Do taxes on foreign purchasers lower housing prices?

Evidence from the Additional Property Transfer Tax in B.C.

by

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Abstract

Housing affordability is an increasingly important public policy challenge not only in Canada, but also worldwide. The B.C. provincial government introduced the Additional Property Transfer Tax in Metro Vancouver as a surprise legislation on August 2nd, 2016. It imposed an additional 15% transfer tax on individuals or firms purchasing homes in Metro Vancouver who are not citizens or permanent residents of Canada. In February 2018, the government extended the tax to several other regions in British Columbia, including Greater Victoria. I exploit the heterogeneous regional implementation of the APTT to test its effectiveness in slowing the excessive growth in house prices in affected regions and increasing housing affordability for local residents. I find that the APTT reduces relative house price growth by approximately 1%. I also find that this effect is mostly front-loaded, with the decrease in relative growth occurring immediately after the announcement of the tax and fading over a period of 7 months.

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1 Introduction

Housing affordability is an important issue in larger Canadian cities such as Vancouver, Toronto, Victoria and increasingly, Montreal. The median residential property in Vancouver is 42 times greater than the median income of an earner in the first income quantile. It is 14.9 times greater than the median income of a second quantile earner. In a more affordable city, like Halifax, these ratios are 5.9 and 3.4 respectively (Statistics Canada, Table 46-10-0050-01). The B.C. provincial government introduced legislation in 2016 and 2018 in an attempt to make housing more affordable for British Columbians. One of the most significant among the policy measures is the Additional Property Transfer Tax for Foreign Entities (APTT), commonly known as the foreign buyers tax.

B.C. and Ontario provincial governments identify foreign investors as an important driver of increasing real estate prices (The Canadian Press, 2017) . In June 2016, over one billion dollars in real-estate transactions in Vancouver involved foreign entities, making up 10.56% of the value of all real estate transactions (BC Stats - Property Transfer Tax Data, 2016). In February 2018 7.6% of all residential properties in Vancouver were owned by individuals whose primary residence is outside Canada.

In this paper, I seek to estimate the impact of the APTT on housing prices in British Columbia. I exploit the heterogeneous regional implementation of the APTT to test its effectiveness in slowing the excessive growth in house prices in affected regions and increasing housing affordability for local residents. I estimate a standard difference-in-difference model, taking advantage of the fact that the APTT was first introduced in some regions in Greater Vancouver then extended to include other metropolitan areas in British Columbia. Exploiting the same heterogeneity, I also conduct an event study analysis. Under this framework, I am able to draw more detailed conclusions about the effect of the APTT on house prices over time.

I find that the APTT reduces relative house price growth by approximately 1%. I also find that this effect is mostly front-loaded, with the decrease in relative growth occurring immediately after the announcement of the tax and fading over a period of 7 months. Based on these results, I find the APTT had a minor impact on housing affordability issues in urban B.C.

Foreign buyers can both increase the demand for housing and restrict the supply of rental housing [1]. When foreigners are unable to safely store capital in their home countries due to economic or political risks, they often turn to exterior housing markets as an alternative (Transparency International, 2015). This is facilitated by the fact that foreign buyers have access to mortgages in Canada, allowing them to purchase

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[1]Foreign-owned houses often remain empty. They are not always rented out, effectively decreasing the supply of rental housing.

homes with a standard down payment and financing the rest of the cost (Gold, 2015).

The APTT considerably increases the amount of money a foreign buyer must pay at the time of purchase of a house. By significantly increasing the up-front cost of homes, legislators hope to reduce the viability of homes as an investment for foreign purchasers. In the presence of a tax, buyers will likely choose to store wealth elsewhere, where the tax is not imposed. Easing upward pressure on demand and increasing rental housing supply should, all else equal, lower the price of homes in the region. My results show that the APTT did not yield the desired long run effect of stifling excessive house price growth and lowering prices in urban BC in a meaningful way.

Foreign buyers are far from the only source of rapidly increasing housing costs. Low mortgage rates are an important factor (Otto, 2007), as is the inability, through restrictions or otherwise, of housing supply to keep up with demand. In 2017, Canada published the National Housing Strategy, promising a $5B annual investment in housing, including the construction of up to 125 000 new homes over the span of the program (Canada Mortgage and Housing Corporation, 2018) . In British Columbia, alongside the APTT, the provincial government introduced policy targeting housing speculation and owners leaving houses unrented. In April 2017, Ontario introduced a comprehensive set of housing policies including rent controls, increased construction, and anti-speculation and foreign ownership policies. Given the apparent desire and political motivation to address housing affordability issues, examining the impact of policy on house prices is important. In this paper, I provide early estimates of the impact one of the many measures implemented to tackle the rising costs of housing in B.C.

