ASK: NUS ECONOMISTS

Traffic congestion affects commuting costs which impact on housing prices

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Does traffic congestion affect the price of housing?

YES, traffic congestion can impact a flat’s price but whether the impact is positive or negative depends on how far the flat is from the central business district (CBD).

It is well known, by economists and laymen alike, that housing located in city centres is generally more expensive than housing on the periphery. Much of this price differential, or location premium, arises because the city centre is where most economic, cultural and recreational activities take place.

Nobel Prize winner Robert Lucas, for example, writes: “Productivity is centred on the city centre, and people live at differing distances from their jobs. In choosing a residential location, households face a trade-off between expensive land near the centre with small travel times, and cheap land farther out with large travel costs. Everyone who has looked for housing in any city or suburb knows the reality of this trade-off.”

In Singapore, housing in and around the CBD also enjoys an extremely high location premium.

For example, for the period 2002-2012, the price of a private resale flat in Clementi was on average $490 less per square foot than one in River Valley, which is about 3km closer to the CBD. Resale prices were even lower in Choa Chu Kang, which is an additional 3km farther away from the CBD than Clementi and nearly $625 less per square foot than in River Valley.

Because much of the location premium is driven by travel costs, it is not surprising that this premium changes when commuting costs, such as the price of petrol or ERP rates, change.

For example, one United States study found that a $1 increase in the price of petrol reduces the value of the average commuter’s home by US$5,000 ($60,300) relative to a home near employment opportunities.

Traffic congestion, however, is an area of commuting costs that has been largely neglected by economists.

Clearly, the greater the traffic congestion, the longer it takes to get to work. This situation not only imposes a time cost but also a psychological cost. Hence, greater traffic congestion should increase the location premium as the additional costs increase people’s willingness to pay more to live closer to the CBD.

Differences in average prices in different locations, while informative, do not just reflect the location premium. Many other factors also affect flat prices. For instance, housing near the CBD might be more luxurious than houses elsewhere. Some areas may be more industrialised than others. Thus, to correctly measure the true causal effect of traffic congestion on the location premium, any analysis will have to move the complicating effects of these types of different factors.

In our research, we eliminated these factors by using two specialised statistical techniques.

The first technique compares price changes of flats that are sold at least twice in the resale market. Since housing characteristics such as flat size or afternoon facing do not change over time, these factors should not contribute to any price change from the first to the second time the flat was sold. They are thus eliminated from the analysis.

The second technique, called instrumental variables estimation, uses variables called instruments that influence traffic congestion, such as the number of expressways in Singapore, but have no direct impact on any other factors that affect housing price. Because the instruments move independently of the confounding factors, we can be sure that any co-movement in traffic congestion and the location premium are not capturing any effects of the confounding factors.

In short, if we find that resale prices away from the CBD increase faster than in and around the CBD when there is more traffic congestion, then these statistical techniques ensure that it is traffic congestion, and not other factors, that causes the location premium to increase.

The results of a study we conducted using data from 2002 to 2012 show that the average peak-hour expressway speed, our measure of traffic congestion, does indeed have a sizeable effect on the location premium.

A flat 1km from the CBD appreciates 1.5 per cent more than one in the CBD when expressway speed increases by 1 per cent. A flat 10km away from the CBD would see an even greater payoff, appreciating nearly 5 per cent more than a flat in the CBD.

Conversely, if expressway speeds slow and traffic congestion increases, the price of housing in the CBD will increase relative to housing in the suburbs.

It is informative to consider what these numbers mean for particular flats.

An increase in peak-hour expressway speed from 63km per hour, the recent historical average, to 64 kmh results in housing in Kallang, about 3km from the CBD, appreciating by $17 per square foot more than housing in the CBD. In other words, a 1,500 sq ft flat in Kallang would see more than a $25,000 increase in value compared with a similar flat in the CBD simply because of the change in expressway traffic.

In Ang Mo Kio, about 10km from the CBD, prices would increase by $27 per square foot, and a 1,500 sq ft flat would appreciate by about $40,000.

Due to data limitations, we were not able to measure the impact of traffic congestion on HDB housing. Nevertheless, the theory would suggest that HDB resale prices should follow a similar pattern.

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