

# Metro Vancouver Condo Market: The Past and Future

## ABSTRACT

- We investigated the effects of the BC Immigrant Investor Program (IIP), Empty Homes (EH) Tax, First Time Home Buyers Program (FTHBP) and 15% Foreign Buyers (FB) Tax on condo prices in three regions of Greater Vancouver.
- Random forest model was used to predict price based on multiple characteristics associated with a given condo.
- We factored in rent statistics to give a recommendation with respect to investment quality in various types of condos in the three areas.

## INTRODUCTION

- Aim:** Predict the monthly resale condo price per square foot for the 12 months in 2018 in Collingwood, Metrotown and Whalley, and deliver an investment recommendation.
- 11851 condos were included in the analysis.
- Variables within the data:
  - Age
  - # bedrooms
  - # bathrooms
  - # parking spaces
  - Contains locker
  - Floor area
  - Floor number
  - Strata fee
  - Distance to Skytrain
  - Interest rate
  - Currency exchange
  - List date
  - Days on market
  - Bylaw restrictions
  - Policies in effect



## METHODS

- Exploratory Data Analysis (EDA): used to visualize the main characteristics of our data
- Random Forest: used to build a predictive regression model that takes various variables into account
- Return on Investment (ROI): used to determine investment potential using rent income

## RESULTS

Fig1: Government Policy Effect - Collingwood

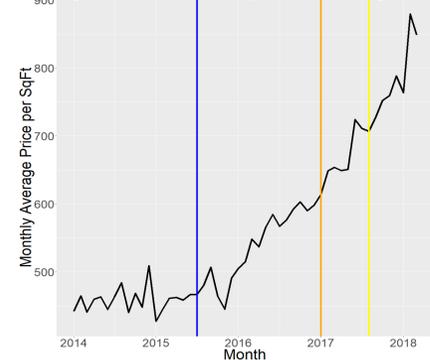


Fig2: Government Policy Effect - Metrotown

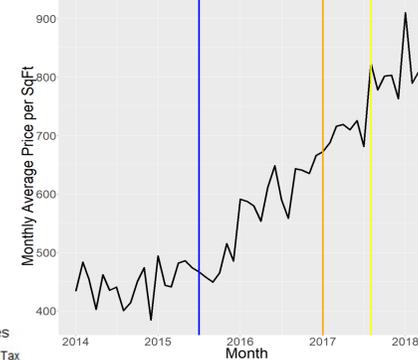
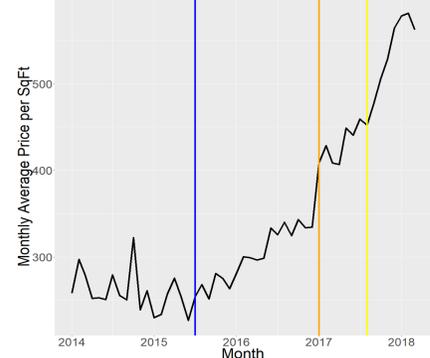


