

How Much Should You Be Paying For That HDB Flat?

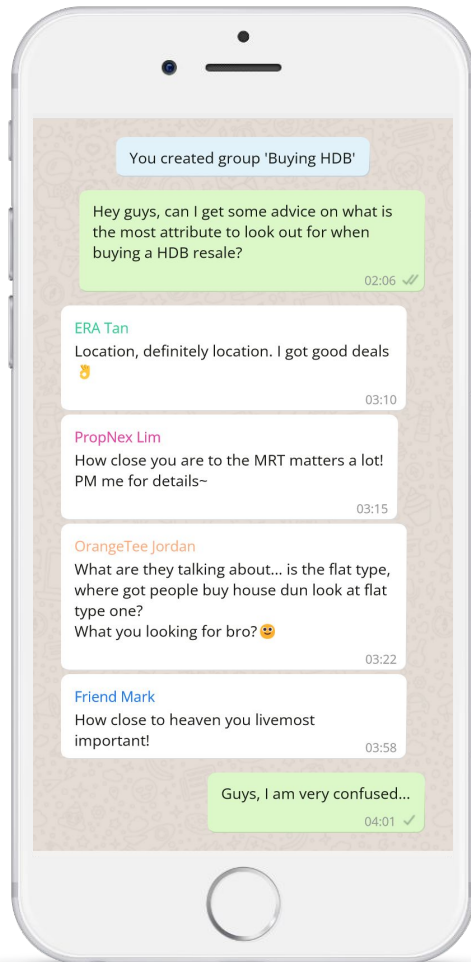
Using linear regression to identify HDB attributes that influence resale price

DSIF-SG-9:
Mak Wei Yip
Tan Song Kai
Priscilla Li
Wen Yusheng



The Problem

- Using historical resale HDB transaction data, can we more accurately predict HDB Resale Price for a potential buyer to determine the estimated market value of the HDB flat they are interested in?
- Can this help a buyer to understand what factor play a larger part in influencing HDB Resale Price



Different property agents, friends, websites all talk about various HDB attributes being important

Who should you believe?

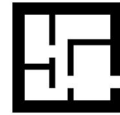
How much does each actually matter?

Today, we will let the data speak for itself

Taking a data-driven approach, these are the most important factors affecting the price you can expect to pay



