What factors influence the price of land in the ACT?
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Introduction

The housing and land market is constantly evolving. There are many factors that influence the price of land in the ACT. In this inquiry, the factors looked at included the size of land and the location factors. The location factors consisted of population density, distance from city and age of suburb.

The data was collected in early November 2018 from a random 200 houses from the 'All Homes' website. For each property, the numerical value used was the UV price. The unimproved land value (UV) is the dollar figure a block of land is deemed worth without any buildings or structures on it. However there is a small reason behind this 'however'. There is a slight inaccuracy with the primary data collected as it isn't specifically the land for sale, it is a property with house on it. The separate deemed value for the land has been used. Another issue involved with the collection of data is that the sample space is quite small. According to the 2016 census, there are 145,229 households in Canberra; only 200 of which are involved in this inquiry.

Hypothesis

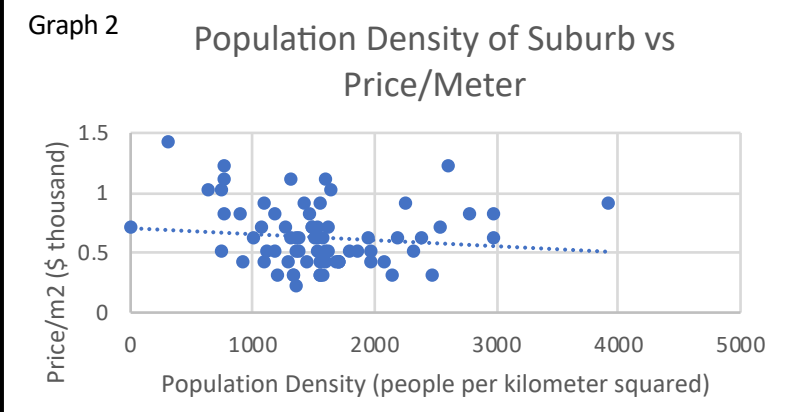The both the factors of size of land and location of property will effect the price of land.

Method

1. The primary data (land size, UV price and suburb) of each individual property was taken from the 'All Homes' website. The foundation date was researched.

2. The secondary data of population density was collected from the Australian Bureau of Statistics and the distance from the city was collected from 'My Boot'.

3. The outliers for land size and price of the data set were removed and a scatterplot graph comparing the land size and UV price was constructed.

4. The average land price and size were calculated from the data sets for each suburb then the price per square metre was calculated and displayed in a bar graph.

5. Graphs were then constructed for the distance from city, population density and suburb age vs price per meter.
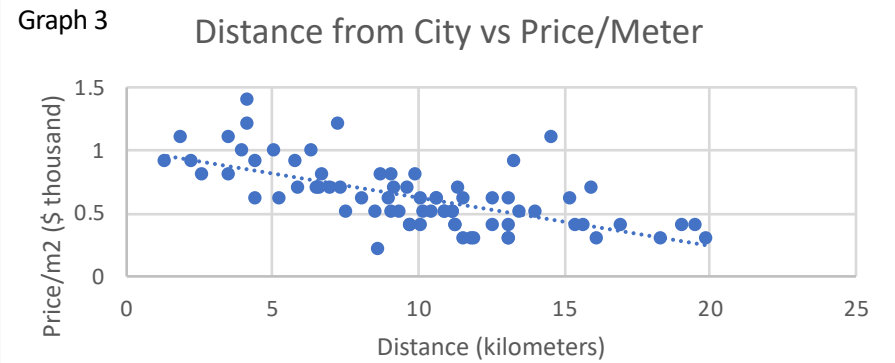
Size and Price - Results

Graph 1

Size vs Price
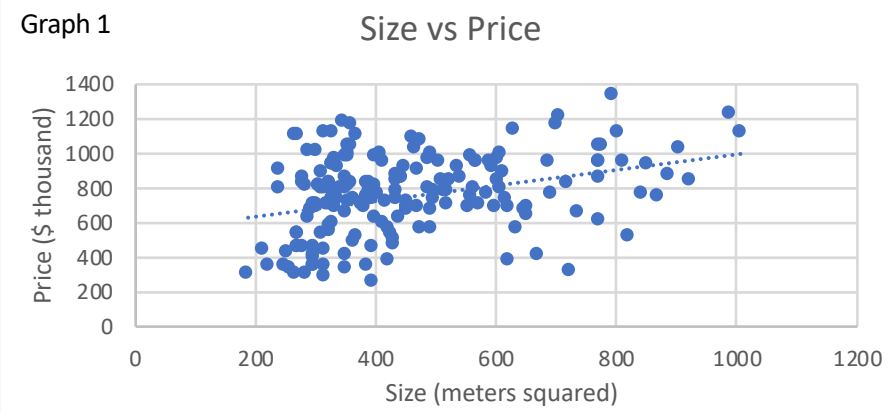
X-axis: x̄: 752.48 **Mode:** 450 **Median:** 769 **Range:** 1085 **IQR:** 302 **σ:** 229.43
Y-axis: x̄: 460.21 **Mode:** 299 **Median:** 403 **Range:** 824 **IQR:** 240 **σ:** 176.04

