

Real estate price, and Policy in Canada

By

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A Research Project Submitted to
Saint Mary's University, Halifax, Nova Scotia
in Partial Fulfillment of the Requirements for
the Degree of Master of Applied Economics.

August, 2018, Halifax, Nova Scotia

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Approved: Dr. Joniada Milla

Date: August 15 2018

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Author Note

This research project is submitted to Dr. Joniada Milla as part of the requirements for the completion of Master of Applied Economics at the Department of Economics, Sobey School of Business, Saint Mary's University.

Abstract

Canada is a country with many immigrants, its advantages attract many immigrants. Immigration brings a lot of benefits but also has some impact on local residents. Let's say the house price. The increase in immigration is one of the possible factor to cause the rise in house prices. Some provincial governments in Canada have made policies to restrain rise in housing prices. For example policies carried out on Budget 2016 and Budget 2018 by Government of British Columbia. In this paper, I look at why these policies are made and whether are they really effective.

Keywords: immigrant, housing prices, policy

1. Introduction

Canada has long been known as one of the world's most welcoming countries for immigrants, who are granted most of the same rights and freedoms as citizens. Chinese immigrants are som of the most important component of immigration in Canada, and the proportion of Chinese immigrants has a continuous upward trend over time. Canada is one of Chinese people's favorite immigration destinations. Compared to other North American and European countries, Canada has many advantages such as quality of life, education, medical insurance system, social welfare policy, stable social environment, being friendly and multicultural, and a pleasant natural environment. However, increased immigration will also lead to some problems, take Vancouver as an example, real estate prices rose too fast and many local residents being dissatisfied. Especially under the situation of: Houses are close to a necessity for the Chinese. Purchase real estate has become a must-do thing after Chinese immigrants landing in Canada. According to a report issued by the Bank of Canada, overheating of the real estate market has become

one of the two major crises in Canada's financial system (the other one is rising household debt).

The increase in real estate prices caused by the purchase of overseas buyers has affected local residents in Vancouver, leaving many local residents unable to afford housing. In response to this situation, the Government of British Columbia has begun implementing various policies to prevent excessive increase in real estate prices and reduced speculation in the real estate market. In Budget 2016, the Government of British Columbia introduced a 15% foreign buyer tax on buyer who is not Canadian to purchase real estate within Metro Vancouver. This policy came into effect on August 2nd 2016. Later, in Budget 2018, Finance Minister of BC Government, Carole James, announced that the tax policy implemented in 2016 will increase to 20 percent from 15 percent. This new tax will also be expanded to other major cities in BC. This policy is worth to exploring. Is the policy implemented in 2016 not working well so government have to increase the tax to 20 percent? This paper will discuss the possibility with empirical studies.

2. Literature Review

Vancouver is one of the cities with least affordable urban housing markets in North America which has out-sync local incomes and property prices (Dorfmann, 2015). Foreign buyers are considered as one of the most important factor in the case of rapid rise in house prices within Metro Vancouver area (Gillis, Sorensen and Macdonald 2016).

The 15% foreign buyer's tax in the Metro Vancouver area was implemented on August 2nd, 2016 after the BC Government's 2016-2017 fiscal update (2016-2017

British Columbia Fiscal Update). In this This Fiscal Update, the BC Government has displayed the change of residential transactions involving foreign nationals, the result is the percentage of this kind of transactions drop rapidly in every district of Metro Vancouver area, especially Richmond and Burnaby, which both dropped from 25% to lower than 2.5% in only around 80 days between June 10 2016 to August 31 2016.

However, some studies on this policy change shows that it seems to only regulate the price of most expensive houses. It may not affect average level buyers (Harder, 2017). Brennan also believes that the policy will increase house prices at least in terms of demand side. Harder's (2017) article use equations including variables such as total population, exchange rate between the Canadian dollar (CAD) and the US dollars (USD), housing starts and housing completions of all forms of housing to best estimate the increasing supply in the area to explain housing price index. Harder (2017) also concluded that the 15% tax of foreign buyers may not be the most useful way to regulate the housing market. However, I don't see any empirical analysis on this part. Harder's (2017) article shows that percent of foreign buyers in the metro Vancouver housing market has fall down at July 2016, however what happened on the housing price? On the other hand, as time goes on, there is more data on the housing market release. Therefore in this paper, panel data and data analysis will be used to study whether this 15% tax on foreign buyers can restrain Metro Vancouver area's house price effectively.

Speculation by overseas buyers is related to local housing demand. Take an example in Vancouver, Chinese immigrants make up one of the largest demand group, overseas buyers will be profitable because of this large demand. (Gillis, Sorensen and Macdonald, 2016). In Vancouver's example, housing price is also related to immigrant.

From National Household Survey by Statistics Canada (2011), about 20% of the Canadian population is foreign-born, that is, one in five people in Canada is born overseas. In the five years from 2006 to 2011, Canada received more than one million immigrants from all over the world. In percentage terms, the recent wave of immigration accounted for 3.5% of Canada's population, this percentage is in an increasing trend. From IRCC, Permanent Resident Data as of May 2017, Permanent Residents Admitted in 2016 who are from People's Republic of China has proportion of 9%.

