



A QUESTION OF TRANSPORT

Everyone wants more investment in transport infrastructure, but can new railways and roads pay their way by increasing private property values? The latest research gives a qualified thumbs up to land value capture initiatives.

Back in October 2002, Royal Institute of Chartered Surveyors (RICS), then the Office of the Deputy Prime Minister and the Department for Transport, published the Land Value and Public Transport – Stage One report, which assessed the relationship between land use, land value and public transport. The research team developed a draft methodology to test how movements in value as a result of new transport infrastructure could be measured.

Stage Two, published two years later, used both qualitative and quantitative techniques to test this draft methodology on the Croydon (a large town in South London) tramlink. Local opinion at the time suggested that the development of new transport infrastructure increased property values and improved the public perception of Croydon.

This area of investigation has continued to receive attention. In the latest publication in the RICS Research Paper Series, Grace Hongbo Du and Corinne Mulley of Newcastle University used Tyne and Wear (a county in Northeast England) and its Metro railway as a case study for the assessment of transport accessibility and its impact on land value, as expressed in residential property prices.

Motivation

Classical urban land economics identify a trade-off between transport cost and land rental, which explains why a parcel of land located in the city centre, where transport costs are minimal, has a higher value than a parcel of land located on the outskirts of the city. With the development of economies, the demand for mobility grows and substantial investment is

required from governments to fund the necessary infrastructure. However, there are many competing demands on public funds and lack of sufficient transport infrastructure funding to meet all demands is a common issue worldwide.

In the UK, one proposed solution is a policy based on land value capture (LVC), the concept that increases in private land values generated by new public investments are all, or in part, captured through a land-related tax that will pay for that particular investment or other public projects. Various tax-based and betterment-based approaches have been explored as possible mechanisms for financing transport infrastructure. But underlying the debate is one fundamental question: To what extent can transport infrastructure uplift land value? This is the question that Hongbo Du and Mulley tried to answer.

Methodology

Many property studies use hedonic price modelling, which assumes that the price of a house is determined by a bundle of internal features (such as the number of bedrooms) and external factors (such as the nature of the neighbourhood and accessibility to public transport) and estimates the implicit value of these. The problem with hedonic modelling is that it fails to take account of spatial dependencies: for example, the fact that one sale price influences another nearby, and the same house would sell for different prices in different areas. Since the data used is not tied to any geographic or mappable reference, it can supply only global averages, without local variations.

Summary by Amy Roberts. The full report is available to download from www.rics.org

How misleading this can be is illustrated by the example of the relationship between the age of houses and house prices in various parts of England. Global statistics show that, overall, the age of houses does not affect prices significantly. However local variations are significant. Victorian houses, for example, might be prized for their character and command high prices in some parts of England, whereas in others – particularly urban areas that expanded rapidly in the 19th century in the rush to accommodate workers – building standards might have been lower, resulting in poor condition now and lower prices.

Hedonic price modelling is a global model, so the researchers used a relatively new technique, Geographically Weighted Regression (GWR), to analyse the data. GWR can improve on global models by allowing for spatial variation or non-stationarity in the regression parameters. In short, it calibrates a hedonic-global model and then produces local estimations which are plotted in map form using GIS.

The data used in this study was collected in 2004, 20 years after the opening of the Tyne and Wear Metro, a light rail service. Data was collected for the whole of the Tyne and Wear region, including areas which had benefited from long exposure to the Metro, other areas, such as Sunderland (a city in Tyne and Wear), where the Metro was relatively new, and areas with no access to the Metro at all.



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Findings

1. The global model demonstrated that proximity to Metro stations could significantly increase house prices, as could transport accessibility to secondary schools. However, the local analysis provided by GWR demonstrated that the positive premiums resulting from good Metro access was not uniformly distributed. Transport accessibility had a positive effect on land value in some areas, but a negative or zero effect in others.

This means that implementation of a uniform LVC policy would produce winners and losers, but the study opens the way for more research, to gain a better understanding of who the winners and losers would be. If the government knew that, it could choose the location of transport infrastructure wisely, ensuring that the winners were in the relatively poor areas.

Thus, the local information generated by GWR provided scope for future research by asking as many questions as it answered.

2. In this case study, being within 200 metres of a Metro station was positive (showing a premium of £27,396, or 17.13% of mean house price) over much of the study area, but there

was one notable exception: Borough, which has the highest unemployment rate in Tyne and Wear. However, there were no significant negative effects found for any house within 200 metres of a Metro station.

3. Globally, houses within 201 – 500 metres of a Metro station gained £14,193 (8.87% of mean house price) in house price premiums, compared to properties 1km away. By contrast, GWR showed significant negative premiums of £10,000 – £32,056 (from 5% to 30.38% of house price) in three areas, indicating that this

proximity is not valued positively by households in these areas. Only two areas showed Metro proximity having a significant positive effect, with premiums of between £20,000 and £43,977, or between 5% and 50.46% of the house price.

4. While the global findings were that better transport accessibility to large employers reduced house price, local GWR estimations showed three areas where a one-minute-quicker car or public transport journey to large employers added a premium of up to 29.8% of house price. The positive premiums tended to fade with distance from large employers, in line with classical land theory.

5. Transport accessibility to primary schools reduced house prices by £2,454/minute (1.53% of mean house price), which the researchers assume points to some negative effect of primary schools unknown

to them. In one area, being close to primary schools decreased house price by up to 46.42%. Significant positive premiums for house prices were found in just one area in the south, calling for further investigation.

6. The global model suggested that the relationship between house price and transport accessibility to further education establishments and colleges was positive. However, the GWR model showed that this was not true for most homes in Tyne and Wear, with the exception of two areas in the south east of the study area, which showed up to 8.81% positive premiums. In a large part of Gateshead and Newcastle (cities in Tyne and Wear) there was a pronounced negative relationship between the two, with negative premiums of up to 50.8%. The researchers suggest that this disparity might relate to the neighbourhoods the colleges serve.

7. There were more positive and higher house price premiums around the Metro stations that had been in service for decades than there were around new SME stations opened just two years before the data was collected. This suggests that any effect of Metro on land value takes a long time to occur. 🌱

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