Flat Model
Up to **\$414k**



Flat Type
Up to **\$73k**



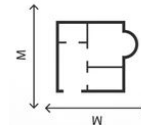
Flat Location
Up to **\$84k**



HDB Height
Up to **\$63k**

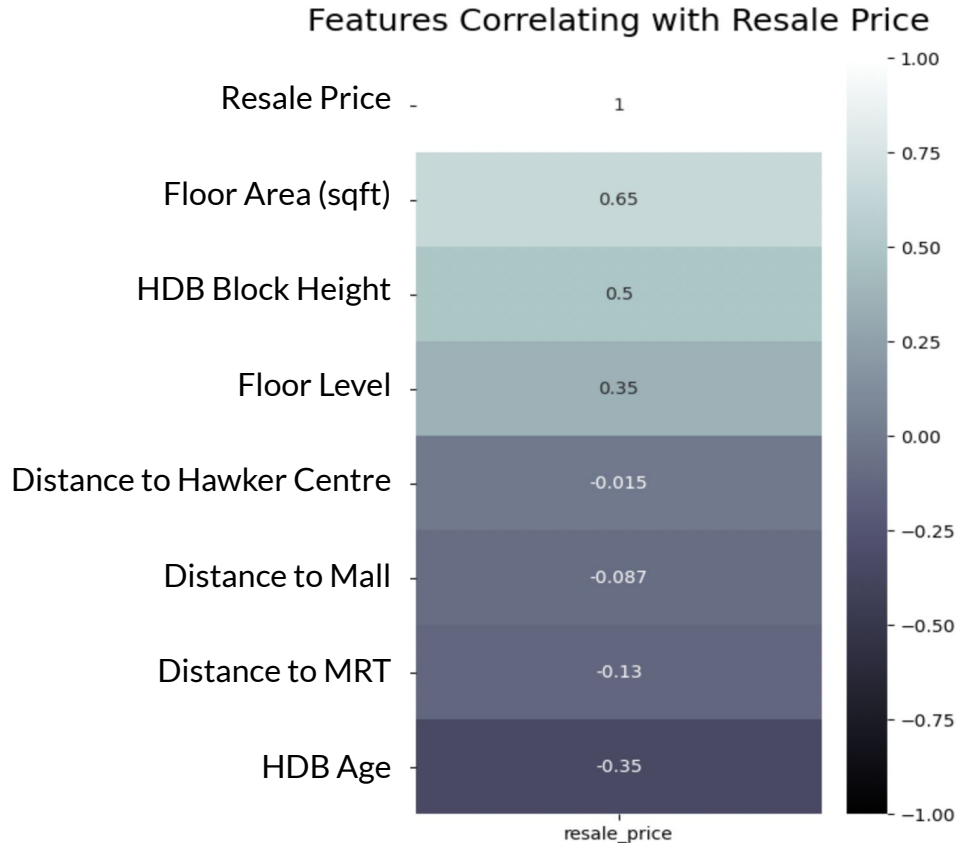


Floor Level
Up to **\$75k**

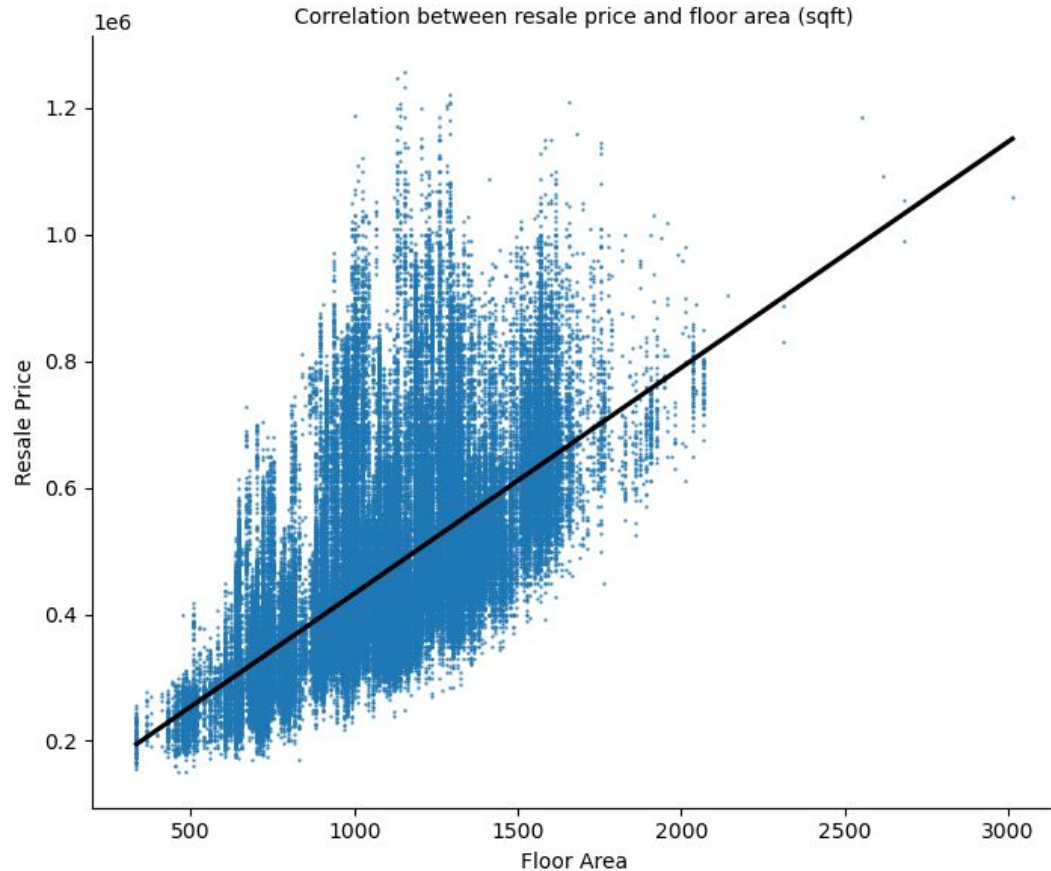


Floor Area
ea 100sqft **\$32k**