According to statistics and prediction released by the Statistics Canadian (2018), not only will immigrants make up a third of Canada's population in 20 years, but more than half of them will be Asian immigrants. If combined with birth of the second generation of immigrants in Canada (i.e., the parents of at least one person was born in a foreign country), by 2036, almost one out of two Canadians are immigrants or the second generation of immigrants. In fact, in Canada's census (2011), nearly 45 percent of immigrants in Canada was from Asian. The Statistics Canada consider that if current trends continue, 55.7 percent to 57.9 percent of Canadian immigrants will be Asia immigrants by 2036. Even the nadir of the forecast is more than half.

The distribution of immigrants throughout the country is no more evenly distributed today. Migrants will still be concentrated in region around Toronto, Montreal and Vancouver. According to Statistics Canada, in 2036, more than 90 percent of migrants will live in urban areas of Canada, making the proportion of migrants in those areas higher than in other areas. For example, more than a third of immigrants will live in the Toronto area, bringing the proportion of immigrants in their total population to about half (46% to 52.8%).

If we add the second generation of immigrants, the proportion of immigrants in Toronto areas will be 77% to 81.4%, and the Vancouver area will be 69.4% to 74% (excluding the second generation, 42.1% to 48.5%). On the other hand, Chinese immigration has become an important part of some cities, for example, Toronto and Vancouver. According to the national household survey data (2011), Chinese immigrants make up 11% of Toronto's population. In terms of Vancouver in the same survey data, Chinese immigrants occupy 19% of the proportion of population. Canada's immigration system's structure is a fundamental building block of the nation. Immigration has an important effect on Canada's economy.

Reason that immigrants prefer Canada can be conclude into several reasons:

Relatively high quality of life.

Canada has been rated as the most livable country in the world for seven consecutive years. In addition, the Vancouver in British Columbia has been ranked as the most suitable city for human settlement in the world for several years, and the Toronto in Ontario was named as the one of the best international city by "Fortune" magazine.

High quality education

Canada's spending on education as a percentage of national income is among the highest in the world. Canadian universities can be found in the world's top ten universities in various fields of expertise. Free education is provided by public schools and primary schools in Canada. The university not only has a low tuition fee, but also can obtain interest-free loans and bursaries. Family members of students can enjoy tax deductions.

Medical insurance system

Canada has the best health care system in the world. Most communities have well-equipped hospitals, private clinics, or physician's offices. All Canadian residents (citizens and permanent residents) will receive free services after signing up for the National Health Insurance Plan of Canada. This plan is invested by the government (using taxpayers' taxes).

Social welfare policy

Canada has social welfare policies that other countries do not have. For example, Lifetime health insurance. As long as you are sick in hospital, regardless of the severity, all costs are borne by the government. The Canadian government gives newborn children a monthly subsidy of around 360 Canadian dollars, and Quebec has the highest figure of 560 Canadian dollars. And there are also many other welfare focus on poverty, parents and children benefit, employment, healthcare, and pensions and elder support.

Stable social environment

Canada is a country that is strictly regulated by law. Its legal system is set by the people's elected government according to the principle of parliamentary democracy. Canada is rich in resources, sparsely populated, and has high employment rate. As a result, the crime rate is low and the society is stable. Canada is called a paradise for the elderly and children by many Chinese. In developed countries, Canada's social security is second to none.

Friendly multicultural

Canada is an immigrant country that has many traditions and policies to encourage multicultural. In Canada, you can find many diets, entertainment from other cultural. Compare to U.S, Canada has almost no differences in social status caused by

different cultures. Once, a Governor of Canada was ethnic Chinese, this is the best proof of Canada's friendly multicultural environment.

Pleasant natural environment

Canada's major cities are concentrated in the Great Lakes region to the east coast of the Pacific Ocean. The population density of the city is small. Compared with other developed industrial countries in the world, Canada is almost no environmental pollution. Comparing China's current severely polluted environment, this factor may be the most important factor for Chinese immigrants move to Canada.

In the attitude of most Chinese, home is a word full of warmth and happiness, and the house is the representation of the home for Chinese. A house carrying Chinese' hope and happiness. According to Beijing housing situation investigation report, more than ninety percent of respondents think happiness is related to the house, of which 33% of people think that "House is the decisive factor of happiness". In some part of China, owns a house has become a necessary condition to get marry. General speaking, houses are different concepts in the idea of Canadians and Chinese. Houses are close to a necessity for the Chinese. A small proportion of Chinese immigrants have the behavior of speculative real estate, but most Chinese immigrants only buy real estate because of their own housing needs.

Similar to the growing number of immigrants, Vancouver's house prices have also climbed in the last 50 years. According to Data from CMHC, the average price for a single house in Vancouver has risen from c \$230,000 in 1978 to more than c \$200,000,000 at its highest level in 2016.

The Vancouver sun paper quoted Andrey Pavlov and Tsur Somerville as saying that immigration can result in higher local house prices as demand from immigrants, at least wealthy immigrants, dominates any flight by native born. In May 2016, A Chinese student bought a house in Vancouver at 31.1 million Canadian dollars break the record for the most expensive house in Vancouver in 2016. This news was widely reported and sparked social debate. On one hand, Local residents was surprised by the purchasing power of the Chinese, on the other hand, local residents impute foreign investors, especial Chinese push up local estate prices is the main reason that they can't afford to buy a home. According a research by British Columbia government, 10,148 real estate transactions took place in the entire province from June 10-29, 2016, and 258 is bought by investors from mainland China, accounting for 2.54% of the total transaction volume. However, some people questioned the authenticity of the data. On the other hand, according to the report of benchmark house price increase in major Canadian cities within five years of the release by the Ottawa Real Estate Board, real estate prices in Toronto have increased by 68.2% within past five years, this number is 59.5% in Vancouver. With the rapid growth of house prices in Vancouver and Toronto, there are also many Chinese immigrants who are considered speculative by local people. That is, local people believe that many Chinese immigrants buying at a house at low price and selling it at a high price after a price increase.

