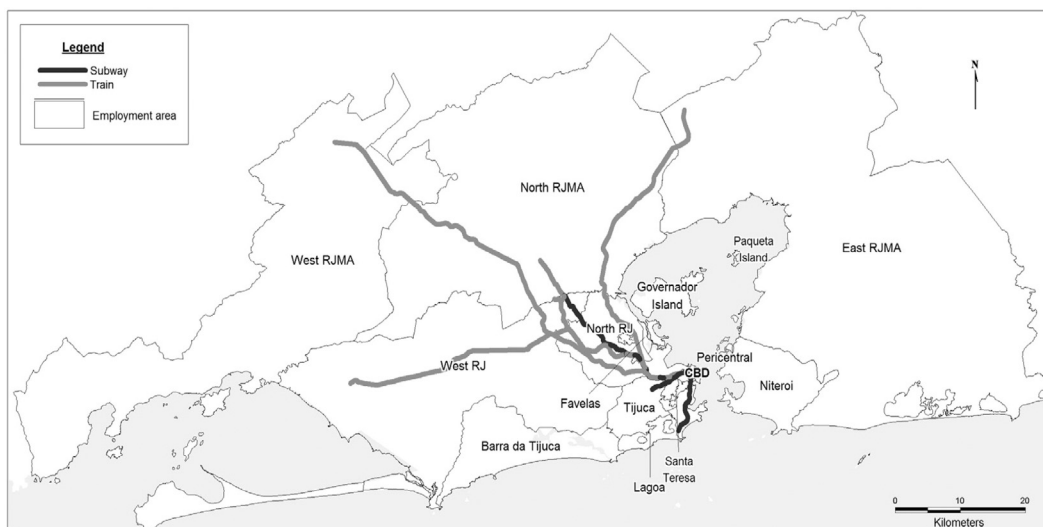
Source: Cartography by the authors from the National Population Census 2000

Fig. 1. Population densities in the Rio de Janeiro Metropolitan Area (RJMA).

and Ferreira, 2006) and these jobs are mainly held by individuals with the lowest incomes (Jonasson, 2011; Bargain and Kwenda, 2011). These jobs are more dispersed than formal sector jobs, which has the potential to mitigate any spatial mismatch. Moreover, the issue of the difference in terms of travel between formal and informal jobs has received little attention in the literature (Abane, 1993; Mitra, 2005). However, informal jobs have the potential to greatly reduce travel distances not only because the workers have to pay the entire cost of transport (which does not apply in the formal sector), but also because of the precarious nature and low remuneration of informal jobs (Bargain and Kwenda, 2011). A. Abane (1993) showed that in Accra (Ghana) many informal workers, and particularly the female traders, prefer to live close to their business in order to reduce commuting costs but also because this is a way to ensure the safety of their wares. In India, A. Mitra (2005) highlighted that women in the informal sector are constrained to choose a job close to their homeplace (which location is determined

by their husband) firstly because of household responsibilities and secondly because they can access jobs only to informal contacts in their neighborhood.

This paper therefore sets out to identify the factors that influence the commuting distances and times among the residents of the Rio de Janeiro Metropolitan Area, distinguishing between formal and informal jobs. Section 1 consists of a literature review. Section 2 presents the data we have used and describes the locations of the jobs and the residences of workers in the RJMA. Section 3 defines the informal jobs. Section 4 describes two linear regression models, one for commuting distance and the other for travel time. The findings are summarized in the conclusion. The results show that, all other things being equal, commuting distances and times are shorter for the informal sector, and people walk more from their homes to their place of work because jobs in the informal sector are more dispersed than jobs in the formal sectors. The notable exception is personal and household services for which employees



Source: Cartography by the authors

Fig. 2. Zoning of the RJMA and railway lines.

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