The B.C. provincial government introduced the APTT in Metro Vancouver as a surprise legislation on August 2nd, 2016. It imposed an additional 15% transfer tax on individuals or firms purchasing homes in Metro Vancouver who are not citizens or permanent residents of Canada. In February 2018, the government extended the tax to several other regions in British Columbia, including Greater Victoria. The tax rate increased to 20% in all affected regions as part of the expansion (Government of B.C., 2016).

My paper is structured as follows. Section 2 provides some motivation for the implementation of a tax on foreign buyers of residential real estate. It also summarizes the effects of transfer taxes more broadly. Section 3 describes the data and provides some summary statistics and qualitative analysis of the impacts of the APTT. Section 4 outlines the identification strategy I use to find my results, and I present my results in section 5. In section 6, I discuss the implications of my results, and in section 7 I conclude.

2 Background

Housing affordability is an increasingly important public policy challenge not only in Canada, but also worldwide. Several cities in Australia, New Zealand, and the state of Hong Kong have all implemented similar policies to the APTT in British Columbia. Each of these entities identify foreign buyers as an important driver of real estate prices. They tax residential real estate purchases by foreign buyers between 4 and 15 percent in an effort to discourage foreign investment in heating real estate markets. Singapore imposed an additional 10% tax on foreign buyers in 2011, and Hong Kong introduced an additional 15% tax on foreign buyers in 2012 (Chao and Yu, 2015).

Badarinza and Ramadorai (2018) assess the impact of foreign demand on house prices in London. They use variation in capital risk introduced by economic or political instability in foreign countries as a proxy for foreign demand in their analysis. They also use racial composition of neighborhoods as a measure of foreign neighborhood preference. They find that there is a strong effect of foreign risk on London house prices, and that these effects are long-lasting. A increase in risk in a foreign country is associated with a 1.41% price spread between high and low foreign-origin neighborhoods. Badarinza and Ramadorai attribute this effect to a combination of safe haven[2] and immigration effects.

There is therefore some empirical evidence that foreign buyers can have a meaningful effect on house prices. In several countries, including Canada, governments have moved to disincentivize foreign ownership of real estate or ban it outright. By assessing the effectiveness of one such policy, this paper provides another estimate of the impact of foreign buyers on house prices.

In equilibrium, the real cost of owning a house should equal the real cost of renting a house. If one exceeds the other, houses are conventionally considered to be over- or under-priced. The real cost of owning a house, or "imputed rent" depends on foregone interest, property taxes, deductibility of mortgage interest, maintenance costs, expected capital gain, and a risk premium (Hendershott and Slemrod, 1983). When the capital gains are expected to increase substantially, the real expected cost of housing decreases, and demand for houses increases. The increased demand then increases house prices.

The impact of selective property taxes on house markets has not been studied in-depth. The use of targeted property taxes as a response to increasing housing costs is relatively recent. Chao and Yu (2015), develop a model of house prices in a small open economy with domestic consumers and foreign buyers of housing. They use their benchmark model to assess the performance of "second-best" policy measures implemented by Hong-Kong as a response to increasing foreign demand for housing. These include a 10%

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[2]Safely storing capital.

down payment premium for foreign buyers and a subsidy for low- and middle-income residents. They find both of these policy measures underperform relative to a tax on foreign purchases of housing. Furthermore, they suggest using the tax revenue to subsidize local buyers of housing.

This is consistent with a proposal suggested by British Columbian economists, notably Tsur Somerville, Tom Davidoff, and Joshua Gottlieb, from the University of British Columbia. This proposal, called the "BC Housing Affordability Fund", entails a 1.5% property tax surcharge on foreign buyers of residential real estate. The tax revenue would then be transferred as a lump-sum payment to all Canadian tax filers in the included areas.

Real estate transfer taxes, or land transfer taxes, already exist in a variety of contexts. These taxes are generally modest and levied on all transactions with the intention of raising revenues at the municipal or regional level. Transaction taxes in the context of housing reduce residential mobility. Residents will stay in houses that no longer match their needs owing to the increased cost of moving.