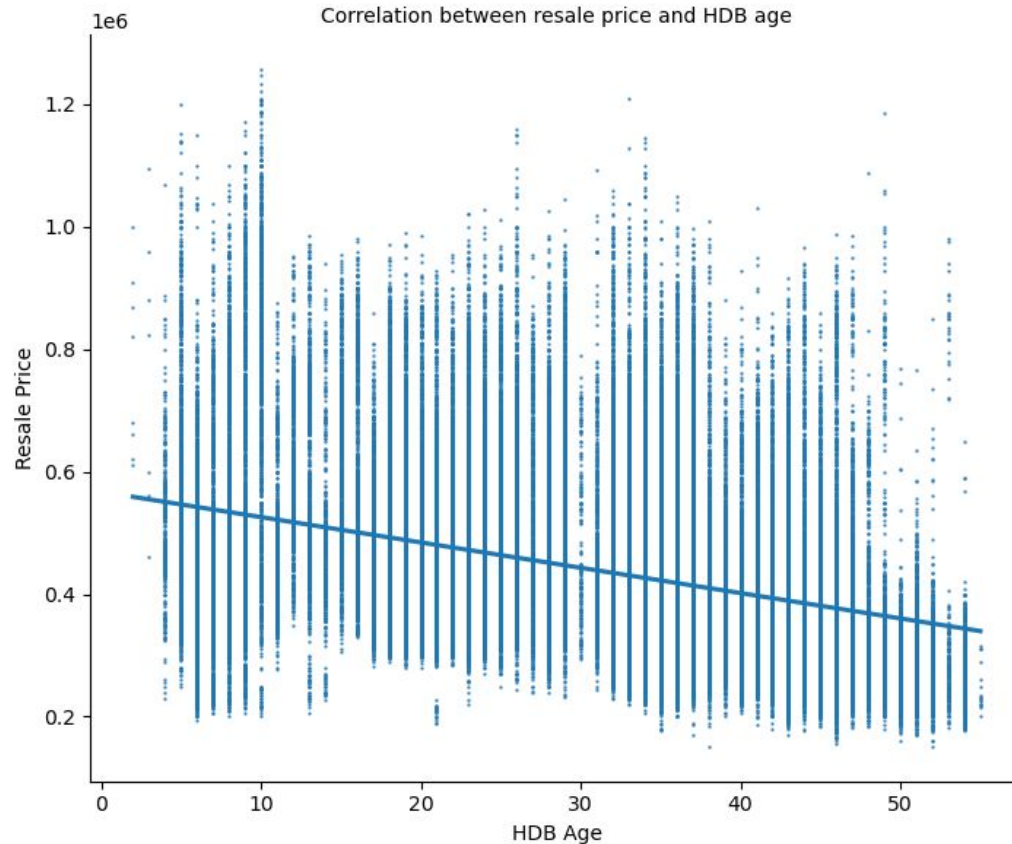
From historical HDB resale price data, these variables have the highest correlation with price



Floor area definitely plays a role in determining resale price

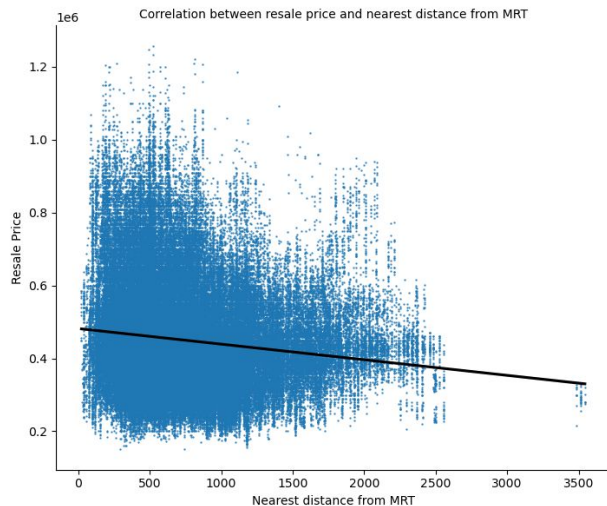


The older a unit, the cheaper it becomes?