According to a report issued by the Bank of Canada, there are two major crises in Canada's financial system: rising household debt and overheating of the real estate market. The speculative behavior in the Canadian real estate market has considered

brought about huge problems and forced the government to make a determined effort to rectify it.

In fact, government of British Columbia has carried out the policy of 15% foreign buyer tax on buyer who is not Canadian to purchase real estate within Metro Vancouver as early as 2016 August.

Interestingly, 2 years after, The New Democratic Party (NBC) government of British Columbia announced the 2018 Budget, and a series of changes aim at the policy they made in 2016 and proposed a series of new policies including affordable housing plans which are the most stringent Canadian policies ever to crack down on real estate speculation behavior. This series of new policies can be mainly concluded into five points:

1. New Speculator Tax

In Budget 2018, the BC government announced that it would be introducing legislation to impose an annual speculation tax. The new Speculator Tax is targeted at foreign and local house owners who have evaded income tax in British Columbia. This tax will be effect from fall 2018, with an initial tax rate of 0.5% and an increase to 2% in 2019.

The provincial government stated that most house owners do not need to pay this tax. However, for those who have huge overseas income and do not pay taxes in BC will be subject to speculative taxes. The provincial government also warned that strict audits will be conducted to ensure the implementation of this tax. Reasons for those policy changes are because many families with luxury houses in BC but declare with low income. Therefore, the government of BC suspects that many luxury house owners do not report

overseas income. Almost at the same time, Canadian Imperial Bank of Commerce (CIBC) recently terminated the policy of "Overseas income application for housing loans do not need income certification".

2. Raising Land Transfer Taxes for Luxury Homes

From February 21, 2018, the transfer tax in British Columbia for houses with a market value more than 3 million Canadian dollars will increase from 3% to 5%. At the same time, the provincial government has also raised the school tax for these houses. The government's signal is clear: luxury houses are only suitable for those who can afford it.

This policy seems to be targeting rich people, but it is actually to solve a particular problem in Vancouver. Many of the old local houses were speculatively regarded by the speculators and intended to be demolished and reconstructed into luxury houses, reselling for more than 3 million. There is a local civil society criticizing that Vancouver is losing a large number of historic houses. This policy is to ensure that the purchase of a house is for a living purpose. If it is for real estate speculation, then the speculator will have to pay a higher price.

3. Overseas Buyer's Tax Increased to 20%

From February 21, 2018, BC raised the overseas buyer's tax for Metro Vancouver to 20%. The tax also extends its affect area to the Capital Regional District, Fraser Valley, Central Okanagan and Nanaimo Regional District. This policy is to prevent overseas speculators from turning their target to markets around Vancouver suburb.

This policy is in order to rectification the situation that in BC, there is one overseas buyer for every five condo buyers. Condos are the rock bottom for buying a home but many local young people have good jobs but still cannot afford a condo in

Vancouver. To make matters worse, one-fifth of overseas buyers only own the condo when the condo is still being presale and then resell contracts. That is the reason that government need the policy I will talk about next.

4. Cracking down on speculation

The government of British Columbia has mandatory register condo buyers' files. Before this policy been implement, only developers knew who was buying condo and speculation. Now, the government can know who is buying and selling, the frequency of trading, and where buyer and seller come from. With this policy, government can make sure that speculator pay more taxes. This file will also be shared with the Canadian Federal Revenue Service.

The reason on this policy change is that, only 5% of the down payment is enough to speculative condos. In Canada, condo presale contracts have become a derivative of the real estate market. For example, someone bought a condo at a price of 1 million and paid only \$50,000 down payment. Before the down payment expired, if this person sold the condo at 1.05 million, then there will be \$50,000 profit for this person. The policy is that, if this person trade in that way frequently, he or she should be taxed as an investment business.

5. Reduce anonymous house owners

British Columbia is tracking house owners who actually benefit from the property. Land Title and Survey Authority will collect more information on the trade of the house. The information bank established by the provincial government will be disclosure to the public. Those information will also be shared with the Canada Revenue Agency and the police department to ensure that owners are law-abiding.

Reason on this policy change is, at present, no one knows what will cause by the problem of anonymous owners. However, according to data from Transparency International Canada, half of the owners of most expensive luxury houses in Vancouver are anonymous. The government is worried that these counterfeit owners can be used to evade foreign buyer's tax and land transfer tax.

Interestingly, part of this series of policies is as an upgrade of the policies released in 2016. Is this meaning the policies implemented in 2016 not working well? An empirical study will be analysis whether the 15% tax on foreign buyers in 2016 restrain Metro Vancouver area's house price effectively.

