



EFFECT OF PROXIMITY TO METRO STATIONS AND DISTANCE FROM CENTRAL BUSINESS DISTRICT ON RENTAL PRICES IN DELHI-NCR

Presented By:

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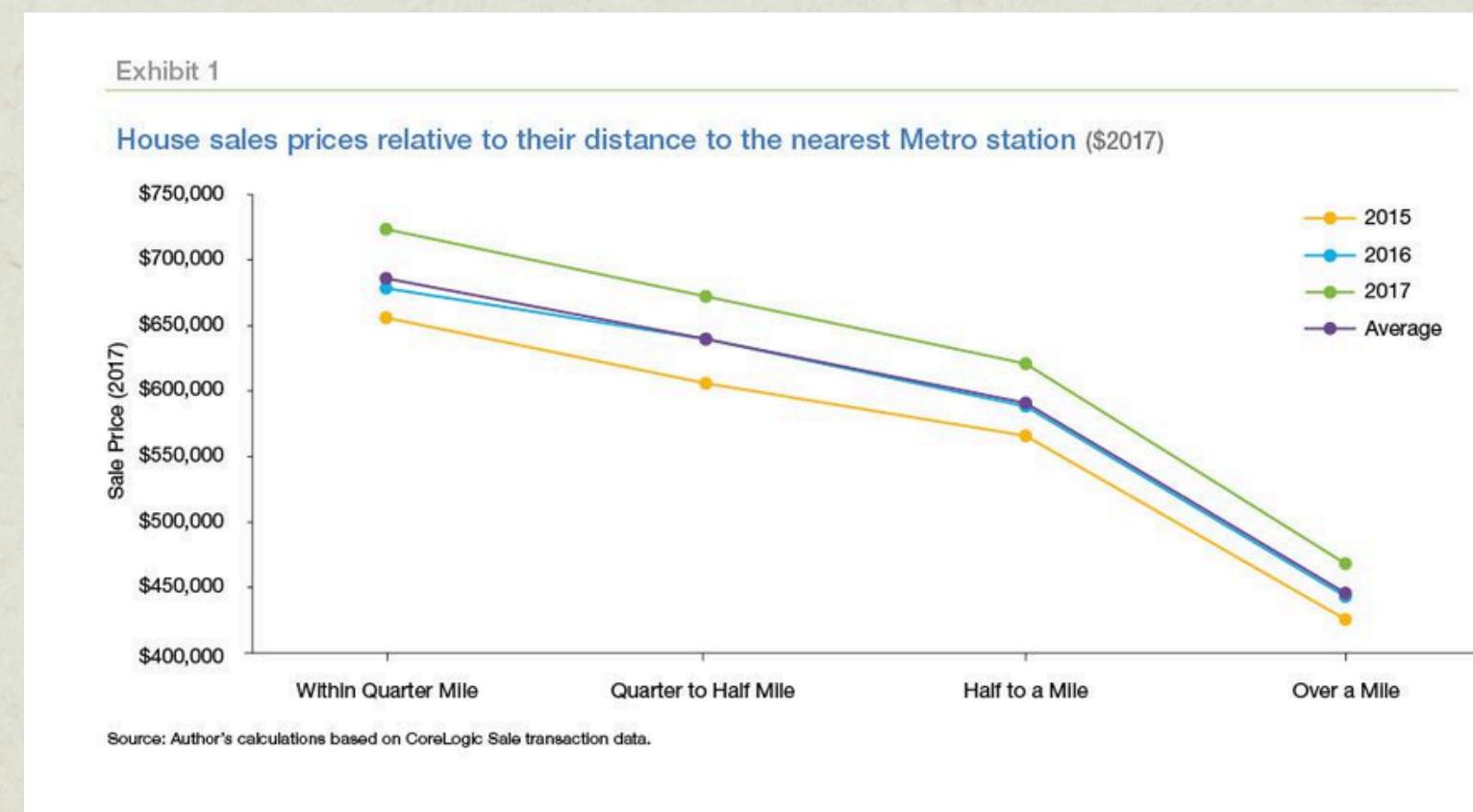
THE QUESTIONS

1. How does the distance from the central business district (CBD) affect rental prices in Delhi-NCR?
2. How does the proximity to metro stations affect rental prices in Delhi-NCR?

