House Renting in Brazil

U.A.B.M. Gunasekara
S14330
Case Study I
IS 3005 – STATISTICS IN PRACTICE

Abstract

This study is about Renting houses in Brazil. How total rent amount varies with the city? Is the area of the house relating to keeping animals in the house? How does the percentage of having a furnisher in the house change with the city? How percentage of keeping animals accept change with the city? Is No. of Rooms relating to the Rent Amount? Are the five research questions that this study is based on.

The data set used for the study has contained 10692 observations with 358 duplicates and 13 variables. Among the variables, there are quantitative data, qualitative bivariate, and univariate data. Analysis of this study is completely based on descriptive statistics methods. For the complete analysis, IBM SPSS Statistics 25 software is used.

Conclusions made from this analysis are as below. Houses in Sao Paulo city have the highest total rent amount and Campinas city has the lowest. Among these five cities, the highest number of houses have in Sao Paulo. The area of the rent houses positively relates to keeping animals. Houses in Belo Horizonte and Campains cities have the highest percentage of not furnished houses. Houses in Porto Alegre city has the highest percentage of keeping animal is accepted. But considering overall cities percentages of accepting keep animals in the house is not very vastly. The rent amount of the houses moderate and positively relates with the number of rooms in the house.

Table of Contents

List of figures and tables

1 Introduction

Brazil is the largest country in South America. Because of traveling difficulties and geographical reasons about 82 percent of people in Brazil live in urban areas. Most of the foreigners stay in larger cities like Rio de Janerio or Sao Paulo. And some smaller cities like Belem and Porto Alegre also. The cost of living varies vastly among cities.

In general house rent of Brazil can be divided into main three parts. private rentals from an owner, assisted private rentals with the help of an agent or short-term rentals from an owner or company are the three categories. According to Brazilian rental law, many short-term rentals are apartment shares. That type of place is not good for foreigners. Especially those who come with their families. For that kind of requirement, the best thing is to contact an agency that specialized in working with foreigners.

Normally for long-term rental, renters will be asked for two or three months' rent as a deposit. For short-term renters, the person who rent will be asked only one month deposit. Less than 30 months' rents are considered a short-term rentals. However, for foreign people, companies often ask for a 50% down payment from the agreed period.

As mentioned above there are many areas that should be considered when renting a house in Brazil. A data set that contained thirteen variables that going with the Brazil houses going to rent and 10000 observations, is used to conduct the study included in this report.

Following research questions are mainly focused.

1. How total rent amount varies with the city?
2. Is the area of the house relating to keeping animals in the house?
3. How does the percentage of having a furnisher in the house change with the city?
4. How percentage of keeping animals accept change with the city?
5. Is the number of rooms relates to the rent amount?

The significance of the study is analyzing the data set about house rent in five cities in Brazil and come with better solutions for the above five research questions and identify the association between variables that are described by the above five research questions.

2 Theory and Methodology

As the very first step before starts the analysis by looking at the variables better understanding of the data set was gained.

Then five research questions were made to conduct the descriptive analysis further related to the topic.

Duplicate observations are removed for a better accurate result.

Then variables were identified that related to the research questions. After those variables were separated as quantitative and qualitative. And dichotomous variables among qualitative variables were also identified.

Because this analysis was based on descriptive statistics quantitative data boxplots, Scatterplots were used, and for qualitative data bar charts and pie charts. Stacked bar charts were used to see the relationships among qualitative and quantitative variables.

IBM SPSS Statistics 25 software was used to do every analysis in this report.

There were several outliers in some of the variables in the data set. Removing outliers is not without any investigation about the background was not a good idea so the analysis was conducted keeping the outliers.

For better interpretation floor (qualitative variable) variable was recorded into a different qualitative variable. "-" sign in the floor variable taken as ground floor 1 was given to it and every other observation was incremented by one.

In some of the scales of the graphs of the x and y-axis were changed to get a better picture to compare the variables easily. Some axis of the graphs had gone very far from other values because of the outliers. Re-scaling the axis was very helpful for doing a better comparison among variables.