3. Methodology

Before I start to test the policy implemented in 2016, I do a briefly analyze on housing conditions in major Canadian cities to see this policy whether is necessary to implement. According to the data on Canada Mortgage and Housing Corporation (CMHC), the Market Absorption Survey Average Unit Selling Prices of all Newly Completed and Unabsorbed Single-detached and Semi-detached Dwellings in Metropolitan Areas, Large Urban Centres and Census Agglomerations. There can be seen very clearly that Vancouver and Toronto has the highest average selling price compare to other major city in Canada (data shown in table 3 appendix). Take a data example: in September 2014, the average dwellings selling price is \$1,553,543 in Vancouver, \$1,450,003 in Toronto, \$368,918 in Montreal and \$393,877 in Halifax. In September 2015, the average dwellings selling price is \$1,811,505 in Vancouver, \$1,713,641 in Toronto, \$374,949 in Montreal and \$392,354 in Halifax. Toronto and Vancouver not only

has the highest average dwellings selling price, but also the fastest growth rate. The New Housing Price Index (% change on price) for Vancouver is 1% in 2015 and 4.6% in 2016. The number for Toronto is 3.2% in 2015 and 6.3% in 2016; for Montreal is 0.3% in 2015 and 1% in 2016; for Halifax is 0.8% in 2015 and 0.4% in 2016. Data Source is from CMHC (Starts and Completions Survey, Market Absorption Survey, Rental Market Survey, Seniors' Housing Survey, Secondary Rental Market); Statistics Canada (CANSIM). What might cause this differences? I tried to explain the price of the house from the rent I collect data from Census 2016 and compare the data in Canada's big cities. As Table 4 (see appendix) shown, first column is average gross rent paid, second column is average dwelling repair costs, third column vs. fourth column is mode of travel to work (vehicle as drive or not vs. other modes), fifth column is Average number of rooms in the dwelling, sixth column is Average travel distance to work, seventh column is population, eighth column is per capita income, and ninth column is Average weekly wage earnings. In both 2001 and 2006, Toronto, Vancouver has relative high average gross rent paid, especially in Toronto which is higher than \$1000 in 2006.

In Toronto, it has relatively long average travel distance to work, relatively low Average weekly wage earnings, high population, and low Average number of rooms in the dwelling. In Halifax, average gross rent paid is on medium level. Halifax people has relatively short average travel distance to work so percentage of people taking vehicle to work is lower than most other city.

I chose some variables that I consider will effect Average gross rent. They are Average dwelling repair costs, Average number of rooms in the dwelling, Average travel distance to work, per capita income, Average weekly wage earnings, population, and

people taking vehicle to work. I set Average gross rent paid as dependent variable, X_2 is Average dwelling repair costs, X_3 is Average number of rooms in the dwelling, X_4 is Average travel distance to work, X_5 is per capita income, X_6 is Average weekly wage earnings, X_7 is population and X_8 is people taking vehicle to work. Regression result is shown as Table 5 (see appendix).

The following model was used:

$$\ln \widehat{Y}_{it} = 4.43 + 0.829 \ln X_{2it} - 0.01 \ln X_{3it} + 0.206 \ln X_{4it} + 0.218 \ln X_{5it} + 0.005 \ln X_{6it} - 0.927 \ln X_{7it} + 0.91 \ln X_{8it}$$

For 1% increase (decrease) of per capita income, there will be an increase (decrease) Average gross rent by 0.218% holding Average dwelling repair costs, Average number of rooms in the dwelling, Average travel distance to work, Average weekly wage earnings, population and whether people taking vehicle to work constant.

For 1% increase (decrease) of Average weekly wage earnings, there will be an increase (decrease) Average gross rent by 0.005% holding Average dwelling repair costs, Average number of rooms in the dwelling, Average travel distance to work, Average weekly wage earnings, population and whether people taking vehicle to work constant.

The relationship between per capita income and average gross rent is positive and relationship between average weekly wage earnings and average gross rent is positive however, per capita income and average weekly wage earnings in Toronto and Vancouver are both relative medium level compare to other major cities in Canada. In other word, citizen in Toronto and Vancouver has more pressure of housing compare to other Canadians. To sum up, the policy introduce by BC government in Budget 2016 is very

reasonable and necessary. The ratio of house price to per capita income is very unreasonable, so the BC government needs to use policies to restrain house price. I will use differences-in-differences model to estimate effects of the 15% foreign buyer's tax implemented beginning at August 2016 following the equation:

$$P_{cym} = \gamma_c + \gamma_y + \beta policy_{cym} + X_{icym} + \varepsilon_{icym}$$

Dependent variable P is housing price, c is refer to city, y is refer to year and m is refer to month. The "policy" is a dummy variable for the treatment where equal to 0 before August 2016 the policy implemented and equal to 1 after August 2016. β is the estimate of treatment effect. Variables in X_{icym} are the economic indicators variables and varying time at the city level. ε_{icym} is the error term.