Fig3: Government Policy Effect - Whalley



Gov Policies  
 15% FB Tax  
 BC IIP  
 EH Tax  
 FTHBP

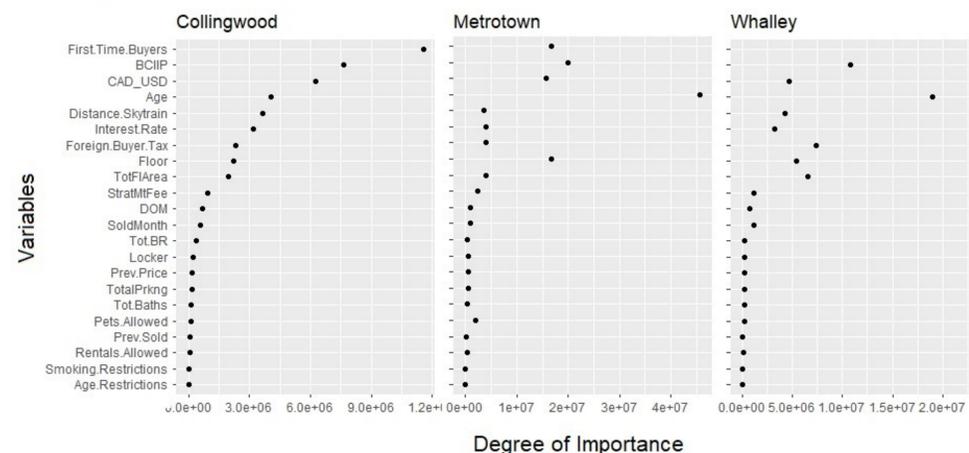
### EDA – Government Policies

The three regions showed similar trends from 2014 to 2018. BC IIP boosted the condo prices. Foreign Buyers Tax seemed to work in Metrotown for a period of time, but eventually the condo prices for all regions increased faster than before. Whalley is a relatively new market; the price did not climb too much until late 2016.

### Random Forest Prediction

- A random forest model was fitted with 100 trees on each of the areas.
- Cross-validation was performed, with error calculated using the Mean Absolute Percentage Error (MAPE).
  - Collingwood: **5.9%**; Metrotown: **6.7%**; Whalley: **6.3%**
- Age, distance to the closest Skytrain station, and time-dependent factors such as policies in effect and currency exchange rate helped reduce model error and were considered to be important factors.

Fig4: Variable Importance Plot



## Investment Quality by Area and Type

- Price-to-rent ratio is a common way of assessing whether property price is overvalued.
- Average annual return on investment (ROI) was calculated using the average annual rent income, less the average strata fee, divided by the average condo price.

Neighborhood	Type	AvgRent	AvgPrice	AvgStrata	Price:Rent	ROI(%)	Recommendation
Collingwood	Studio	\$1,046	\$311,312	\$165	24.80	3.40	Very Good
Collingwood	1 Bed	\$1,118	\$421,796	\$229	31.44	2.53	Good
Collingwood	2 Bed	\$1,458	\$540,103	\$314	30.87	2.54	Good
Collingwood	3+ Bed	\$1,337	\$634,762	\$391	39.56	1.79	Poor
Metrotown	Studio	\$1,027	\$415,000	\$205	33.67	2.38	Fair
Metrotown	1 Bed	\$1,112	\$484,863	\$218	36.34	2.21	Fair
Metrotown	2 Bed	\$1,404	\$658,872	\$308	39.11	2.00	Poor
Metrotown	3+ Bed	\$1,764	\$812,200	\$337	38.37	2.11	Fair
Whalley	Studio	\$835	\$228,954	\$153	22.85	3.57	Excellent
Whalley	1 Bed	\$908	\$282,037	\$224	25.88	2.91	Good
Whalley	2 Bed	\$1,077	\$368,506	\$306	28.51	2.51	Good
Whalley	3+ Bed	\$1,213	\$444,090	\$389	30.51	2.23	Fair

## CONCLUSIONS

### Exploratory Analysis

- The BC Immigrant Investor Program was a catalyst for the growth of condo prices. Subsequent government policies that aimed towards increasing affordability did not work as expected, as the Foreign Buyers Tax did not stop the condo market from becoming even hotter than before.

### Random Forest Prediction

- We can predict the price of a specific condo with a MAPE of around 6 to 7%.
- Some of the most important variables were policies, currency exchange rate, distance to Skytrain station, and age.

### Investment Quality

- We recommend Collingwood and Whalley studios for investment purposes based on average ROI.

## REFERENCE

- MLSLink ([idp.gvfv.clareitysecurity.net](http://idp.gvfv.clareitysecurity.net))
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- Bank of Canada Interest Rates ([www.bankofcanada.ca/rates/](http://www.bankofcanada.ca/rates/))
- Canada Mortgage and Housing Corporation ([www.cmhc-schl.gc.ca](http://www.cmhc-schl.gc.ca)) – Vancouver CMA Rental Market