3 Data

The data set is about details about renting houses in Brazil. There are 10692 observations and were 358 duplicates. 13 variables were included in the data set. For the analysis, only 7 variables were used.

Variable	Description
City	City where the property was located. This is a categorical variable that contained five cities. "Belo Horizonte, Campinas, Porto Alegre, Rio de Janeiro, Sao Paulo" are the five categories.
area	Property area. This is a quantitative variable that contains the area covered by the property.
rooms	Quantity of rooms. This is a discrete qualitative variable that contained no rooms in the house.
Keeping animal	Whether pets are allowed or not. This is a qualitative dichotomous variable.
furniture	Whether furnished or not. This is a qualitative dichotomous variable.
Rent amount	Rent amount (R$) of the house. This is a quantitative continuous variable.
Total rent	Sum of all values (R$). This is a quantitative continuous variable contain the sum of rent amount, property tax, homeowners' association tax, and fire insurance value

Table 1:Variable description table

4 Data Analysis

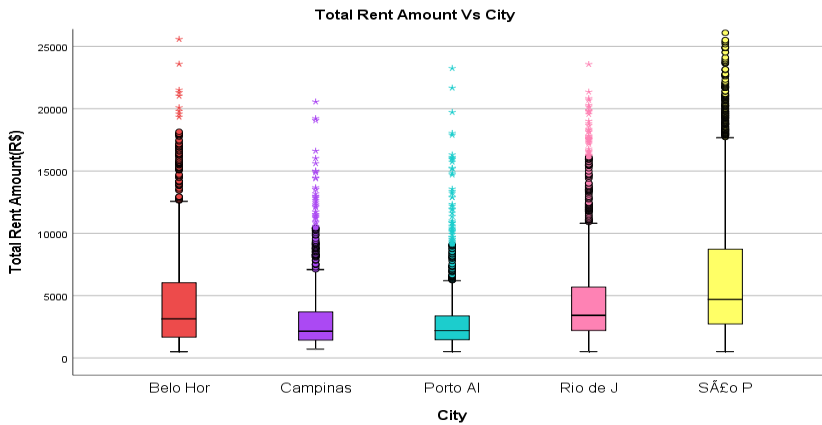## 4.1 How total rent amount varies with the city?

Figure 4.1.1: Multiple boxplots of Total rent amount Vs City

According to figure 4.1.1, Sao Paulo has the highest total rent amount and Rio de Janeiro has the second-highest total rent amount. Porto Alegre has the lowest total rent cost. There are some outliers in every category. It may cause various causes. Places that house situated, transportation facilities, Comfortableness of the house, etc. Without knowing the background, we cannot remove outliers.
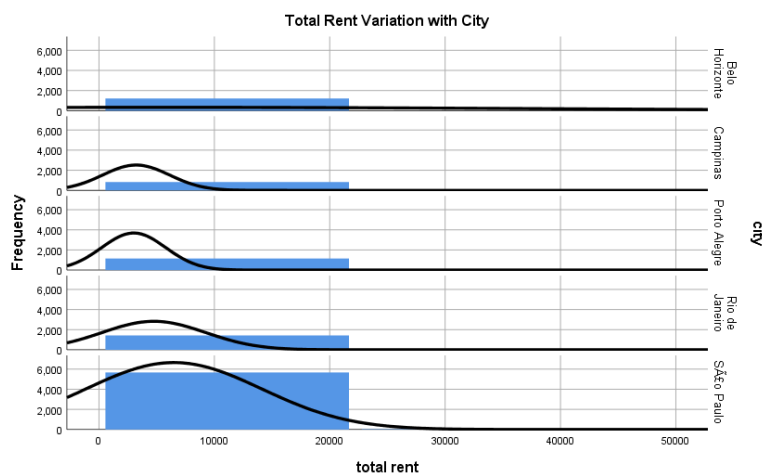