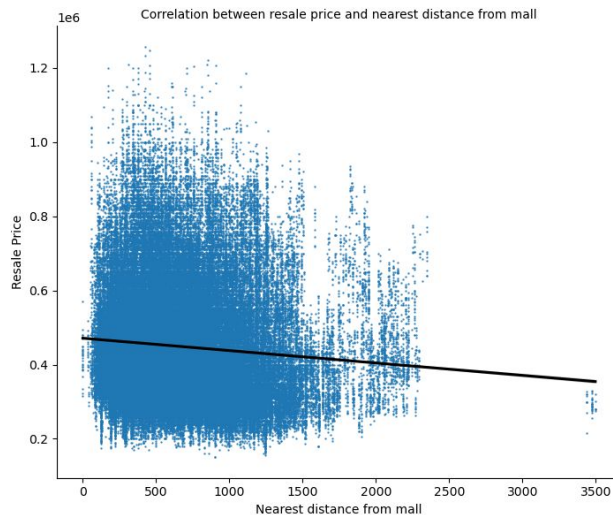


It's not just only about our houses

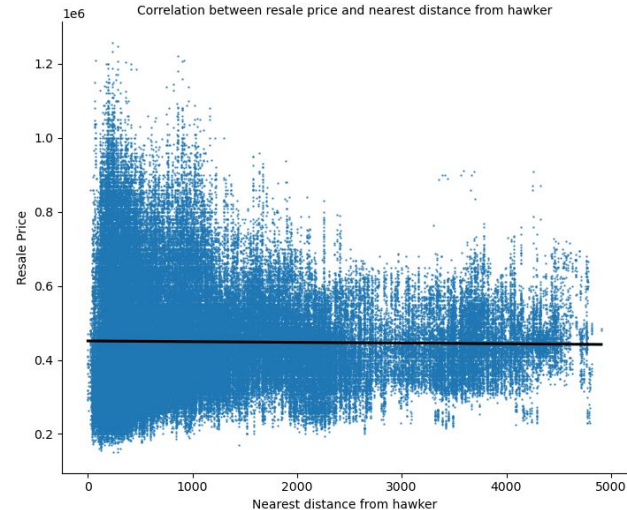
MRT



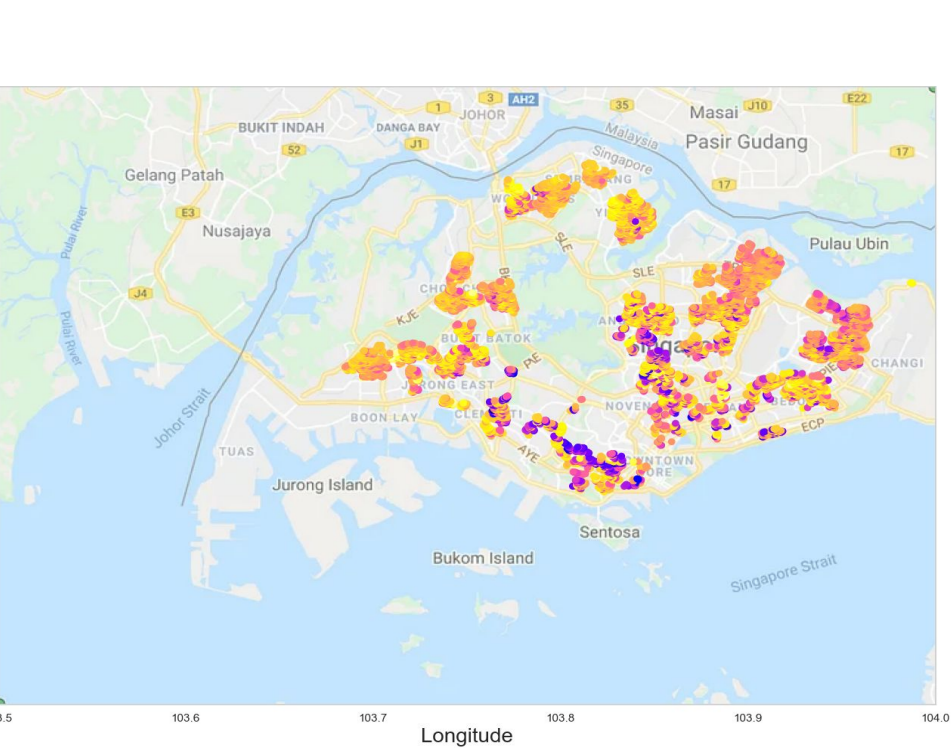
Malls