4. Data

Summary statistics are shown as Table 1. Data of housing price are collect from Canada Mortgage and Housing Corporation (CMHC) Market Absorption Survey Unit Selling Prices. Data are based on cities' CMA from January 1990 to May 2018 monthly. I collect prices data split into different level: 1st 20% as "twenty", 2nd 40% as "forty", 3rd 60% as "sixty", 4th 80% as eighty, median price as "median", and average price as "average". This splitting price level is in order to find out how policy effect to different level of real estates. And I also collect the traded units and mark the cities the data belong. City 1 is refer to Toronto; City 2 is refer to Vancouver; City 3 is refer to Ottawa; City 4 is refer to Montreal; and city 5 is refer to Calgary. In addition to this, I collect some data of economic indicators: The variable "nstarts" is refer to new housing construction starts including single and semi-detached and condos which are collected

from CMHC. The variable “tbill” is refer to T-bill interest rate, mtbill is the dummy variable to mark the year that T-bill interest rate data are missing. The variable “cpi” is refer to consumers’ price index. I include the CPI data is in order to see if there is a chance that cities with similar CPI level has huge different growth rate in housing price. The variable “population”, “unemployment” “immigrant” are respectively refer to number of population, rate of unemployment and number of immigrant corresponds to the region. Economic indicators data above are collect from Statistics Canada.

Figure 1 shows the average housing price trend in Toronto, Vancouver, Ottawa, Montreal, and Calgary from January 1990 to May 2018. Apparently Vancouver (red line) and Toronto (blue line) has the most growth rate compare to other cities. Especially in Vancouver, housing prices increase rapidly since 2010.

Figure 1



Table 1. Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
time	0				
twenty	1,705	290696.8	169781.2	90000	1372000
forty	1,705	346572.4	221155.1	105000	2000000
sixty	1,705	415697.9	300218.4	120000	2555000
eighty	1,705	541869.8	450257.9	145000	3684000
median	1,705	377357.8	253842.8	115000	2350000
average	1,705	445990.8	336855.6	126117	2746167
units	1,705	580.454	448.7675	34	3544
date	1,705	200399.8	790.3724	199001	201805
city	1,705	3	1.414628	1	5
nstarts	1,705	1364.704	1025.098	39	6070
tbill	1,705	3.348538	2.700892	.17	13.67
mtbill	1,705	.0381232	.1915498	0	1
cpi	1,705	125.0788	20.0721	89.7	174.7
population	1,705	7906540	3903175	2520056	1.44e+07
unemployment	1,705	7.552258	2.036719	2.9	14.9
policy	1,705	.0645161	.2457422	0	1
year	1,705	2003.713	8.207948	1990	2018
iirmigrant	1,705	17033.34	10917.37	2564	44496

5. Results

As the regression estimates result shown in table 2 (table 2 is part of the result and table 3 is the full result), the coefficient of dummy variable “policy”, which is treatment effect on average housing price is 101633 indicate that the policy increased the average price of houses by CAD 101,633. T value is 2.52 where is significant at 95% confident level. In order to see whether this policy effect on a particular price range, I also test the 1st 20%, 2nd 40%, 3rd 60%, 4th 80%, and median price. Treatment effect on bottom 20% price house is 13671 indicate that the policy increased the price on this type of houses by

CAD 13,671. Treatment effect on 2nd 40% price house is 30145 indicate that the policy increased the price on this type of houses by CAD 30,145. Treatment effect on 3rd 60% price house is 46806 indicate that the policy increased the price on this type of houses by CAD 46,806. For the most expensive houses, Treatment effect on 4th 80% price house is 130215 indicate that the policy increased the price on this type of houses by CAD 130,215.

A positive coefficient for some of the regressions indicates that there we unintended consequences of the policy. That is, somehow this policy implemented in 2016 is an unsuccessful policy or say it didn't work out as expected.

The policy has not worked at all for houses in the first, second and third quintile of the housing-price distribution, this can possibly cause by several factors: In short supply. The greater Vancouver area is geographically restricted, surrounded by oceans and mountains, with limited land supply, while developers can build high-density apartments, but the land area will not increase. More and more people live in Vancouver area (for example, more and more immigrants, millennials), the city's limited land supply and increased housing density are a major trend.

Policy is not strong enough to discourage speculators from buying. And speculators can transfer those costs to the final buyer. Policy is not sufficiently diversified that speculators can buy real estate in a different identity. For example, overseas investors can avoid the tax by using a permanent resident status. It is possible that the BC provincial government implement 2018 new policy, which is designed from multiple perspectives, precisely because of the inadequacy of the 2016 policy.