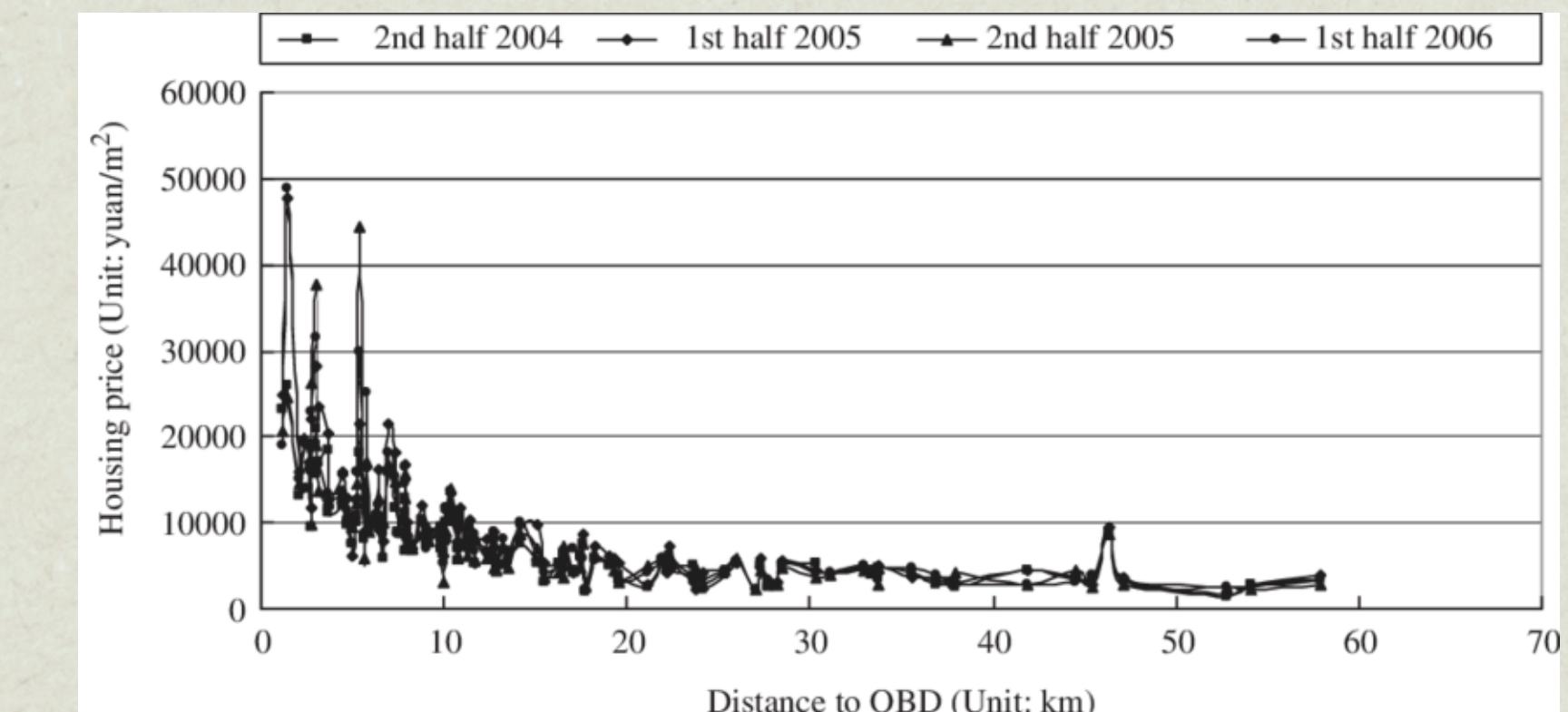
LITERATURE REVIEW

Past studies have shown that property values and rental prices tend to increase with metro accessibility ([Zheng Li, 2018](#); [Freddie Mac, 2019](#)). We believe that this might be true for Delhi-NCR as well.