This scatterplot depicts the relationship between the average size and price of properties across various suburbs in the ACT. It shows a weak positive correlation between price and area of land. The spread of data has an average price of $460,210 for 752.48m2 of land.

Distance from City - Results

Graph 3

Distance from City vs Price/Meter

X-axis: x̄: 9.97 **Mode:** 13.2 **Median:** 10.1 **Range:** 18.5 **IQR:** 5.8 **σ:** 4.35
Y-axis: x̄: 0.63 **Mode:** 0.4 **Median:** 0.6 **Range:** 1.2 **IQR:** 0.4 **σ:** 0.26

This scatterplot expresses the connection between a suburbs distance from the city and its average price per square meter of land. There is a moderately strong negative correlation between the two. It proves that the closer to the city (Canberra CBD) a suburb is, the more expensive the land is. Again, as seen in graph 2, the difference between the range and IQR on the x-axis are quite large suggesting a large variation in some suburbs. The IQR and the standard deviation are quite close, suggesting a much stronger and even correlation in data.

Population Density - Results
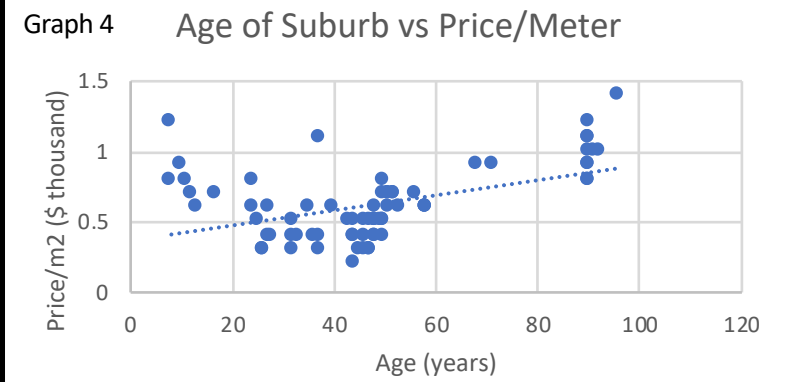
Graph 2

Population Density of Suburb vs Price/Meter

X-axis: x̄: 1584.78 **Mode:** 1500 **Median:** 1550 **Range:** 3908 **IQR:** 435 **σ:** 628.10
Y-axis: x̄: 0.63 **Mode:** 0.4 **Median:** 0.6 **Range:** 1.2 **IQR:** 0.4 **σ:** 0.26

This scatterplot portrays the link between the population density of a suburb and its corresponding price per square meter of land. It displays an extremely weak, negative correlation between the two factors. The mode and median and mean appear to be extremely close for the population density suggesting a small IQR compared to the overall range. The standard deviation shows how spread out from the mean the data is, therefore elucidating the impression of a weak correlation.

Age of Suburb - Results

Graph 4

Age of Suburb vs Price/Meter

X-axis: x̄: 47.95 **Mode:** 90 **Median:** 48 **Range:** 88 **IQR:** 20 **σ:** 22.64
Y-axis: x̄: 0.63 **Mode:** 0.4 **Median:** 0.6 **Range:** 1.2 **IQR:** 0.4 **σ:** 0.26

This scatterplot displays the correlation between the age of a suburb and the price per square meter of land. It reveals that there is a slightly weak positive correlation between these variables. It is clear to see on the graph that the mode for the x-axis is 90. The range is extremely varied at 88 years in difference though the interquartile range of 20 shows that the majority of suburbs are around the age of 50, though almost all of them appear below the line of best fit (rather than closer to it) suggesting that age isn't a large factor.

Relevance

The central tendency, range, IQR and standard deviation all help when concluding which factors influence the price of land. They each help us to decide which price of land is the best value for money when adding in practical factors such as the distance from the city and population density.