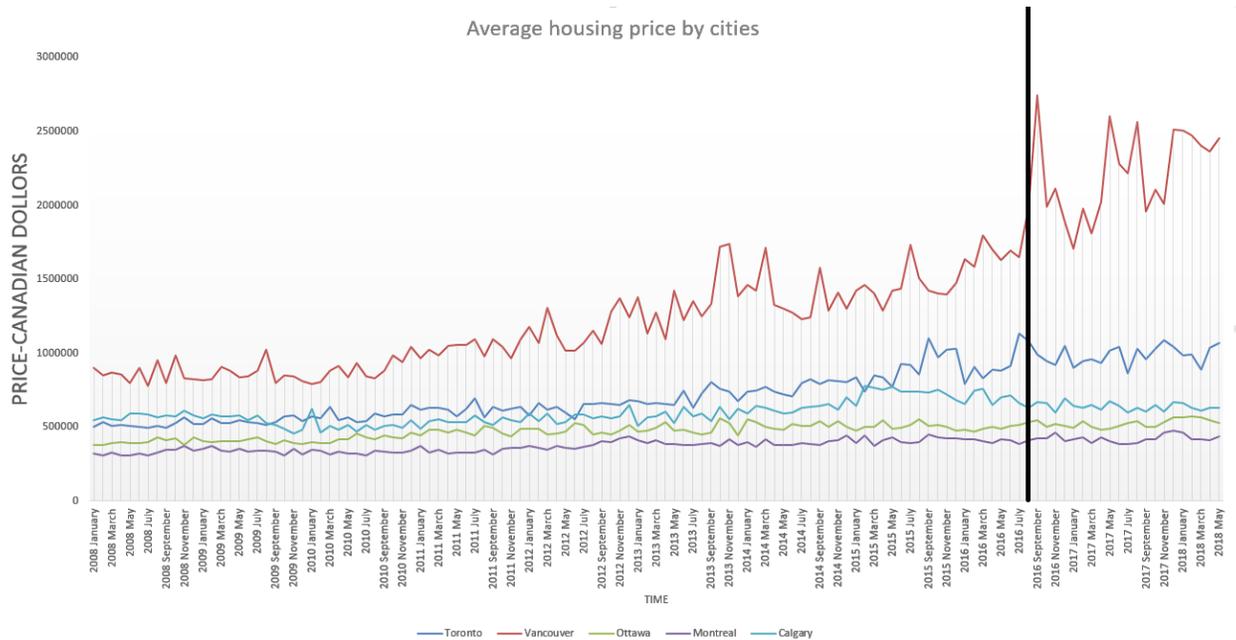
Table 2 Regression estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	average	twenty	forty	sixty	eighty	median
policy	1085006.0* ** (38.72)	444575.9* ** (38.70)	683164.3* ** (42.65)	1020841.3* ** (41.58)	1516583.1* ** (34.89)	804147.3** * (40.52)
nstarts	4.661 (0.96)	-2.807 (-1.42)	-1.202 (-0.44)	3.165 (0.75)	8.924 (1.19)	0.942 (0.28)
tbill	-23644.1***	-9595.4***	- 12944.6** *	-18916.2***	-31846.4***	-15350.1***
mtbill	(-7.44) 110498.8** *	(-7.37) 42415.0** *	(-7.13) 66469.6** *	(-6.80) 105272.5** *	(-6.46) 186184.4** *	(-6.82) 91650.5***
cpi	(3.65) -4013.8*** (-4.80)	(3.42) -286.1 (-0.83)	(3.84) -1493.4** (-3.12)	(3.97) -4006.7*** (-5.47)	(3.97) -6625.1*** (-5.11)	(4.28) -2539.1*** (-4.29)
population	-0.0814*** (-9.35)	-0.0277*** (-7.77)	-0.0422*** (-8.47)	-0.0665*** (-8.72)	-0.111*** (-8.23)	-0.0526*** (-8.52)
unemployment	1904.5 (0.67)	622.9 (0.53)	1328.5 (0.81)	1577.4 (0.63)	140.0 (0.03)	1516.6 (0.75)
immigrant	-1.883* (-2.35)	-0.358 (-1.09)	-0.696 (-1.52)	-1.222 (-1.74)	-2.623* (-2.11)	-0.825 (-1.45)
_cons	1861888.2* ** (14.90)	646691.4* ** (12.62)	995934.9* ** (13.94)	1613885.9* ** (14.74)	2611594.8* ** (13.47)	1252836.3* ** (14.16)
N	1705	1705	1705	1705	1705	1705
t statistics in parentheses						
"** p<0.05	** p<0.01	*** p<0.001"				

Take a closer look in the last decade, as figure 2 shown, the average housing price reach 1 million CAN in 2011 and never fall below that. The black line in figure 2 is represent August 2016, the date when BC Government put the 15% foreign buyers' tax into effect. After this policy implement, the average housing price in CMA Vancouver still increase until October 2016 reach its peak, average housing price fall down but only last 6 months. The housing price rebound to the level before the policy implement.

Compare to other cities, the price changes in Vancouver between May 2016 and May 2017 is just like a bigger normal fluctuation that other city does.

Figure 2



6. Conclusion

From studies above, the policy introduced in Budget 2016 by Government of British Columbia which 15% foreign buyer tax on buyer who is not Canadian to purchase real estate within Metro Vancouver seems not significantly doing its job. The originally purpose, restrain the housing price did not reach. It seems BC government is also aware of the fact and problem of the policy, in 2018 Budget, they make a series of reform at the policy they made in 2016 and proposed a series of new policies including affordable housing plans which are the most stringent Canadian policies ever to crack down on real estate speculation behavior. So far we don't have enough data to analyze the effectiveness of these new policies.

There is another policy implement by Office of the Superintendent of Financial Institutions (OSFI) called OSFI Stress Test (Osfi-bsif.gc.ca, 2018). From January 1, 2018, the bank or lending institution will increase the 2% on top of the basis of the bank's contract mortgage rate, or lending at five-year benchmark interest rate of the Bank of Canada (currently 4.89%). This test is mainly aim at the uninsured borrowers to ensure that they have the ability to repay. At present, the average mortgage rate in Canada is about 2.96%, which means that borrowers must be able to prove that they can afford a 4.96% interest rate to get a loan.

Let me take an example. If a family earns 100,000 dollars a year, in the pre-policy circumstances, if the down payment is 20%, the mortgage with a fixed interest rate of 2.82% for 5 years, and the loan for 25 years are repaid, the family can afford real estate with a price about \$730,000,000. After the implement OSFI Stress Test effect on January 1, 2018, assumed the family still getting a 2.82% interest rate from the bank, but the OSFI Stress Test should be based on the Bank of Canada's benchmark interest rate of 4.89%. With 20% down payment and 25 years of pay-off, the purchasing power of this family dropped down to only about 570,000 Canadian dollars.