It is also widely known that properties closer to the central business district (CBD) tend to have higher values ([Jie Chen & Qianjin Hao, 2008](#)). This is likely to be true for a large metropolitan city like Delhi-NCR.



([Freddie Mac, 2019](#))



([Jie Chen & Qianjin Hao, 2008](#))

HYPOTHESES AND MODEL

$$\ln(R) = a_1P + a_2D + a_3(P \times D) + a_4$$

We propose a Linear Model (LM) where:

- R is rental price (₹/square foot),
- P is proximity to the nearest metro station (meters),
- D is distance to the city center (kilometers)
- a_1, a_2, a_3, a_4 are regression coefficients.

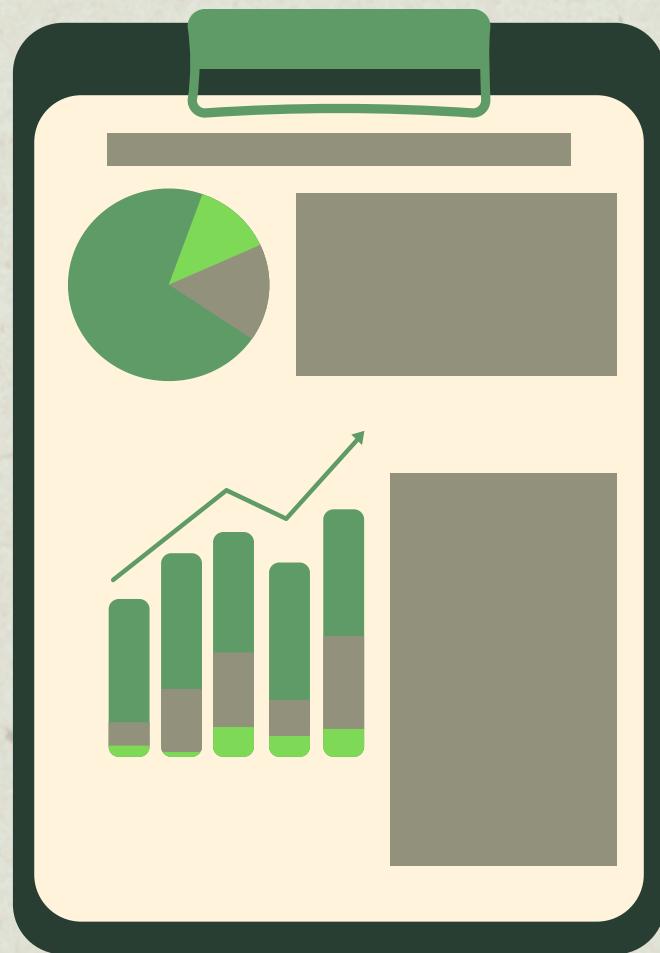
H1: There exists a correlation between proximity to the closest metro station of a property and the rent paid per square foot.

H2: There exists a correlation between the distance of a property from the Central Business District and the rent paid per square foot.