Dachis et al. (2012) estimate that a 1.1% transfer tax implemented in Toronto in 2008 caused a 15% decline in the volume of single-family home sales and a decrease in house prices roughly equivalent to the tax. These changes are associated with a welfare loss of roughly 1\$ per 8\$ of tax revenue generated when compared to an equivalent property tax. Kopczuk and Munroe (2015) exploit a discontinuity in property transfer tax rates in New York and New Jersey to evaluate their effects on the functioning of the real estate market. The policy, which imposed a 1% transfer tax on transactions of \$1MM and over only, was found to cause a significant bunching effect below the tax threshold and reduce the number of housing transactions by 0.7%. They conclude it is unlikely that these results are driven by tax evasion through some arrangement between buyer and seller.

Property transfer taxes, when used as revenue raising tools, have negative side-effects. Some of the undesirable properties of property transfer taxes are beneficial in other contexts. Modest property transfer taxes have been shown to markedly reduce the number of transactions in the real estate market. This form of tax may then be of interest to legislators who want to disincentivize foreign investors from participating in their local real estate markets. This paper is the first to present estimates of the impact of selective property transfer taxes on discouraging local investment in residential real estate.

3 Data and Summary Statistics

3.1 Data

I obtain the data I use to estimate the causal impact of the APTT on housing affordability in BC from the Vancouver, Fraser Valley, Victoria, and Vancouver Island real estate boards. Data from the District of Central Okanagan are unavailable before 2017, so I do not include them in my analysis. The data consist of Home Price Index (HPI) representative house prices by month and municipality within the Real Estate Board's jurisdiction. Real estate boards prefer HPI over measures like mean and median house prices. They argue HPI is less susceptible to random changes in buying patterns and preferences than mean or median house prices, making it easier to track house prices over time. The HPI is constructed by pricing house characteristics based on transactions in a given month, then combining a fixed basket of characteristics into a time-invariant "representative house". This basket of characteristics varies across regions depending on amenities, housing stock, preference, and other factors. In practice, a representative house may have 3 bedrooms and 2 bathrooms in North Vancouver and 2 bedrooms and 1 bathroom in Abbotsford, for example. Prices are therefore not wholly comparable between regions, but since the definition of a representative house does not change within regions over time, differences in price growth across regions are still observable. In July 2017, the composition of the representative house for several regions changed. I account for this in my analysis by including an individual dummy variable for each of these regions at the time of the change. I flag the regions affected by this change with a star in tables 1 and 2 in section 3.2.

I use detached homes for my analysis instead of townhouses, condos, or an aggregate. Detached homes are available for all municipalities and months, whereas smaller municipalities will sometimes have too few sales in other categories to report a price every month. Using this measure introduces some limitations to my analysis. First, single family homes may be over or under-represented in foreign real estate transactions. If foreign investors are drawn to higher prices on average, my analysis may overestimate the impact of the APTT on overall house prices in British Columbia. On the other hand, if foreign buyers prefer to purchase presale condos, for example, my analysis may underestimate the effects of the APTT on the broader market. Second, single-family house prices may not reflect broader affordability. I do not demonstrate how the single-family house market is connected to other housing markets. It could also be the case that consumers are shifting towards other forms of housing over time, driving down demand for single family houses and lowering prices in that segment as a result. I also make no mention of the cost of rental housing.

I collect data on the basis of availability. Most Canadian real estate boards transitioned from reporting

mean and median house prices in 2014 to reporting HPI prices. Some retroactively report HPI prices from the beginning of their publicly available data, while others do not. For consistency reasons, I limit my sample to prices reported using the HPI measure. My sample is an unbalanced panel of HPI prices, reported monthly from January 2005 to December 2019. Data from the Vancouver real estate board are available from January 2005. Data from the Fraser Valley real estate board are available from January 2010. Data from the Victoria and Vancouver Island real estate boards are available from January 2014. No data from the Okanagan real estate board are used as they are only available from January 2017 onward, after the policies I am interested in are implemented. Data are collected for various time spans from a total of 52 municipalities and regions.