Figure 4.1.2: Histogram of City Vs total rent amount

According to figure 4.1.2, Sao Paulo city has more houses that have higher total rent amounts. The second one is in Rio de Janeiro. And Belo Horizonte city houses have good variance in total rent cost.
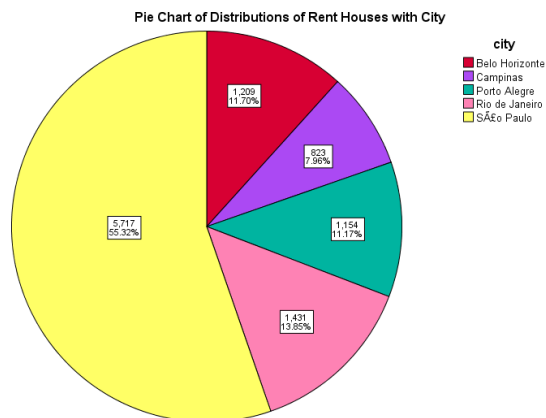

Figure 4.1.3: Pie Chart of Distributions of Rent Houses with City

According to figure 4.1.3 Sao Paulo city has the highest number of houses to rent. The second highest city in Belo Horizonte. Campinas city has the lowest no of houses to rent among these five cities.

According to the above three graphs, Sao Paulo city has the highest number of houses to rent but a considerable amount of the rent cost is higher. Belo Horizonte, Porto Alegre, Rio de Janeiro cities have approximately the same percentage of houses to rent. Among them, Belo Horizonte city has a fairly distributed price range than others. In the other two cities number of higher rent amount houses amount is high.

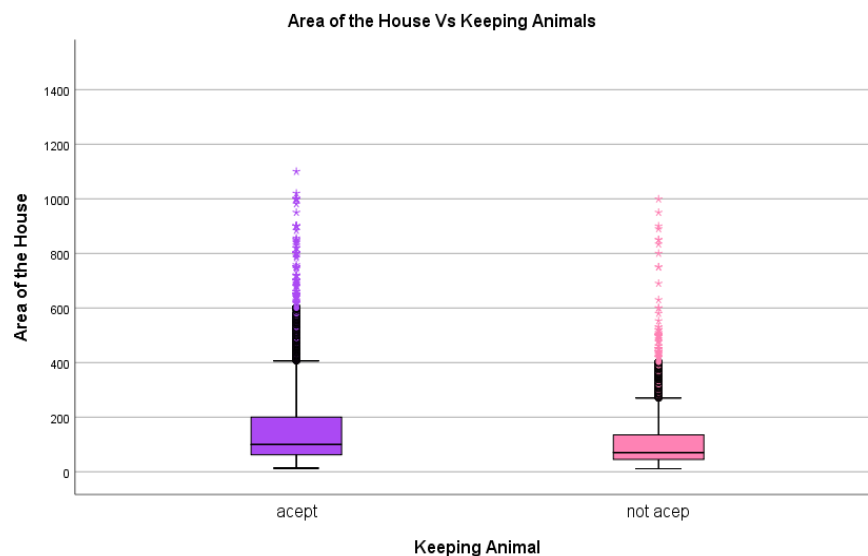## 4.2 Is the area of the house relating to keeping animals in the house?

Figure4.5.1: Boxplot of the area of the house Vs Keeping Animal

According to figure 4.2.1, there is a significant association between the area of the house and keeping animals accept or not. The area of the keeping animal accepted house is greater than the not accepted.

When the area of the house is large animals can behave freely. If the person who lives in that house can arrange a separate place for the animal. And the noise of the animal will not be heard by the neighbor also. So that large are is more suitable for keeping animals than a house that have a small area. In both cases, there is a bit number of outliers without considering the background outliers can not be deleted. It may be caused because of some rules and regulations of the house owners associations. Some associations may permit to keep animals some may not.

