

IT5006 - Group 25 - Impact of Downtown Line Opening on Prices of HDB Flats

Introduction and Problem Statement

To determine the effect of a new MRT line opening in Singapore on the resale value of HDB flats in surrounding areas. As the proximity to MRT stations is a sizable factor in HDB resale prices, we want to further explore the relationship between the two variables (resale price vs MRT proximity).

The insights from our analysis can help:

- Buyers and sellers on assessing HDB resale prices, and convenience factors
- Determine the tangible value of being situated near a MRT station

Dataset Description

Based on our proposed problem, we would need to match each HDB unit with its closest MRT station at the time of sale. To do so, we would need:

- Coordinates of each HDB unit (or block, since all units in the same block would share the same coordinates);
- Coordinates of all MRT stations;
- Opening dates of all MRT stations

Opening dates of the MRT stations are required as we need to determine if a MRT station, which is currently present, was available when the flat was sold in the past. If the MRT station did not exist, then we should not account for the presence of that MRT station. A summary of the data sources and data items is provided in the table below.

Data Required	Source of Data	Details
Coordinates of each HDB Unit	OneMap API	Repeatedly call the OneMap API with each block's address to get the coordinates and postal code as a JSON object.
Coordinates of all MRT Stations	Kaggle (Link)	Readily available data, last updated as of Oct 2021.
Opening Dates of all MRT Stations	Wikipedia	Scrapped the opening dates from Wikipedia.

Methodology & Outline of Solution

We aim to prove that the resale price and the distance from the MRT station have a statistically significant negative correlation. We plan to achieve this by comparing the before MRT opening vs after MRT opening resale prices of HDB while controlling for other factors.

This could be achieved through the use of a difference-in-difference regression analysis, where we will categorise flats into four different sub-groups: treatment vs. control, before opening vs. after opening.

For this analysis, we will focus specifically on the Downtown MRT line (blue), where the size of the impact would be $(\text{Group}_{\text{Treatment, After}} - \text{Group}_{\text{Treatment, Before}}) - (\text{Group}_{\text{Control, After}} - \text{Group}_{\text{Control, Before}})$.

	Before Opening	After Opening
Treatment ($\leq 500\text{m}$)	$\text{Group}_{\text{Treatment, Before}}$	$\text{Group}_{\text{Treatment, After}}$
Control ($> 500\text{m}$)	$\text{Group}_{\text{Control, Before}}$	$\text{Group}_{\text{Control, After}}$