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Access to jobs and apartment rents

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ABSTRACT

This study empirically explores the relationship between access to jobs and apartment rents. Specifically, the research examines the following three hypotheses: job accessibility positively influences apartment rents, the effect of job accessibility on apartment rents varies by transportation mode, and the effect of job accessibility on apartment rents varies by rent level. To examine these hypotheses, this study applies gravity-type job accessibility indexes based on a study sample of 7077 observations in the Taipei Metropolitan Area, Taiwan, from the year 2009. The sample data are analyzed using linear and quantile regressions. The empirical evidence confirms the positive effect of job accessibility on apartment rents, and its variability depending on the transportation mode and rental level. The effect of job accessibility on apartment rent is significantly positive in the median or lower-rent-level sub-markets, but insignificantly negative in higher-rent-level sub-markets. Job accessibility by motorcycle and public transit has a higher positive influence on rent than accessibility by car. These findings provide new knowledge on the role of access to jobs in explaining apartment rents, and reveal a fresh policy direction on rental subsidy programs for lower-income workers living in cities.

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1. Introduction

"Job accessibility" refers to the convenience of travelling between residence and employment. Improvements in job accessibility can increase employment opportunities (Sanchez et al., 2004), weekly working hours (Sanchez, 1999) and salary (Åslund et al., 2006; Lin et al., 2014), and reduce commuting time (Lin et al., 2014; Wang, 2000; Wang and Chai, 2009) for workers. Therefore, residing in a place with good access to jobs is important for economically disadvantaged individuals (EDIs) to sustain their employment, and even to lift themselves out of poverty, thus preventing transport-related social exclusion (Preston and Raje, 2007). However, EDIs often have low housing affordability and, thus, have very limited options for housing location and fewer opportunities for owning houses. Many nations provide rent subsidy to EDIs to improve their housing affordability as a social welfare program. Most rent subsidy programs, such as that implemented in Taiwan (Construction and Planning Agency, 2014), calculate the rent subsidy according to an EDI's socio-economic conditions, without considering house locations, even though location is generally a major determinant of housing cost. Given that better job accessibility benefits the employment of EDIs, welfare programs must consider linking rent subsidies to the job accessibilities of house locations. Assessing this consideration requires clear information about the relationships between job accessibility and house rents.

However, the existing literature provides no information about the relationships between access to jobs and house rents. When selecting explanatory variables, previous house rent studies (e.g., Benjamin and Sirmans, 1996; Guntermann and Norrbin, 1987; Jaffe and Bussa, 1977; Lin, 1993; Marks, 1984; Sirmans et al., 1989; Valente et al., 2005; Wilson and Frew, 2007) have identified many determinants of house rent, including dwelling attributes (e.g., rental area, building age, floor), facilities and services (e.g., parking, laundry, security), and proximity to a specific transport system (e.g., freeway access or transit station) or a specific location (e.g., central business district), but ignored job accessibility. Conversely, some studies have explored the effect of job accessibility on house prices (Adair et al., 2000; Du and Mulley, 2012; Osland and Thorsen, 2008; Osland and Thorsen, 2013) and land prices (Giuliano et al., 2010; Goffette-Nagot et al., 2011), but not house rents. These property price studies all adopted gravity-type indexes to measure a location's accessibility to all employment opportunities within a region in Belgium, Norway, UK, or the US. They mostly observed a positive relationship between job accessibility and property prices, and some of them found differences in the relationships among different sub-markets and accessibility measures.

Although house rents should be associated with house prices, numerous studies have argued that house rents have significantly different determinants in relation to house prices. For example, the Taiwan study of Peng (2004) reported that house rents are significantly explained by household size, house price, house stock, and expected capital gain, but house prices are significantly explained by household income, house rent, housing market, expected capital gain and vacancy rate. That study also found that expected capital gain is positively

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related to house prices but negatively related to house rents. The US study of Potepan (1996) found that the effects of property tax rate and change in population are contrary between house prices and house rents. Moreover, household income, population, quality of public services, crime rate, air pollution, climate, and non-housing price significantly affect house rents but insignificantly affected house prices. Given that the knowledge about house prices cannot be confidently transferred to studies on house rents, the relationship between access to jobs and house rents is worthy of further exploration so as to help making policy decisions on house rent subsidy.

