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Rail-transit-induced gentrification and the affordability paradox of TOD

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ABSTRACT

Numerous studies have shown that rail transit has a positive effect on raising property values and tax revenues. Such an effect is widely viewed as an economic benefit for property owners and is key to justifying the high cost of building rail transit infrastructure. In recent years, however, concerns have been raised about rail transit acting as a gentrification trigger and causing the affordability paradox. In this study, I evaluate whether rail transit in suburban Portland caused neighborhood gentrification and reduced home affordability through a longitudinal quasi-experimental design. I use the propensity score matching method to identify control neighborhoods for rail-transit-served neighborhoods. I then make pretest-posttest comparisons between rail-transit-served neighborhoods and their control neighborhoods at multiple observation points. In general, I did not find consistent evidence for rail-transit-induced gentrification in suburban Portland. I did not find evidence that rail transit reduced home affordability for tenants and home owners in rail transit-served neighborhoods either. I observed more changes in the neighborhoods served by the Eastside line (the oldest rail transit line in Portland) than their control neighborhoods in the past three decades: socially, they attracted older and less-educated population; physically, they experienced densification and faster increases of the share of rental units in their housing stock. Rail transit was more likely to be installed along low-income neighborhoods in suburban Portland, confirming the necessity of constructing appropriate control neighborhoods while evaluating the neighborhood and social effects of rail transit.

1. Introduction

Transit-oriented development (TOD) has gained wide and ongoing popularity with the quick expansion of rail transit systems in American cities in the past few decades. Numerous studies have shown that TOD can promote economic development and increase nearby property values by improving transportation accessibility and offering more livable environment (Ahlfeldt and Wendland, 2009; Duncan, 2011; Gibbons and Machin, 2005). In the literature, TOD's positive effects on property values and tax revenues are widely viewed as an economic benefit and are key to justifying the high cost of building rail transit infrastructure (Smith and Gihring, 2006; Cervero and Duncan, 2002). In recent years, however, concerns have arisen about rail-transit-induced gentrification: a phenomenon whereby the provision of rail transit service and associated investment in station areas cause lower-status neighborhoods change to higher-status ones (Freeman et al., 2015; Kahn, 2007; Talen et al., 2015). One consequence of rail-transit-induced gentrification is the displacement of low-income households by middle- and high-income households and thus an affordability paradox of TOD (Renne et al., 2016), which in this study refers to a phenomenon that low-income households which would benefit from additional accessibility provided by upgraded transit are forced to move by rising rents and housing costs. Furthermore, because minority, low-income households tend to own fewer cars and use transit more often, the displacement effect of TOD may undermine its promise of increasing transit ridership (Pollack et al., 2010).

The social and neighborhood effects of public transit did not attract much attention in the literature until recently. A handful of existing studies have yielded mixed and often contradictory findings (Fan and Guthrie, 2012a, 2012b; Glaeser et al., 2008; Grube-Cavers and Patterson, 2015; Immergluck, 2009; Kahn, 2007; Pollack et al., 2010). At a time when many government agencies in the US have built or are building rail transit systems, developing a better understanding of the social and neighborhood effects of rail transit is critical to crafting more effective and equitable transportation and land use policies (Zuk et al., 2015).

In this study, I explore the social and neighborhood effects of rail transit in suburban Portland, Oregon through a longitudinal quasi-experimental design. I use the propensity score matching method to identify control neighborhoods for rail-transit-served neighborhoods and make pretest-posttest comparisons between the treatment and control groups at multiple observation points. The purpose is to examine whether rail transit caused gentrification and reduction of home affordability in nearby neighborhoods. In general, my analyses have not

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provided consistent evidence for rail transit acting as a gentrification trigger and causing the affordability paradox in rail-transit-served neighborhoods in the suburban Portland. I observed more significant changes in the neighborhoods that are served by the oldest rail transit line, suggesting that the social and neighborhood effects of rail transit take time to become apparent. The socioeconomic conditions in rail-transit-served neighborhoods were initially very different from typical neighborhoods in the region, confirming the necessity of constructing appropriate control neighborhoods when evaluating the social effects of rail transit.

The article opens with a brief review of related literature. The next section introduces my research design. The results of my analyses are then presented. In closing, I summarize and discuss the major findings of this study and suggest future research avenues.

2. Literature review

2.1. Defining and measuring gentrification

Studies of neighborhood change began with preoccupations about neighborhood decline and disinvestment. Traditional theories of neighborhood change, such as Burgess's (1925) invasion-succession model and Hoyt's (1939) filtering model, emphasize the downward movement of urban neighborhoods: higher-income residents begin to move out, usually to locations farther out from city centers, when neighborhoods age, deteriorate, and become obsolete (Wei and Knox, 2014; Skaburskis and Nelson, 2014). In the past few decades, research of neighborhood change has evolved into concerns about gentrification, a class-based phenomenon whereby low-income households are displaced by middle- and high-income households in combination with the reinvestment of the built environment (Clark, 2005, p. 258; Freeman et al., 2015; Skaburskis and Nelson, 2014; Zuk et al., 2015). Contemporary gentrification has become increasingly complex and may take a variety of forms (Davidson and Lees, 2005). Gentrification is no longer restricted to disinvested neighborhoods in inner cities. Recent studies have used the term of “gentrification” to describe upgrading in neighborhoods that have already experienced earlier rounds of gentrification and in neighborhoods that are in suburban and rural areas (Davidson and Lees, 2005; Landis, 2016).