4.3 How does the percentage of having a furnisher in the house change with the city?
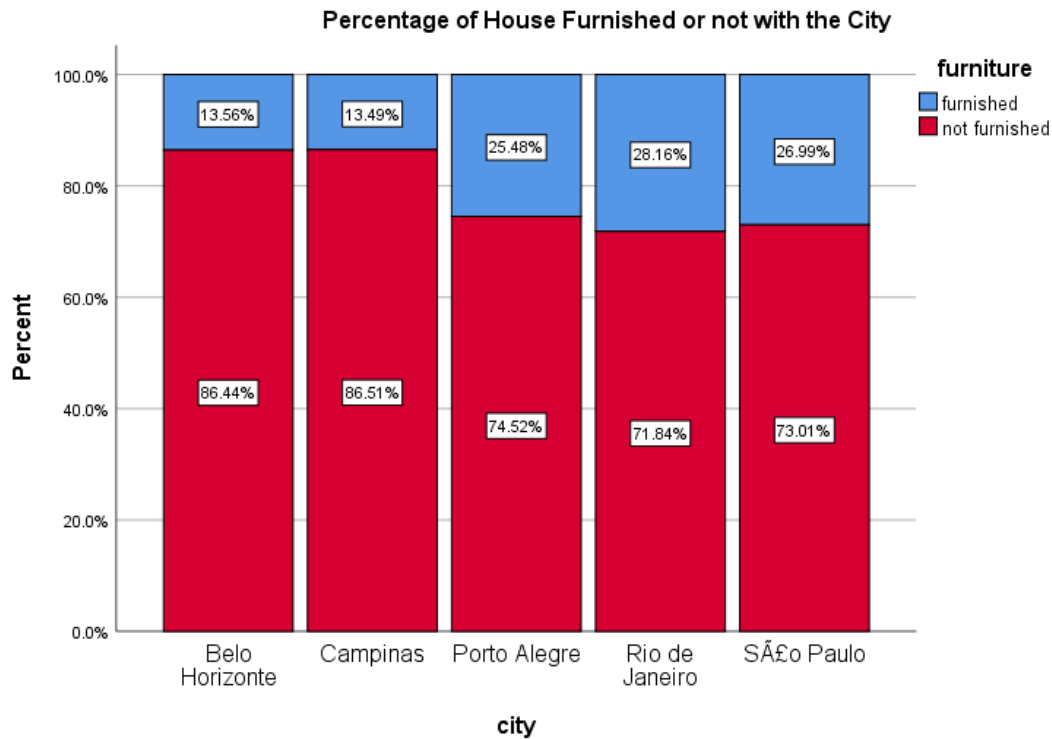

Figure 4.9.1: Percentage of House Furnished or not with the city

According to figure 4.3.1 comparison of furnished or not house with the city shows that 86% of houses in Belo Horizonte and Campinas cities are not furnished. But houses in Porto Alegre, Rio de Janeiro, and Sao Paulo have been not furnished are 74%,71%,73% respectively. Belo Horizonte and Campinas cities are no urbanized than the other three cities. Most of the foreigners choose Sao Paulo or Rio de Janeiro cities to stay in so that may be the case of furnished house percent is higher in that two cities.