The current study empirically examines the relationships between access to jobs and apartment rents. The study sample comprised 7077 observations in the Taipei Metropolitan Area, Taiwan in 2009; data were analyzed using linear regression and quantile regression methods. The empirical evidence presented in this study contributes to the literature in the following ways. First, the current study provides novel evidence of the relationship between job accessibility and apartment rents. To the best of our knowledge, such evidence does not exist in previous research. The present study uses disaggregate measures of accessibility, as opposed to measures of proximity to a single location or feature, and employs a measure of generalized cost to provide a richer description of ease of access to jobs. Second, this study applies quantile regression method to discriminate among the job accessibility influences on apartment rents among different rent-level sub-markets. This approach categorizes observations into different rent groups and then estimates regression coefficients for every group via a single regression analysis. This approach is more efficient and valid than those used in previous sub-market studies. Third, this study measures job accessibility by three transportation modes, namely car, motorcycle, and public transit, and identifies different effects among these transportation modes. Riding a motorcycle is a popular commuting mode for general workers in Taiwan and southeastern Asia, while it has been commonly ignored in research on job accessibility in western societies.

2. Method

This study defines the outcome variable as the monthly asking rent per Pin for an apartment. The Pin is a Taiwanese area unit, approximately equal to 3.3 square meters. Table 1 lists the definitions of explanatory variables and their hypothetical relationships with apartment rents, as discussed below.

2.1. Job accessibility

The "access-space-trade-off" model of Alonso (1964) has long been considered as a theoretical basis of the positive relationship between job accessibility and housing cost. This model assumes that all jobs are located in a city center, and that job accessibility is represented by the distance from one's location to this city center. However, given that the phenomena of multiple workers in a household and multiple employment centers in a city have become increasingly common, recent empirical research on the relationship between access to jobs and housing costs have adopted synthesized indexes to represent the accessibility to multiple locations of job opportunities in their study regions. For example, Adair et al. (2000) analyzed sample data in the Belfast Urban Area, Northern Ireland, and concluded that accessibility is of little significance in explaining variation in house prices at a city-wide scale, but can be important at a sub-market level, especially in lower-income areas. Osland and Thorsen (2008, 2013) studied property transactions in southern Rogaland, Norway, and confirmed that labor-market accessibility has a positive effect on house prices. By using spatial regression analysis, they also discovered the negative externalities of house prices that are close to areas of high labor market accessibility. Giuliano et al. (2010) explored parcel transaction data in the Los Angeles region, US, and found that accessibility to all jobs positively affects land prices, and that the accessibility effects on land prices depends significantly on the price level. Meanwhile, Goffette-Nagot et al. (2011) examined average land prices of communes in Belgium and concluded that the accessibility of employment positively influences land prices in the same linguistic region. Du and Mulley (2012) conducted a house price study in Tyne and Wear, UK, and concluded that, on average, house prices increase with car travel time to city center, but decreased with increasing public transport travel time to employment. They also found by spatial regression analysis that the influences of accessibility on house prices are spatially diverse.

These previous studies generally confirm that access to job positively influences house or land prices. However, whether this positive influence also happens with house rents needs to be addressed. Based on the studies of rent-price (e.g., Davis et al., 2008) and price-rent (e.g., Chen, 1996) ratios, house rents should be associated with house prices, and their associations should change with house market developments. Excessive housing investment demands and speculative ventures in a real estate market are the major reasons behind the increased price-rent ratios (Tseng et al., 2005), and house rents further properly represent the values of housing consumption. Furthermore, numerous studies, such as Lin (1993), Peng (2004) and Potepan (1996), argued that changes and determinants of house rents are significantly different from those of house and land prices. Consequently, the question of whether job accessibility influences house rents has not been clearly answered yet. To answer this question with the focus on the apartment market, this study proposes the first hypothesis as follows:

H1. Job accessibility positively influences apartment rents.

Table 1
Definitions of study variables and hypothetical relationships with apartment rent per unit area.

Variables	Definitions	Units	Hypothetical relationships[a]
Job accessibility			
A_i^c, A_i^m, A_i^p, A_i^g	As in Eqs. (1)–(4).	–	+
Controls			
Studio	A rental unit is (=1) or is not (=0) a studio.	–	+
Room	A rental unit is (=1) or is not (=0) just a bedroom, with bathroom, kitchen and other living space shared with other renters.	–	+
Elevator	A rental unit is (=1) or is not (=0) in a complex equipped with elevators.	–	+
Kitchen	A rental unit has (=1) or has no (=0) kitchen.	–	+
Ground Floor	A rental unit is (=1) or is not (=0) located at the first floor.	–	+
Upper Floors	A rental unit is (=1) or is not (=0) located at the sixteenth floor or higher.	–	+
Area	Rental area.	Pin (3.3 m^2)	−
Age	Building age.	Year	−
Arterial	The shortest travel distance from a rental unit to the nearest arterial road.	Meter	−
Bus Stop	The shortest travel distance from a rental unit to the nearest bus stop.	Meter	−
Rail Station	The shortest travel distance from a rental unit to the nearest rail station.	Meter	−

[a] + denotes positive effect, − denotes negative effect.

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