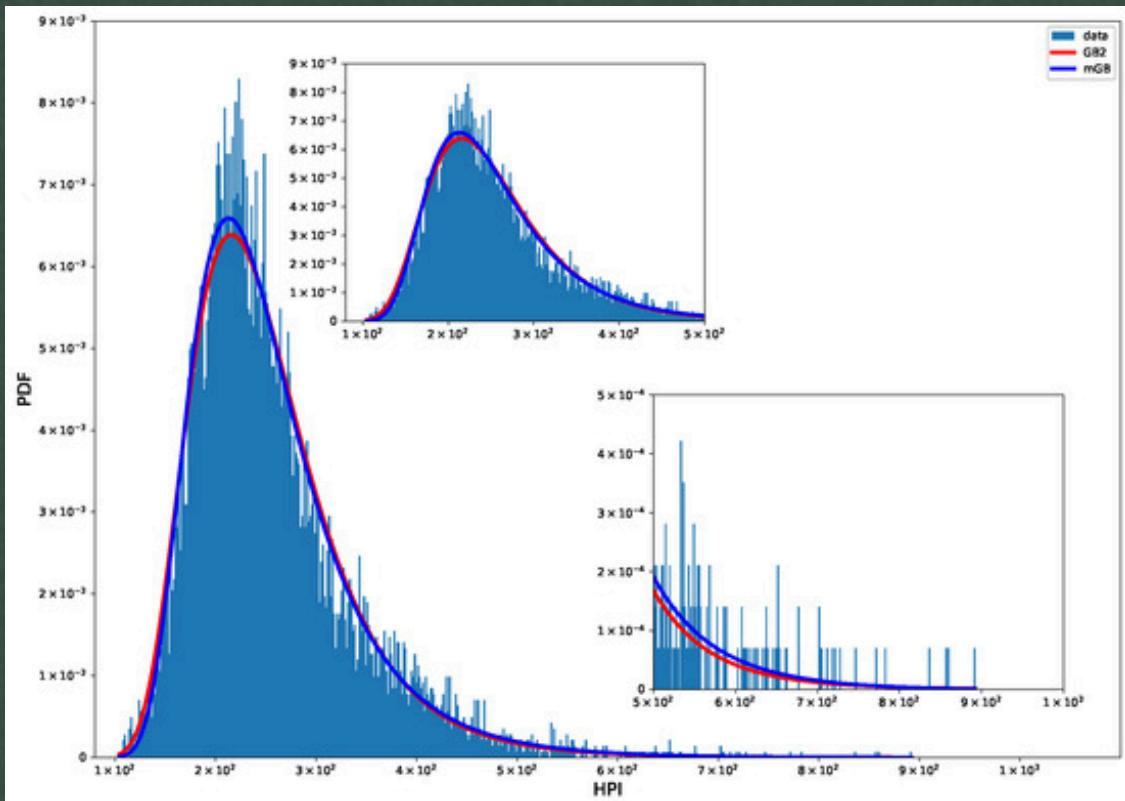
H3: The impact of proximity to the nearest metro station on rent per square foot varies for different distances from the central business district.

DATA

- **Residential Rental Prices – R**
 - Survey
 - Government records
- **Distance to Central Business District (CBD) – D**
 - Remote Sensing: Straight-line distance (displacement) between each property and the city center.
- **Distance to Closest Metro Station – P**
 - Remote Sensing: Straight-line distance between every property to the closest metro station.



STUDY DESIGN



(Jiong Liu, Hamed Farahan & R.A. Serota, 2024).

Issue 1:

We expect the distribution of rent prices for a given area to be **right-skewed** because in a given neighborhood, property values reflect the income distribution of the residents which is usually composed of more low-to-mid-income residents and a few very high-income residents (Liu, et. al., 2024).

Resolution: Sample data such that it is normally distributed. This will allow us to use an LM instead of a GLM.

Issue 2:

We also expect properties closer to the city center to also be closer to a metro station since there is a higher density of metro stations inside the city compared to the outskirts.

Resolution: Sample an equal number of properties with proximity P for both low and high distance to CBD. This will ensure that there is no bias in the data.

PREDICTIONS

- 1) **Rejection of H1 null:** We expect that the rental price will decrease as the proximity to a metro station decreases. This will be true until a threshold distance beyond which the metro proximity will have a negligible effect. Implication: Residences closer to metro stations can charge higher rents per sq foot compared to those who do not.
- 2) **Rejection of H2 null:** We expect that the rental price will decrease as the distance from the city centre increases. This will also decrease till a certain threshold distance beyond which the distance will have a negligible effect. This means that people living near central business districts can charge higher rents per sq foot
- 3) **Rejection of H₁ and H₂ nulls + significant (PxD) term:** We expect that being closer to a metro station is more valuable the further you are from the city centre.

THANK YOU!