Canadian Real Estate Rental Market – Artificial Hype or Reality?

Airbnb vs Traditional Rental Market

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ABSTRACT

Recently, an artificial hype in real estate rental market has been observed, especially over the period of past 5 years, whereby the rental of a reasonable accommodation is almost out of budget for a middle class. The Government of Canada has been taking initiatives to increase the availability of rental property in mega cities of Canada e.g. Vancouver and Toronto.

"The City of Vancouver announced on Wednesday that it is moving to ban all Airbnb and short-term rentals in secondary homes in the city. Mayor Gregor Robertson says they expect about 1,000 rental units to get returned to the market." [1] In continuing efforts to crack down upon short term rental loom through Airbnb, Toronto passes strict Airbnb rules aimed at preserving long-term rental supply [2].

In this project, we are aiming to analyze how this short-term rental service Airbnb is causing a shortage in long term rental vacancies. Underlying assumption is that it has also inflated the hype in rental market. This project is an in-depth exploratory and diagnostic analysis of an interesting dataset that provides insights of the data combined with a data analytics and visualization solution that can be scaled to massive datasets.

The geographical scope of this study is Canada, specifically Vancouver and Toronto. This project aims to analyze percent increase in rental [2] of apartments of different size and vacancy rate, in two mega cities of Canada. We will also get an insight of ownership of house(s) e.g. how many houses or secondary house units are on listing for short term rental.

KEYWORDS

Analytics, Visualization, Short & Long Term Rental, Investment, Vacancy, Availability, Income, Airbnb,

1 Motivation and Domain Description

This project aims to analyze huge datasets of Canadian Mortgage and Housing Corporation (CMHC) and Airbnb leading to various dimensions of analysis.

1.1 Data Domain

The data source for this project is: Statistics Canada, Canadian Income Survey 2012–2015, Survey of Labor and Income Dynamics 2006–2011. This data is publicly available on Canadian Mortgage and Housing Corporation (CMHC) [3].

Another data source for this project is "Inside Airbnb". The data behind the Inside Airbnb Web Portal is being sourced from the publicly available information provided by Airbnb.[4] "Inside Airbnb" is an independent, non-commercial set of tools and datasets that allows to explore how Airbnb is really being used in cities around the world. By analyzing publicly available information about a city's Airbnb's listings, "Inside Airbnb" provides filters and key metrics so as to check out how Airbnb is being used to compete with the residential housing market.

The data source for this project is a combination of multiple data files. The dataset is in MS Excel format and it has Listings.csv, Reviews.csv, Calendar.csv, Neighbourhood_geo.json data files in consideration. Listing data contains following attributes (3533 rows) for short term Airbnb rentals [4]:

- **Name**
- **host_id**
- **host_name**
- **neighbourhood_group**
- **neighbourhood**
- **latitude**
- **longitude**
- **room_type**
- **price**
- **minimum_nights**
- **number_of_reviews**
- **last_review**
- **reviews_per_month**
- **calculated_host_listings_count**
- **availability_365**

The data file Reviews.csv contains 456822 or more reviews and contains comprehensive reviews of each listing. We have same amount of information for both cities, Vancouver and Toronto [4]. This data is available from **June 07, 2015 to December 6, 2018**. We should consider the following features for long term rental housing investment:

Canada Mortgage Bonds (CMB), Mortgage-Backed Securities (MBS), Covered Bonds Market, Sales and Stock of Rental Properties, Private Mortgage Securitization [3]

These long term investments especially in Toronto and Vancouver up to the year 2036 will be explained by the type of household, age group and income. We will build housing indicators in relation to *Population, Labor force participation rate, Employment and Unemployment rate, Net migration [3]*

We will demonstrate how short time rental is lowering the long term vacancy rate, increasing rentals and harming market rental properties. The major focus will be given on:

Average rent increase in urban and rural areas, Availability Rates, Vacancy Rates, Total number of units in size, Ethnicity owning the house [3]

1.2 Goal of our project

The goal of this project is to perform rigorous analysis of rental market over past five years; and the trend of percent increase in listings for short term rentals available on Airbnb. We will compare two cities for popularity among tourists for kindness of owner, cleanliness of the rental property, how satisfied they were on expiry of their rental agreement. We also want to predict the trend of increase in rentals and prices of houses for next 5 years.

1.3 Motivation for rigorous data analysis in this domain

The motivation is to conclude if there is any relationship between Airbnb, recent rental hype and shortage of rentals for long term lease in Toronto and Vancouver. Another motivation is to predict if Airbnb would be able to scale up in Canada or be forced to restrict its operations in Canada as directed by City Government.

1.4 Questions we want to answer

Does this short-term rental service "Airbnb" has a vivid impact on long term rental vacancy? To reflect the Airbnb rentals within the whole rental market scenario, we will analyze how these short and long term rental investments are affecting renters and market prices. The immense budget in long term housing investment is getting harmed by short term Airbnb rentals.

1.5 Why this analysis is important?

This analysis is significant to evaluate if Canadian City Government is taking correct steps by passing strict rules and revised strict licensing terms with Airbnb; "such as charging tax per night".

2 Methodology

2.1 Type of data analysis we will perform

In this project, we shall perform descriptive, exploratory, inferential, diagnostic and predictive data analysis with significant focus upon inferential and predictive data analysis models.

2.2 Data analytics methods we will employ

Our project shall leverage several data analytics methods, including time-series forecasting, regression models and further, prediction methods.

2.3 Steps we need to perform

Data Collection: We are scraping data from Airbnb Web Portal, more specifically from "Inside Airbnb".

Data Cleansing and Pre-Processing: We are planning to perform the data cleansing of datasets using Open Refine [6], Google Cloudprep and Python [5].

Data Analysis: Python programming language shall be leveraged, along with powerful Python libraries such as Pandas and Numpy [5].
Data Visualization: Tableau[7] and D3 (Data Driven Documents) shall be leveraged for data visualization, besides using most popular Python libraries such as Matplotlib and Plotly [5].

Sentiment Analysis: This shall also be performed upon Reviews from several Review Web Portals and Boards using Python [5].

3 Evaluation

3.1 How will we evaluate our data analytics system?

In this phase, we shall evaluate the algorithms used, the data included, the features selected for analysis, and the statistical techniques and methods applied, by monitoring the accuracy of the model's performance.

3.2 What other datasets can be used?

This project can be scaled up by analyzing the investment datasets to find out if people are considering real estate for investment or residence.

ACKNOWLEDGMENTS

Canadian Mortgage and Housing Corporation [3], Airbnb [4]

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