Researchers have identified and measured gentrification in a variety of ways. Landis (2016) identifies four basic factors that can be used to measure neighborhood changes: 1) aggregate sociodemographic and economic characteristics of neighborhood residents and businesses; 2) physical, occupancy, and financial characteristics of the building stock; 3) specific number and characteristics of neighborhood newcomers; and 4) physical and capital investment flows into and out of neighborhoods. A large majority of prior studies have relied on the first two factors to measure gentrification because relevant Census data are readily available. Researchers tend to conclude that gentrification occurred when they observe a significant increase of residents of one or more of the following characteristics in a neighborhood: White, young, well-educated, middle- or high-income, living in small families, and in professional or management occupations (Atkinson, 2000; Landis, 2016; Freeman, 2005; Freeman et al., 2015; Hammel and Wyly, 1996; Hwang, 2016; Skaburskis, 2012; Skaburskis and Nelson, 2014; Walks and Maaranen, 2008). Prior studies usually describe the physical form of gentrification as the updating of aged buildings, increases of rents and home values, and tenure-switching from renting to owning (Hammel and Wyly, 1996; Immergluck, 2009; Kahn, 2007; Lin, 2002; Skaburskis and Nelson, 2014).

2.2. Rail-transit-induced gentrification and unaffordability

Transportation investment is inherently spatial and inevitably yields costs and benefits that vary across different neighborhoods (Farber et al., 2014; Golub and Martens, 2014). When a new rail transit line is built, changes are expected to occur in nearby neighborhoods as residents respond to the redistribution of transportation accessibility within the region. The impacts of rail transit on travel and land development are well documented (see Transit Cooperative Research Program [TCRP], 2004 and TCRP, 2008 for a detailed review). It is, however, far from clear whether rail transit causes gentrification and unaffordability in nearby neighborhoods. A limited number of existing studies have yielded mixed or even contradictory findings.

On the one hand, there is evidence that transit-served neighborhoods are more attractive to lower-income households who own fewer vehicles. Low-income households living close to rail transit stations can take the cost-saving benefit of transit by spending less on owning and using private cars (Dong and Hansz, 2016; Hamidi et al., 2016). The results of the National Household Travel Survey and many regional travel surveys consistently show that households with lower incomes and fewer vehicles are much more likely to use public transit than wealthier households (Giuliano, 2005; Olaru et al., 2011; Pucher and Renne, 2003; Thompson et al., 2012). Public transportation plays an important role in explaining why the poor live in American central cities: compared with automobiles that cost a lot to purchase and use, public transit offers a time-intensive alternative that is more appealing to those with low incomes (Glaeser et al., 2008). Therefore, rail transit may have the effects of attracting and retaining low-income households in nearby neighborhoods.

On the other hand, the provision of rail transit, especially in suburban areas, aims at recapturing middle-class, car-owning travelers as means of fulfilling broad social and environmental goals (Giuliano, 2005). It is argued that alternative neighborhoods that feature transit service and new urbanist design are undersupplied in U.S. metropolitan areas due to regulatory barriers (Levine et al., 2005; Levine and Frank, 2007). Transit-oriented neighborhoods are thus expected to attract the middle-class households who prefer to drive less and live in a compact, mixed-use neighborhood. Numerous studies show that better transit service leads to quicker housing appreciation in nearby neighborhoods (Ahlfeldt and Wendland, 2009; Duncan, 2011; Gibbons and Machin, 2005; Lin, 2002; Immergluck, 2009).

Empirical studies that directly examine whether rail transit causes gentrification and home unaffordability are very limited. Kahn (2007) uses a 14-city census tract–level panel data set to document the effects of rail transit expansions on communities nearby new stations. He finds that two of 14 cities (Boston and Washington D.C.) stood out in terms of gentrification effects of rail transit. He also finds that communities receiving increased access to new walk-and-ride stations experienced greater gentrification than communities that were close to new park-and-ride stations. Pollack and colleagues examine changes of income and housing cost in rail-transit-served neighborhoods in 12 metropolitan areas between 1990 and 2000, finding that both income and housing cost grew faster in rail-transit-served neighborhoods than they did in typical neighborhoods in the region (Pollack et al., 2010). A study in three large Canadian cities (Toronto, Vancouver, and Montreal) shows that proximity to rail transit had a significant gentrification effect in Toronto and Montreal, but not in Vancouver (Grube-Cavers and Patterson, 2015). Fan and Guthrie (2012a) quantify neighborhood changes in four rail and bus-rapid-transit corridors in the Twin Cities metro area. Their analyses find that younger workers increased faster in the four transit corridors than in the transit-served area as a whole, but the changes of the employment structure measured based on monthly wages were mixed. Fan and Guthrie (2012b) also explored residents' and businesses' perceptions of neighborhood social changes in the four transit corridors through questionnaire surveys. Their survey results show that both urban and suburban corridor residents expected positive neighborhood changes from new transit service, and urbanites tended to report slightly more positive perceptions.

In summary, the vast majority of gentrification literature has focused on individual and private actors and capital, and much fewer studies have addressed the role of public investment, and more