The purpose of this policy is to weaken the purchasing power of buyers, restrain market demand and trading activities, and lead to further declines in real estate prices. Home buyers who upgrade their housing will also be affected.

In consideration of the 2016 policy has not been very successful, the policymakers in BC government are beginning to do more than just raise taxes on overseas buyers, but also used more measures to restrain housing prices.

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Appendix

Table 3. Regression estimates full table

	(1)	(2)	(3)	(4)	(5)	(6)
	average	twenty	forty	sixty	eighty	median
policy	1085006.0* **	444575.9* **	683164.3* **	1020841.3* **	1516583.1* **	804147.3** *
	(38.72)	(38.70)	(42.65)	(41.58)	(34.89)	(40.52)
1.city	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)
2.city	-	-	-	-	-	-
	451255.8** *	119834.0* **	211744.0* **	361383.7** *	628045.6** *	273355.7** *
	(-5.96)	(-3.86)	(-4.90)	(-5.45)	(-5.35)	(-5.10)
3.city	-	-	-	-	-	-88655.0***
	134675.6** *	60155.2** *	79339.3** *	101677.3** *	158609.5** *	
	(-9.81)	(-10.68)	(-10.11)	(-8.45)	(-7.44)	(-9.12)
4.city	-	-	-	-	-	-
	663067.9** *	284068.9* **	388090.2* **	549502.6** *	852693.4** *	455486.1** *
	(-13.76)	(-14.38)	(-14.09)	(-13.01)	(-11.40)	(-13.34)
5.city	-	-	-	-	-	-
	840611.6** *	316922.5* **	453941.1* **	680324.9** *	1121126.3* **	548471.0** *
	(-9.78)	(-8.99)	(-9.24)	(-9.03)	(-8.41)	(-9.01)
1990.year	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)
1991.year	-62241.2**	-	-41516.9**	-49250.0*	-72290.2*	-45025.8**
		34323.4** *				
	(-2.68)	(-3.60)	(-3.12)	(-2.42)	(-2.00)	(-2.73)
1992.year	-87566.8**	-	-	-69447.5**	-110585.2**	-60679.4**
		43320.8** *	54715.6** *			
	(-3.29)	(-3.98)	(-3.60)	(-2.98)	(-2.68)	(-3.22)
1993.year	-96872.2***	-	-	-76180.2**	-110947.0*	-68089.0**
		49967.4** *	63390.2** *			
	(-3.31)	(-4.17)	(-3.79)	(-2.97)	(-2.44)	(-3.29)
1994.year	-72383.1**	-	-48895.2**	-56221.9*	-79787.1	-50887.4**
		40354.9** *				
	(-2.62)	(-3.56)	(-3.09)	(-2.32)	(-1.86)	(-2.60)
1995.year	-16409.7	-20508.3	-20718.7	-9411.7	-9033.1	-15444.7
	(-0.64)	(-1.94)	(-1.41)	(-0.42)	(-0.23)	(-0.85)
1996.year	-63207.2*	-	-52074.7**	-50037.2	-67640.3	-50744.9*
		46907.8** *				

1997.year	(-2.11) -70080.3*	(-3.82) - 48859.4** *	(-3.04) -53216.3**	(-1.90) -52686.6	(-1.45) -78267.3	(-2.39) -51897.9*
1998.year	(-2.19) -40074.6	(-3.72) -32620.6**	(-2.91) -30364.8	(-1.88) -25115.2	(-1.58) -51250.9	(-2.29) -27470.7
1999.year	(-1.33) -26204.8	(-2.64) -24425.5	(-1.76) -19407.9	(-0.95) -7023.5	(-1.10) -33262.2	(-1.29) -13767.6
2000.year	(-0.85) 30888.4	(-1.94) -7243.5	(-1.10) 11886.7	(-0.26) 43658.2	(-0.70) 47970.0	(-0.63) 25528.1
2001.year	(1.01) 28761.1	(-0.58) -5006.3	(0.68) 10433.2	(1.62) 43026.0	(1.01) 39729.6	(1.18) 25244.7
2002.year	(0.84) 31094.2	(-0.35) 488.5	(0.53) 18112.4	(1.43) 52354.5	(0.74) 41001.2	(1.04) 34858.5
2003.year	(0.82) 83527.4*	(0.03) 26219.6	(0.84) 52904.0*	(1.58) 99226.4**	(0.70) 112113.0	(1.30) 73632.8**
2004.year	(2.15) 115730.6**	(1.65) 45044.3**	(2.38) 76148.3**	(2.91) 132331.9** *	(1.86) 153558.9*	(2.67) 100160.3** *
2005.year	(2.81) 186456.1** *	(2.67) 77986.3** *	(3.23) 119256.0* **	(3.67) 196341.5** *	(2.40) 241985.9** *	(3.43) 152852.6** *
2006.year	(4.48) 280397.9** *	(4.58) 116718.2* **	(5.02) 174116.4* **	(5.39) 276704.4** *	(3.75) 360599.9** *	(5.19) 220113.7** *
2007.year	(6.76) 360731.8** *	(6.86) 159664.6* **	(7.34) 226427.8* **	(7.61) 346874.8** *	(5.60) 465716.2** *	(7.49) 276945.6** *
2008.year	(8.31) 386913.5** *	(8.97) 174382.6* **	(9.12) 245320.9* **	(9.12) 373710.2** *	(6.91) 496294.6** *	(9.01) 303738.5** *
2009.year	(8.14) 345706.6** *	(8.95) 155986.5* **	(9.03) 217489.8* **	(8.97) 336932.3** *	(6.73) 453655.7** *	(9.02) 270549.0** *
2010.year	(7.00) 381282.3** *	(7.70) 168320.5* **	(7.70) 237221.5* **	(7.79) 369827.2** *	(5.92) 483275.8** *	(7.73) 294565.0** *
2011.year	(7.59) 461149.4** *	(8.17) 192899.6* **	(8.26) 284565.7* **	(8.40) 433569.1** *	(6.20) 592287.0** *	(8.28) 348360.7** *
2012.year	(8.77) 522918.1** *	(8.95) 216743.5* **	(9.47) 319985.2* **	(9.42) 499053.2** *	(7.26) 717411.7** *	(9.36) 396718.6** *
2013.year	(9.71) 596689.5** *	(9.82) 230532.8* **	(10.39) 353890.1* **	(10.58) 565238.2** *	(8.59) 834179.5** *	(10.40) 444617.7** *
2014.year	(10.95) 649529.7** *	(10.32) 257816.5* **	(11.36) 392677.1* **	(11.84) 619255.4** *	(9.87) 901708.3** *	(11.52) 488625.0** *
	(11.50)	(11.13)	(12.16)	(12.51)	(10.29)	(12.21)