4.4 How percentage of keeping animals accept change with the city?

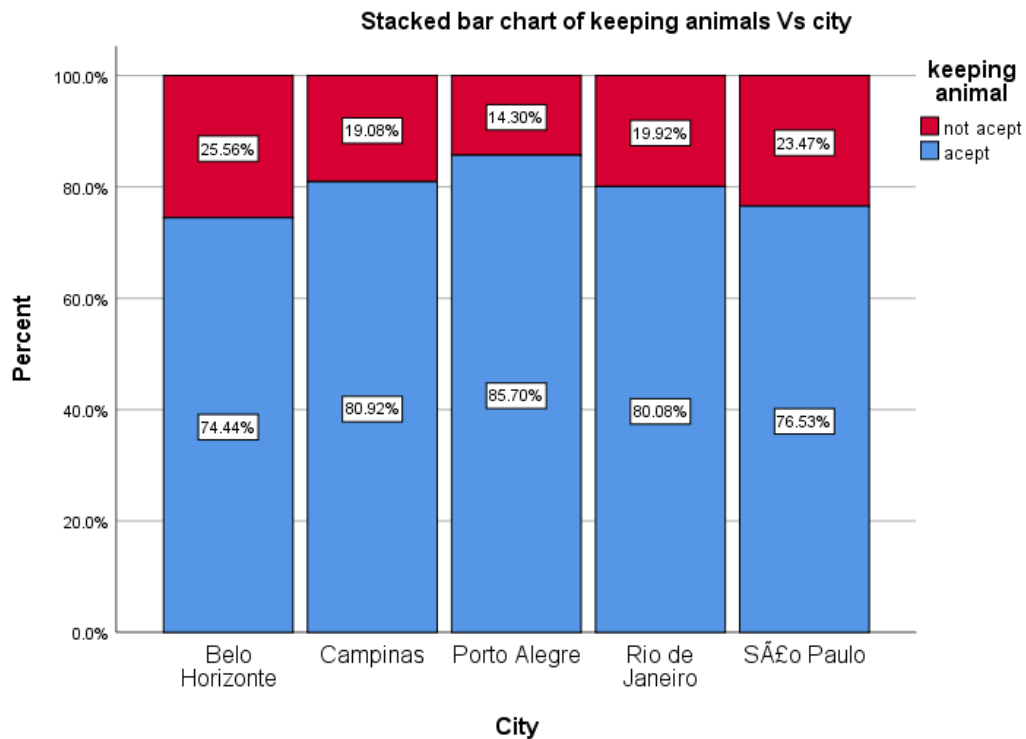**Stacked bar chart of keeping animals Vs city**

Figure 10.4.1: Sacked bar chart of keeping animals Vs city

According to figure 4.4.1 comparison of keeping animals accept or not in a house with the city shows that 86% of houses in Porto Alegre are accepting animals. That is the maximum percentage among cities that animals accept. Both Belo Horizonte and Sao Paulo animal acceptancy are lower. When considering the whole picture except one city other 4 cities accept animal is greater than 75%. Another one is very closer to 75%. So that city is not related to the keeping animal in a rent house in these five cities in Brazil.

4.5 Is No. of Rooms relates to the Rent Amount

Rent amount Vs No. of Rooms
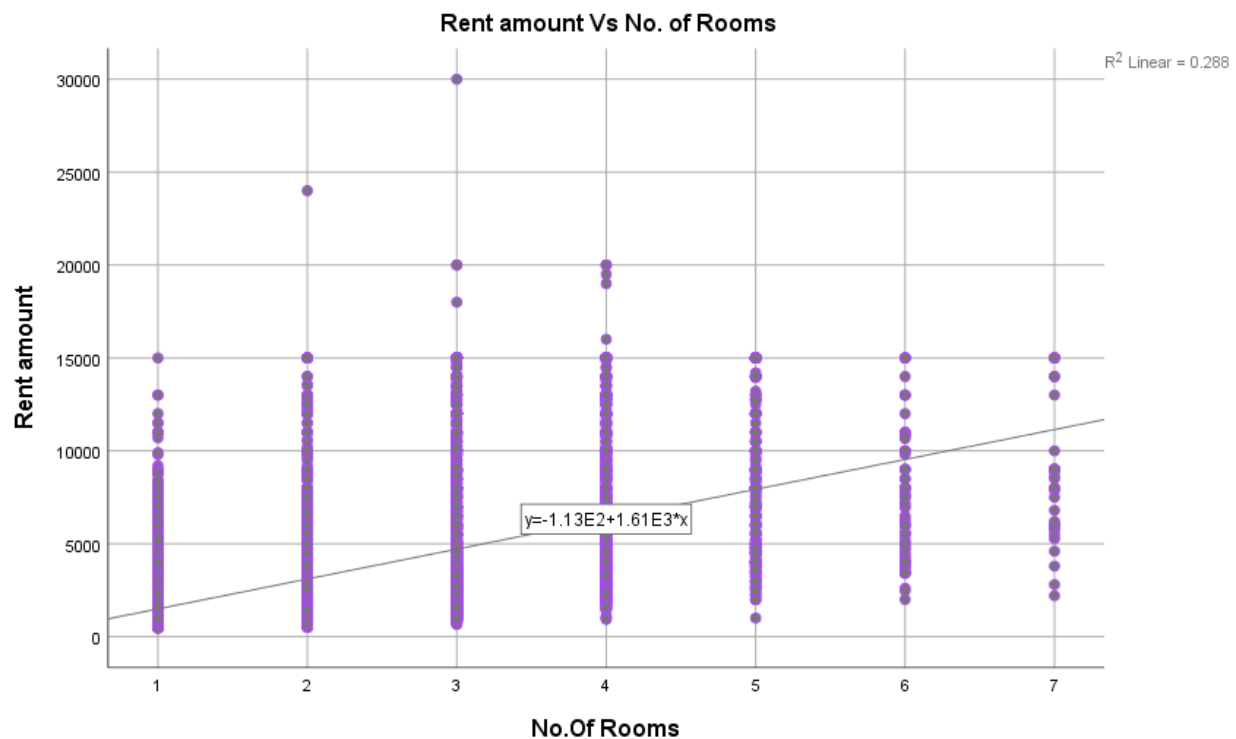
R^2 Linear = 0.288

