

Trains to Graduations: Causal Evidence on Transit-induced Graduate Gentrification in Tokyo

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1. Introduction

In a world where urban landscapes constantly evolve, understanding where young, educated professionals choose to settle is increasingly important. In this study, we investigate the intriguing phenomenon of "graduation gentrification" – the concentration of university graduates in areas with high transportation density – and delve into the complex relationship between transportation options and the spatial distribution of this highly skilled population. University graduates considerably are associated to the socio-economic fabric of cities, impacting local economies, cultural scenes, and public amenities (Glaeser and Resseger, 2010; Becker and Murphy, 1992; Combes et al., 2008). If these individuals concentrate in developed areas, the skilled workforce and associated income increases would also be predominantly focused in the city center.

To take a closer look at how transportation density encourages graduation gentrification, we chose Tokyo, which has a well-developed transportation system, as our study area. Most research up to now has focused on developing regions; thus, examining regional disparities within a fully developed region like Tokyo is noteworthy. Although Tokyo boasts an extensive transportation system, it is crucial to ensure that this system serves all residents, regardless of income or social status. Therefore, we also investigate whether a heterogeneity in the relationship between transportation density and the concentration of university graduates in Tokyo persists. Our findings offer valuable insights into the preferences of university graduates and the factors that influence their residential choices, with implications for urban planners, policymakers, and transportation authorities.

2. Methodology

We extend the model from Lin et al. (2022) by including railway density index:

$$\ln G_{it} = \beta_1 \ln(\text{RailDensity}_{it}) + \beta_2 \ln(\text{StationDist}_{it}) + \delta_r + \delta_t + \varepsilon_{it},$$

where G_{it} is the graduation gentrification index at town i in year t . We applied university graduate rate from the population census as a main dependent variable, and examine whether similar trend can be seen when using additional variables. The main independent variable is the railway density from the National Land Numerical Information. We control for the distance to the

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closest station to separate the effects of density and distance. In the model, β_1 is the coefficients of interest, which means that the impacts of a 1% increase in rail density on gentrification index.

3. Results

Table 1 describes the results of full sample estimation. The coefficients represent the elasticities, so that a 1% increase in the independent variable results in a $\beta\%$ increase in the dependent variable. For example, we can interpret that a 1% increase in line density induce a 4.271% growth in land price. In summary, the results reveal the following implications. First, we find that higher railway density leads to an increase in the rate of university graduates and higher income households. On the other hand, higher rail density is associated with a decrease in the percentage of people with high school degree as their final education. Furthermore, these effects occur directly and indirectly through land price increases. These results imply that an increase in railway density causes a direct inflow of college graduates and high-income earners, and simultaneously, an outflow of high school graduates. In addition, part of this process occurred through rising land prices. From the above, it can be regarded that railway density causes gentrification with respect to university graduates and high-income households.

Table 1. Estimated coefficients of full sample regression.

	ln(Land price)		ln(Graduate)	ln(High school)		ln(Income)	
ln(Density)	4.271*** (0.269)	0.835*** (0.047)	0.796*** (0.051)	-0.836*** (0.040)	-0.753*** (0.043)	1.177*** (0.152)	0.657*** (0.163)
ln(Distance)	0.506*** (0.036)	0.104*** (0.006)	0.114*** (0.008)	-0.111*** (0.005)	-0.115*** (0.006)	0.163*** (0.020)	0.113*** (0.024)
ln(Land price)			0.0275*** (0.001)		-0.0368*** (0.000)		0.138*** (0.002)
N	117834	117834	117834	117834	117834	117502	117502
R-sq	0.993	0.987	0.987	0.971	0.973	0.958	0.96

4. Conclusion

In conclusion, we interpret our results as a form of graduation gentrification, wherein improvement in railway density induces an influx of highly educated residents, leading to an increase in housing costs, and subsequently an outflux of the less-educated residents, mainly in low to middle income areas.

References

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