

Ask: NUS Economists

How commuting times affect HDB flat prices

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Q Do unexpected public transport delays affect housing prices?

A Commuting to work is often time-consuming, expensive and stressful, even on the good days. No wonder most people dread it.

Economists dislike commuting as much as anyone and have studied how commuting patterns affect many economic outcomes, such as productivity, where businesses choose to locate and pollution.

One particular area of interest has been the trade-off between choosing where to live and the price of housing. Many empirical studies have found that one of the reasons why housing farther away from employment centres such as the Central Business District (CBD) sells for a lower price is the long commutes that residents must endure. In other words, when choosing a home, individuals

choose between paying more for living near the CBD and having a shorter commute, and living farther away at a lower price and having a longer commute.

However, trip duration is not the only notable feature of commuting. Commuters using public transportation know well the frustration associated with reaching the bus stop or MRT station and not being able to board because the bus or train is delayed or there is no remaining room for boarding. Even if you are able to board quickly, roads that are more congested than usual can mean arriving at work late, even after having allocated enough time for the usual duration of the trip.

Do these occasional delays affect housing prices? Surprisingly, there has been no study measuring the effect of this day-to-day variation and uncertainty in commuting.

We studied this question with data on trips on public transport and transactions of Housing Board (HDB) resale flats. Our approach, in a nutshell, was to measure whether flats in HDB blocks with high travel-time uncertainty are sold at a discount.

We used the trip data to compute average peak-hour trip duration in

minutes from each HDB block to the CBD over 90 days in 2015 and 90 days in 2016. This calculation gives the overall expected time that it takes to reach the CBD, averaging away any unusual day-to-day variation.

Further, we calculated how day-to-day average commuting times differ from the overall average duration using statistics such as standard deviation, which measures how disperse outcomes are around the average and indicates which routes are prone to bad commuting days.

We then estimated how flat prices in blocks on routes with greater standard deviation are affected.

How prices differ across blocks, while informative, does not necessarily reflect solely the effect of travel-time uncertainty. This is because many other factors also affect flat prices. For instance, flats near the CBD might be smaller than flats elsewhere and some areas may be more industrialised than others. Thus, to correctly measure the effect of travel-time uncertainty on price, any analysis will have to remove the confounding effects of these different factors.

We did so using regression analysis, controlling for a wide range of variables such as flat size, model, floor number and location, to eliminate any bias that would otherwise distort our estimates.

We found that both average trip duration and travel-time uncertainty are indeed capitalised into price.

An increase in average trip time to the CBD of 10 minutes decreases the flat price by about 7.5 per cent. Moreover, a one-minute increase in the standard deviation of travel time above five minutes decreases prices by around 2 per cent.

Our findings that people value not only average commuting time, but also certainty in their commute, have important policy implications.

Policymakers should be especially alert to public transport bottlenecks that are susceptible to day-to-day changes in congestion, which will cause unexpected delays, and bus operators should consider the potential trade-off between average travelling time and travelling uncertainty when planning routes.

For instance, commuters might be better off taking bus routes that avoid road segments that are prone to congestion, even at the cost of a longer average commute.

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The writers' findings that people value not only average commuting time, but also certainty in their commute, have important policy implications. Policymakers should be especially alert to public transport bottlenecks that are susceptible to day-to-day changes in congestion, which will cause unexpected delays. ST PHOTO: KUA CHEE SIONG