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Understanding spatial variations in the impact of accessibility on land value using geographically weighted regression

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Abstract

In recent years, land value capture has attracted increasing attention as a result of its potential for funding transport infrastructure. There has been substantial research into this issue recently in the US, but, in the UK, only a few studies have examined the evidence of the impact of transport infrastructure on land value and these studies have concentrated on

London. As the capital, London is different in many aspects from other cities, and conurbations such as Manchester, Sheffield and Tyne and Wear are more representative of British cities. This study focuses on the impact of the Tyne and Wear Metro, a light rail system, using a Geographically Weighted Regression (GWR) model with property prices as the dependent variable which is then explained by independent variables designed to standardise for household features as well as some spatially defined factors including the transport accessibility of the house location. This methodology allows the estimation of the importance of transport accessibility in determining house prices and helps to identify the potential for land value capture associated with transport investment.

The results from the global regression model (equivalent to a hedonic model) show that the internal factors of the property and socio-economic classification of its location are the dominant determinants of property prices while transport accessibility variables, as key components of property location reflecting land value, are significant too in determining property prices. The results from GWR (the local model) show significant spatially varying relationships between property prices and the variables concerned and allow the impact of accessibility on house prices to be identified.

This study contributes both to a quantification of the impact of public transport infrastructure on accessibility and its policy implications, and a demonstration of a new methodology in the transport field that elegantly takes account of the spatial nature of the data required in this process.

Keywords

accessibility, light rail, land value, land value capture

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