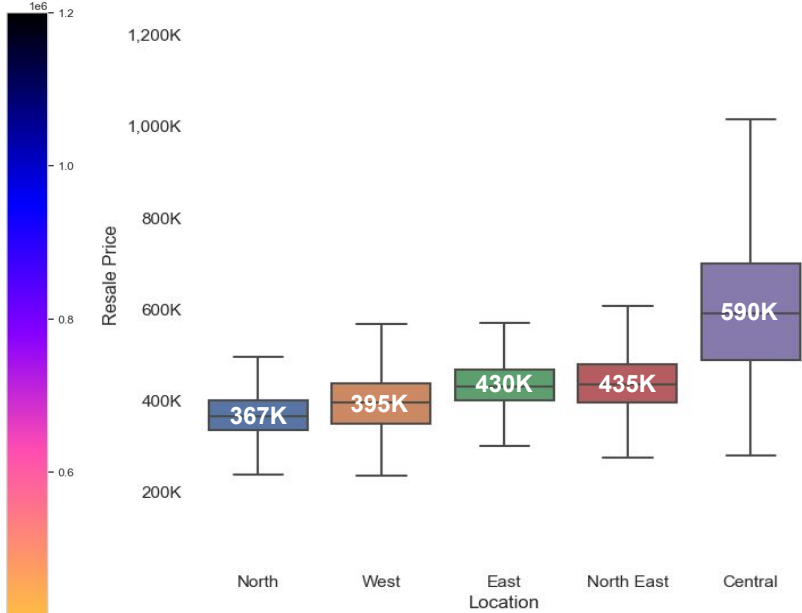
Hawker Centres



Location has an impact on resale price

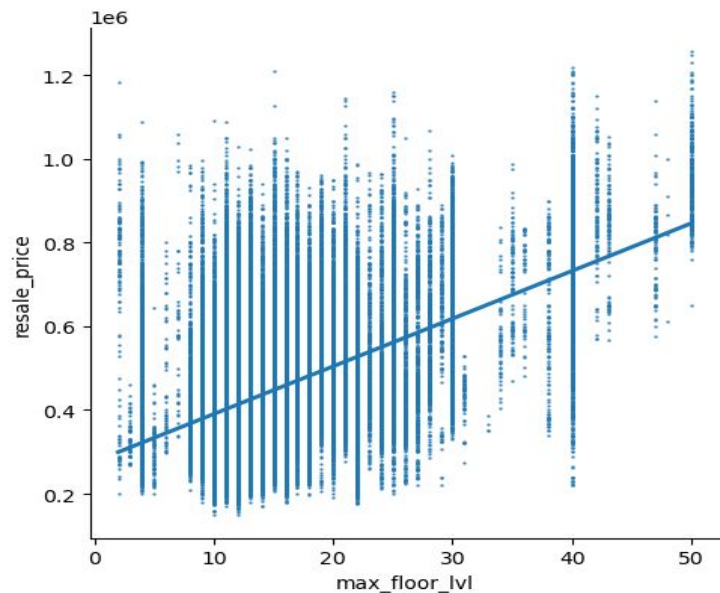
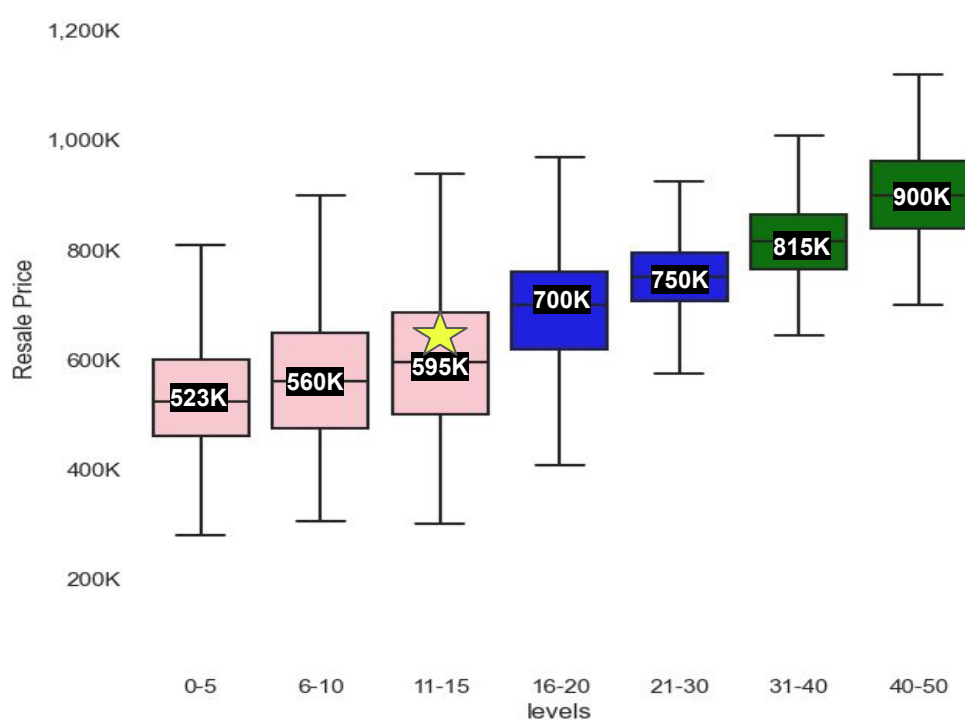