The mean helps us to decipher if the land is cheap or expensive for it's size in correspondence to similar blocks in other suburbs. It can also help to determine how far away from the city you are than the average person, the population density of your suburb compared to others and whether your suburb has been recently developed or been here for many years - all effecting the price of land in some way.

The mode allows us to see which value is the most popular, helping our understanding of how different factors can influence the price. The median helps to pinpoint exactly where each block of land and stands in terms of the value being investigated. While it may be below average in a factor, the median may tell you that you are in an upper quartile.

The range allows us to see the large difference in variation between values of each factor though the IQR is often seen as a better measure of spread as it is not affected by outliers. This can help gain a better understanding as to where a specific factor stands.

The standard deviation are measures of the spread of the data around the mean. It summarises how close each observed data value is to the mean value allowing a better insight into each property.

Each of these are factored in to determine the appropriate price for a property.

Conclusion

To conclude, this data provides evidence for the leading factors influencing the price of land in the Australian Capital Territory. In graph 1, it can be seen that there is a weak positive correlation between the size of the block and the price of the block. Graph 2 shows that the population density of a suburb has an extremely weak negative correlation against the price per square meter of land. As can be seen from graph 3, the further away the suburb was from the city, the average price per square meter of land decreased. Additional to the distance from the city, the other leading factor was the age of the suburb which is seen in graph 4. Graph 5 depicts the average price per square meter of land for every suburb used in the study. It is the foundation for graphs 2, 3 and 4. In summation, the statistical data confirmed our prediction of both the factors of size of land and location of property will effect the price of land in the Australian Capital Territory. The leading factors are the suburb's distance from Canberra's CBD and the age of the suburb. Though, the overall size of the block and the population density of the suburb had a minimal effect on the price.

Limitations with the data included a slight inaccuracy with the primary data collection as it isn't specifically the land for sale, it was a property with a house on it. A separate deemed value for the land (the unimproved value) has been used in this experiment which sets a limitation on the quality of the data. Another issue involved with the collection of data is that the sample space is quite small. According to the 2016 census, there are 145,229 households in Canberra; only 200 of which were involved in this inquiry. Improvements for further studies for this inquiry would be gaining a much larger sample space. The 200 houses used seems too unreliable for a quality result. Using primary data from only blocks of land for sale rather than the UV value for houses would also improve the quality and accuracy. Additionally, more recent secondary data in population density would have also helped as the 2016 census may already be very outdated and inaccurate. In addition to this, including all 119 suburbs rather than a sample space of 73. Upon researching this question further online, property blog websites 'Planning Tank' and 'Home Guru' both say that location and demographics affect land value. Additionally, physical attributes, neighbourhood amenities, supply and demand and economic growth also affect the price of land; all of which could be studied further in another inquiry.

Average Price per Suburb - Results

Graph 5

Average Price per Square Meter of Land
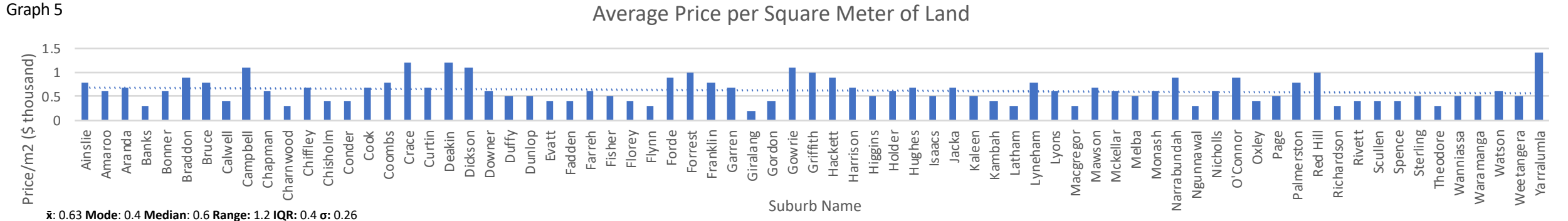
x̄: 0.63 **Mode:** 0.4 **Median:** 0.6 **Range:** 1.2 **IQR:** 0.4 **σ:** 0.26

Whilst not a factor answering the question, this bar graph offers insight into the average price per square meter for land in different Canberra suburbs. These averages are the evidence upon which the above graphs are based on. The trendline shows us that the average price is $630 per square meter and easily allows us to see which suburbs are on average more expensive than others. The large difference between the range and the IQR suggests that there are a few outliers . The standard deviation allows us to summarise how close each observed data value is to the mean value. The mode though is only just 66% of the average, suggesting that there is a very large data range.

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