2015.year	717299.2** *	291877.3* **	438991.8* **	682289.5** *	1019670.8* **	542927.3** *
	(12.36)	(12.27)	(13.23)	(13.42)	(11.32)	(13.21)
2016.year	726000.1** *	288526.5* **	433533.1* **	672339.7** *	1022285.8* **	533645.7** *
	(12.21)	(11.83)	(12.75)	(12.91)	(11.08)	(12.67)
2017.year	604742.0** *	256072.4* **	377505.1* **	583582.6** *	839139.2** *	462560.3** *
	(9.37)	(9.68)	(10.24)	(10.33)	(8.38)	(10.12)
2018.year	665261.6** *	280606.7* **	405044.7* **	638686.3** *	859725.5** *	506870.3** *
	(9.31)	(9.58)	(9.92)	(10.20)	(7.75)	(10.02)
nstarts	4.661 (0.96)	-2.807 (-1.42)	-1.202 (-0.44)	3.165 (0.75)	8.924 (1.19)	0.942 (0.28)
tbill	-23644.1***	-9595.4***	- 12944.6** *	-18916.2***	-31846.4***	-15350.1***
	(-7.44)	(-7.37)	(-7.13)	(-6.80)	(-6.46)	(-6.82)
mtbill	110498.8** *	42415.0** *	66469.6** *	105272.5** *	186184.4** *	91650.5***
	(3.65)	(3.42)	(3.84)	(3.97)	(3.97)	(4.28)
cpi	-4013.8*** (-4.80)	-286.1 (-0.83)	-1493.4** (-3.12)	-4006.7*** (-5.47)	-6625.1*** (-5.11)	-2539.1*** (-4.29)
population	-0.0814*** (-9.35)	-0.0277*** (-7.77)	-0.0422*** (-8.47)	-0.0665*** (-8.72)	-0.111*** (-8.23)	-0.0526*** (-8.52)
unemployment	1904.5 (0.67)	622.9 (0.53)	1328.5 (0.81)	1577.4 (0.63)	140.0 (0.03)	1516.6 (0.75)
immigrant	-1.883* (-2.35)	-0.358 (-1.09)	-0.696 (-1.52)	-1.222 (-1.74)	-2.623* (-2.11)	-0.825 (-1.45)
_cons	1861888.2* **	646691.4* **	995934.9* **	1613885.9* **	2611594.8* **	1252836.3* **
	(14.90)	(12.62)	(13.94)	(14.74)	(13.47)	(14.16)
N	1705	1705	1705	1705	1705	1705
t statistics in parentheses ="* p<0.05	** p<0.01	*** p<0.001"				

Table.4

Source	SS	df	MS	Number of obs	=44
Model	.862462464	7	.123211781	F<7, 36)	=12.04
Residual	.368375237	36	.010232645	Proto > F	=0.0000
				R-squared Adj	=0.6425
				R-squared	=0.7007
Total	1.2308377	43	.028624598	Root MSE	=.10116

lny	Coef.	Std. Err.	t	p> t	(95% Conf..	Interval]
lnx2	.828831	.5105894	1.62	0.113	-.2066922	1.864354
lnx3	-.1023512	.3217801	-0.32	0.732	-.7551315	.550049
lnx4	.20593	.0950979	2.17	0.037	.0130623	.3987974
lnx5	.2176203	.1315952	1.65	0.107	-.0492672	.4845078
lnx6	.0053587	.1100928	0.05	0.961	-.2179198	.2286372
lnx7	-.9272382	.197309	-4.70	0.000	-1.327419	-.5270971
lnx8	.9056738	.192022	4.72	0.000	.5162351	1.295112
_cons	4.402943	.9275237	4.75	0.000	2.321838	6.284048