y=-1.13E2+1.61E3*x

Figure 4.5.1: Scatter plot of Rent Amount Vs No. of Rooms

According to figure 4.5.1 rent amount and the number of rooms are moderately relets. Because r is equal to 0.536 according to output (R^2 = 0.288). As the normal scenario when the number of rooms is increases capacity of the rent house also increases for increase the capacity house should larger so rent house may increase. In this scatterplot from 1 to 4, there is a clear increase but from 4 to 7 there is some kind of decrease. When houses become larger facilities in the house may be reduced because of that reason rent of houses that have larger no of rooms may little bit lower than houses that have higher facilities.

There are some outliers in this plot it may cause because of the rental amount of high comfortable houses. Houses that are air-conditioned and have luxury bathrooms etc. In that type of house though the number of rooms is lower rental price may higher because of facilities.

5 General Discussion and Conclusion

- According to the results of the first question "how total rental amount vairy with the cities?" Sao Paulo has the highest rent amount among these five cities and Campinas has the lowest rent amount. Sao Paulo and Belo Horizonte cities total rent amount have a higher range than other 3 cities. In hat two cities houses percentages also high than other three. So, a person who finds a house to rent has many choices in those two cities with the high price range.
- According to the result of question two keeping animals and the area of the house is related. Because the high amount that accepted the keeping animals have higher area
- According to the analysis in question, four-city is not related very much to keeping animals in the house. So, people who expect to keep animals in the rent house city is not matters they should look for a house that has a high amount of area.
- Results of question three show us houses in the big cities among these five cities, percentage of the house is furnished is higher than other small cities. If a foreigner is looking for a rent house among these five cities Sao Paulo o Rio de Janeiro cities are the best according to this perspective. And most of the people except foreigners rent a house from a city because of the easiness of reaching to the workplace. So, they do not want many furnishers and bring furnisher from the home town also a big problem for them buys furnishers from the cities also costly. So that many people search furnished houses. That may be the case for the percentage of houses in the big cities that have furnishers.
- The result of the last question is very practical. Normally rent amount is positively related with no of rooms. When the numbers of rooms increase the area of the house, the number of people live, the number of bathrooms, etc. increases. That may be the cause of high rent costs. Normally capacity of the house is increases facilities may decrease that may cause to moderate correlation. Although there are a low number of rooms rent of some luxury houses may be higher. The major cause for the outlier of that analysis may be caused by that type of house. Some foreigners are looking for that type of house so surely that type of house is present in this data set.
- According to the five research questions, these are the conclusions that can come up. More variables are not used from this data set. Using that data variable many more conclusions may be drawn.
- There were several outliers in this data set without any investigation that outliers cannot be removed. Without any knowledge about these cities that type of investigation could not be done. So these all analyses were done keeping that outliers.