3.2   Summary Statistics

From 2016 to 2018, the BC government implemented several housing affordability measures in quick succession. Thankfully, there is spatial and temporal variation in the implementation of these policy instruments. The first wave of the APTT was implemented in the Greater Vancouver area only, in August of 2016. The second wave extended the tax to the Fraser Valley, Capital Region, Nanaimo and Central Okanagan regional districts in February of 2018. Still, eight municipalities in my sample remain exempt from this tax.

The Speculation and Vacancy Tax was announced at the same time as the second wave of the APTT, although took effect later in January 2019, and applies to mostly the same regions. The effects of these simultaneous announcements are confounded in my analysis, so I present results for the first implementation of the APTT only, then results for both waves of the APTT and the SVT combined. The Empty Homes Tax, implemented in January of 2017, applies only to the city of Vancouver.

Tables 1 and 2 below display which of the policy interventions apply to which regions. Note that all regions that experienced the APTT in the first wave were subject to the 5% increase of the APTT to 20% in the second wave of implementation.

Table 1: Policy Interventions

	APTT	APTT Expansion	SVT	EHT
Announcement Dates	July 2016	February 2018	February 2018	November 2016
Implementation Dates	August 2016	February 2018	January 2019	January 2017
Greater Vancouver				
Bowen Island	x	x		
Burnaby East	x	x	x	
Burnaby North	x	x	x	
Burnaby South	x	x	x	
Coquitlam	x	x	x	
Ladner	x	x	x	
Maple Ridge	x	x	x	
New Westminster	x	x	x	
North Vancouver	x	x	x	
Pitt Meadows	x	x	x	
Port Coquitlam	x	x	x	
Port Moody	x	x	x	
Richmond	x	x	x	
Squamish				
Sunshine Coast				
Tsawwassen				
Vancouver East	x	x	x	x
Vancouver West	x	x	x	x
West Vancouver	x	x	x	
Whistler				
Fraser Valley				
Abbotsford		x	x	
Mission		x	x	
White Rock/South Surrey	x	x	x	
Langley	x	x	x	
Delta - North	x	x	x	
Surrey - Central	x	x	x	
Surrey - Cloverdale	x	x	x	
Surrey - North	x	x	x	

Table contains all regions within Greater Vancouver and Fraser Valley real estate boards.

'x' represents policy applies to specified region. APTT = Additional Property Transfer Tax

SVT = Speculation and Vacancy Tax, EHT = Empty Homes Tax

Table 2: Policy Interventions (Continued)

	APTT	APTT Expansion	SVT	EHT
Announcement Dates	July 2016	February 2018	February 2018	November 2016
Implementation Dates	August 2016	February 2018	January 2019	January 2017
Greater Victoria				
Victoria		x	x	
Victoria West*		x	x	
Oak Bay		x	x	
Esquimalt*		x	x	
View Royal		x	x	
Saanich East		x	x	
Saanich West		x	x	
Sooke*		x	x	
Langford*		x	x	
Metchosin*		x	x	
Colwood*		x	x	
Highlands*		x	x	
North Saanich*		x	x	
Sidney*		x	x	
Central Saanich*		x	x	
ML Malahat and Area		x		
GI Gulf Islands		x		
Vancouver Island				
Campbell River				
Comox Valley				
Duncan*				
Nanaimo*		x	x	
Parksville/Qualicum		x		
Port Alberni				
Islands		x		

Table contains all regions within Greater Victoria and Vancouver Island real estate boards.

'x' represents policy applies to specified region. APTT = Additional Property Transfer Tax

SVT = Speculation and Vacancy Tax, EHT = Empty Homes Tax

Table 3 below presents average annual representative house prices, grouped by real estate board (REB). It can be seen when the data become available for each REB. Observations vary by REB grouping because the amount of geographical subdivisions vary for each of them. For example, the Greater Vancouver real estate Board contains 20 subdivisions, whereas the Fraser Valley real estate Board only contains 8. Bolded values indicate that the definition of a representative house changed for some regions within the grouping in that year. These regions include Victoria West, Esquimalt, Sooke, Langford, Metchosin, Colwood, Highlands, Saanich West, North Saanich, Central Saanich, and Sydney. A scan of the mean house prices in table 3 suggests a widespread housing affordability issue in BC. From 2005 to 2019, mean house prices in the Greater Vancouver area increased almost 250%. This includes the downturn caused by the 2008 global recession. From 2010 to 2019, mean house prices in the Fraser Valley region increased by 185%. Over a span of only 5 years, mean house prices in the Nanaimo and other Vancouver Island regions excluding Victoria increased 166%.