Distribution of Resale Price of 4Room HDB by Location

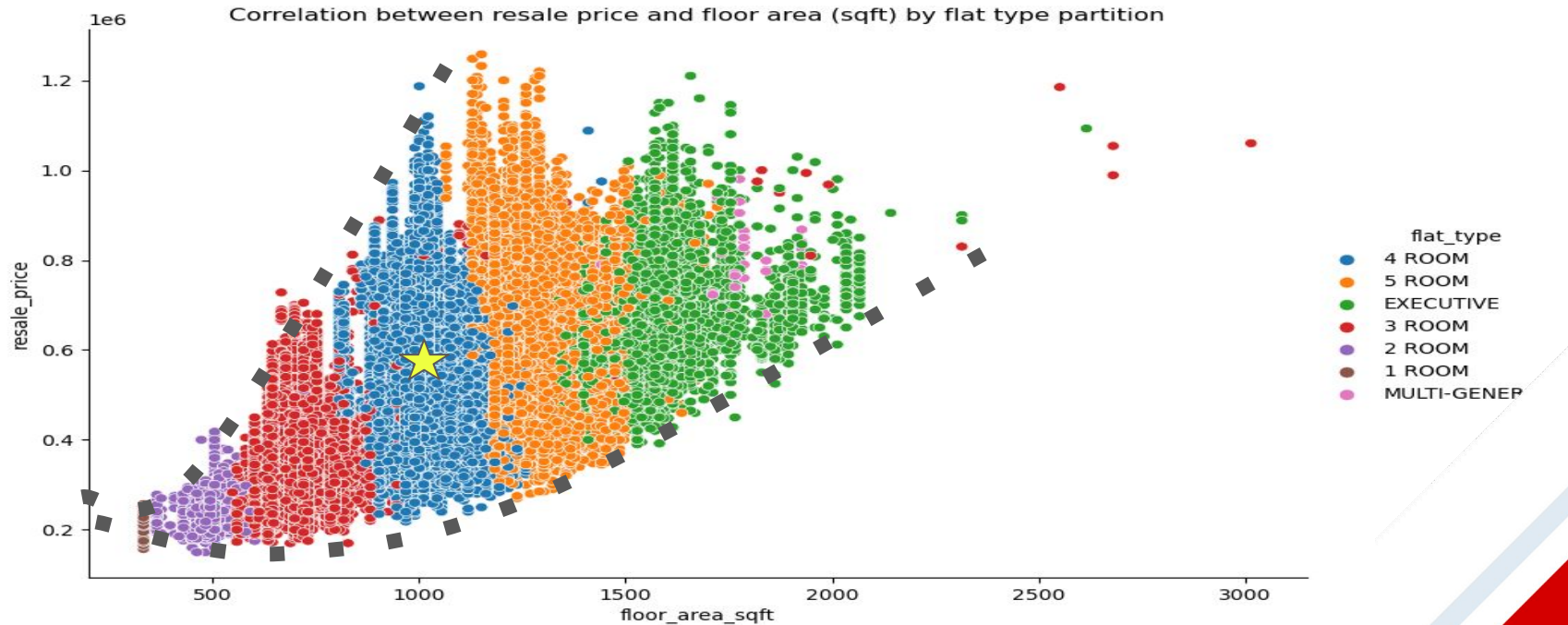


Higher floors command higher prices

Distribution of central region 4Room HDB resale Price by levels



The type of flat also impact on resale price... though not always the case



After exploring the relationship of each attribute with resale price, 2 questions remain...