Table 3: Average Single Family Home Price by District (Thousands)

	Vancouver		Fraser Valley		Victoria		Nanaimo	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
2005	542.31	205.87						
2006	625.14	240.58						
2007	699.15	285.23						
2008	730.20	303.34						
2009	684.37	272.08						
2010	760.54	330.10	515.17	106.96				
2011	820.27	413.01	532.35	130.00				
2012	848.66	434.70	548.54	143.82				
2013	832.75	419.71	548.15	134.34				
2014	883.29	462.41	569.57	147.46	504.96	130.55	286.73	52.32
2015	1020.53	554.46	623.10	173.15	531.36	145.68	296.23	57.16
2016	1330.51	727.28	828.04	244.77	620.95	191.84	329.73	73.12
2017	1423.01	717.55	931.42	242.79	**703.03**	195.22	**394.43**	85.72
2018	1435.61	648.00	993.55	209.64	752.73	189.11	455.08	86.83
2019	1319.89	550.69	949.58	187.19	750.64	165.19	477.70	85.55
Mean	930.42	550.35	703.95	257.58	643.95	197.82	372.48	105.13
Obs.	3600		960		1224		500	

Mean of all annual HPI house prices within real estate board.
Data presented for years available. Std. Dev. = Standard Deviation
Bolded values reflect representative house change within real estate board.

Table 4 below presents average annual representative house price growth rates, grouped by REB. Omitted values indicate that the definition of a representative house changed for some regions within the grouping

in that year. A growth rate is meaningless in those cases. Housing affordability issues in BC are not only characterized by high prices, but also by high price growth. The mean growth rate of housing prices in the Vancouver region from 2005-2019 is just over 6%. This timespan includes the negative growth during financial crisis of 2008 and more recently, 2018 and 2019. Growth in some years was as high as 26%. There is some hope that policies have been effective, especially in Vancouver and the Fraser Valley where price growth has been negative for two years. However, a sustained run of high growth means that it is not enough to only slow growth, high prices must be addressed as well.

Table 4: Annual Single Family Home Price Growth Rate by District

	Vancouver		Fraser Valley		Victoria		Nanaimo	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
2005	9.90	1.29						
2006	12.34	2.51						
2007	11.05	2.64						
2008	-8.26	4.42						
2009	8.88	5.84						
2010	1.11	4.88	0.74	2.82				
2011	8.87	5.64	3.21	3.33				
2012	-1.74	2.86	1.66	2.59				
2013	2.07	2.51	1.95	1.49				
2014	7.43	2.57	4.15	2.04	2.40	3.26	1.43	3.17
2015	20.07	5.87	16.17	3.17	7.00	3.49	5.14	3.64
2016	18.89	4.54	23.94	3.71	19.24	3.99	15.19	3.29
2017	10.10	4.75	13.71	4.85	-	9.81	-	3.08
2018	-5.24	5.42	-1.63	3.13	5.90	4.38	11.26	3.42
2019	-3.31	2.69	-1.08	2.20	0.73	2.12	2.83	3.28
Mean	6.14	9.15	6.28	8.72	7.18	7.85	8.92	7.00

Mean of all annual HPI house price growth rates within real estate board.

Data presented for years available. Std. Dev. = Standard Deviation

Omitted values reflect representative house change within real estate board.