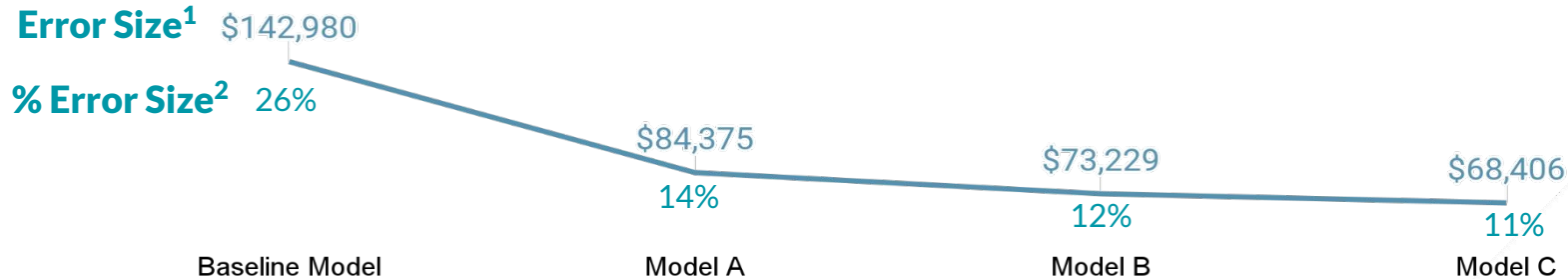
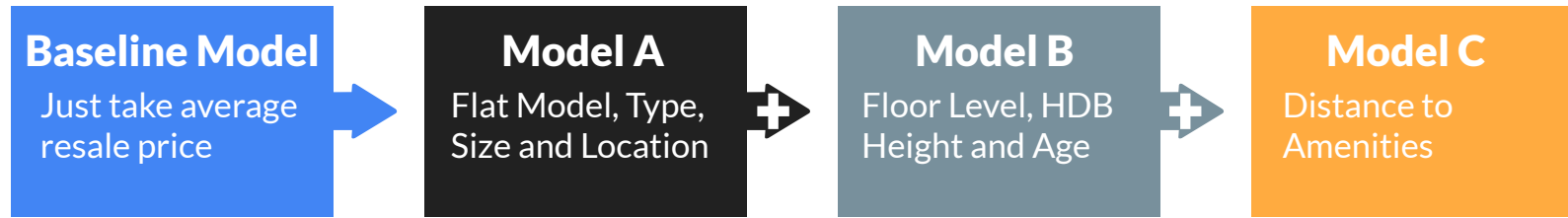
What is the specific impact of each variable on resale price?

If I buy a unit 15 floors higher, how much more do I expect to pay compared to the 10th floor?

How do all the variables come together to affect how much I can expect to pay?

If I want to buy a 5 room HDB in the central region on the 25th floor or higher, how much am I expected to pay?

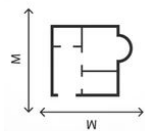
Our model is iteratively refined to provide the most accurate prediction for the average buyer



Note 1: Error size refers to the RMSE, a.k.a. average uncertainty in the resale price prediction (e.g., the error size of \$20k means the predicted price could be on average \$20k higher or lower than the actual price) on the test dataset

Note 2: % error size refers to the RMAPE, a.k.a. average percentage uncertainty in the resale price prediction on the test dataset

The HDB flat's inherent attributes and location have significant impact on resale price



Flat Size

Every 100sqft	\$32k
---------------	-------



Flat Model (v 2R Flexi)

Terrace	\$414k
---------	--------

Mansionette	\$49k~\$143k
-------------	--------------

Type S1/S2	\$32k~\$121k
------------	--------------

DBSS	\$108k
------	--------

Multi-Gen	\$73k
-----------	-------

Apartment	-\$43k~\$68k
-----------	--------------

Simplified	-\$21k
------------	--------

New Gen	-\$31k
---------	--------

Improved	-\$36k
----------	--------

Model A/A2	-\$84k~-\$53k
------------	---------------



Flat Type (v 1 Room)

Multi-Gen	\$73k
-----------	-------

Executive	\$35k
-----------	-------

5 Room	\$35k
--------	-------

4 Room	\$40k
--------	-------

3 Room	\$28k
--------	-------

2 Room	\$2k
--------	------



Flat Location (v outside central area)

Central	\$84k
---------	-------

Flat's floor level and HDB block's characteristics also have an impact on resale price but amenities have limited impact



Floor Level (v <Lvl 16)

>Lvl 30	\$75k
Lvl 16~30	\$44k



HDB Block Height

Every 10 lvls	\$63k
---------------	-------



HDB Age

Every 10 yrs older	-\$23k
--------------------	--------



MRT Distance

Every 100m further	-\$4.6k
--------------------	---------



Hawker Centre Distance

Every 100m further	-\$1.8k
--------------------	---------



Mall Distance

Every 100m further	\$1.1k
--------------------	--------

In summary, a data-driven approach gives insights on most important factors affecting the price you can expect to pay



Flat Model
Up to **\$414k**



Flat Type
Up to **\$73k**



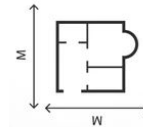
Flat Location
Up to **\$84k**



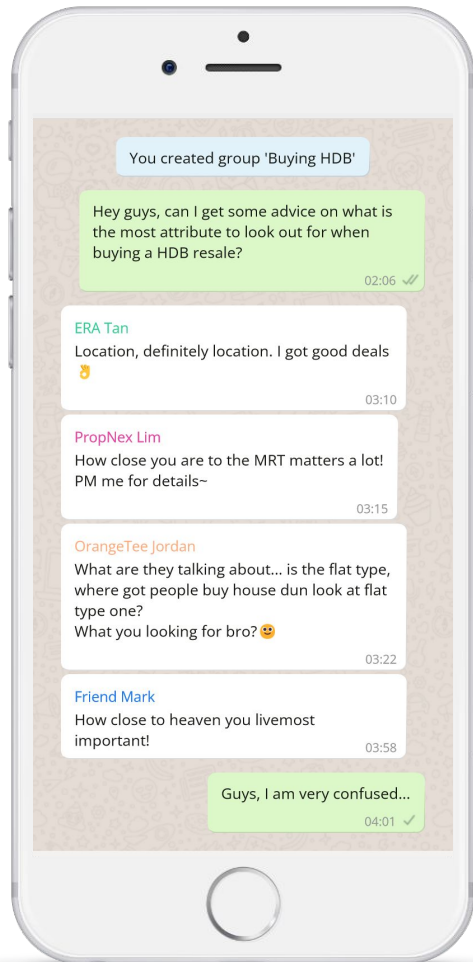
HDB Height
Up to **\$63k**



Floor Level
Up to **\$75k**



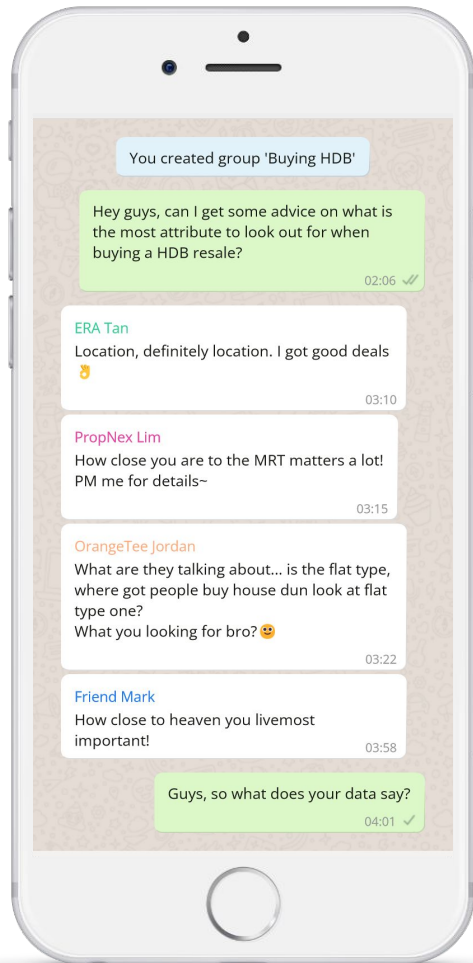
Floor Area
ea 100sqft **\$32k**



We are just scratching the surface...

Our analysis is suitable for the average buyer

But probably more useful than what you heard over WhatsApp



... are you an average buyer?

HDB attributes are valued differently by buyers based on their needs. We can further tailor the model based on buyer archetypes



THANK YOU

Q&A