I plot the average house price for regions within the Fraser Valley and Vancouver real estate boards in figure 1. Both series trend relatively linearly until January 2013. Then, house prices appear to grow exponentially. The BC government decided to take action to make housing more affordable in August 2016, represented by the vertical line. At first glance, house prices appear to decline both in regions affected and unaffected by the APTT. However, prices decline more sharply in regions affected by the tax. This difference in declines is an indicator that the APTT may have had an effect, and is worth investigating further.
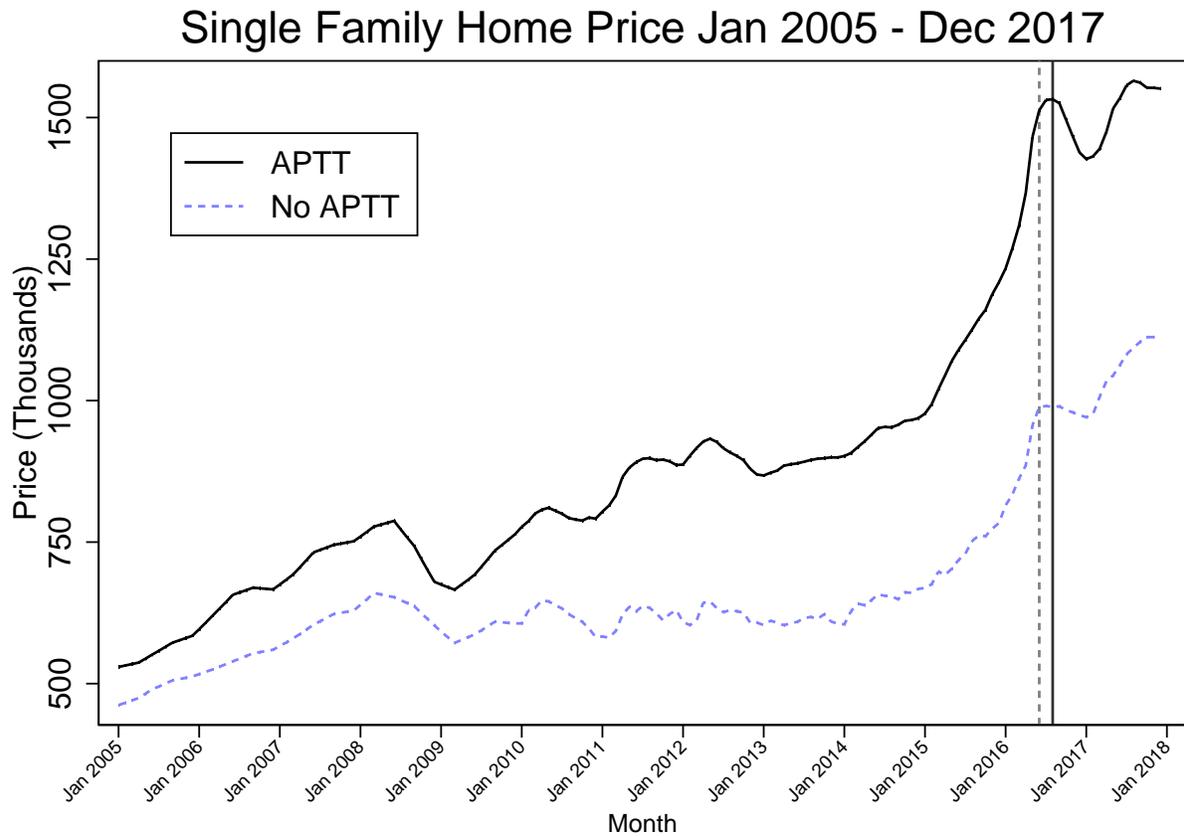
Figure 1: Greater Vancouver real estate Board data only (Available from January 2005 to December 2019). Other regions are omitted because data are not available for the entire time horizon. The series represented by a solid line comprises regions where the APTT is eventually implemented (APTT announcement date represented by dashed vertical line, implementation date represented by solid vertical line). The APTT is not implemented in the dashed line regions over this time horizon.

4 Identification Strategy

To estimate the causal impact of the APTT on housing prices, I use a difference-in-difference model with month and city fixed effects. In this framework, month fixed effects control for time-variant factors affecting house prices in all regions simultaneously, such as shocks in the Canadian economy or the mortgage stress test implemented at the federal level in October 2016. City fixed effects control for factors affecting house prices differently by region that do not vary over time. These could include geographical amenities and population, assuming population growth is comparable across regions. Factors that vary across regions over time can still confound my analysis. For example, abnormal growth in housing stock in one region would bias my estimates.

There are two crucial identifying assumptions in a difference-in-difference analysis such as this one. The first is the parallel trends assumption. In the absence of some change, the variable of interest must be changing at the same rate in the treatment and control groups. In the context of my analysis, house prices must be changing at the same rate in the counterfactual world where the APTT is not implemented in either the control or treatment groups.

A rough sketch of the data, as seen in figure 1 above, supports the parallel trends assumption. Both series trend in a very similar way until the APTT is implemented. When the APTT comes into effect, the regions that are affected appear to experience a larger negative house price shock than the unaffected regions.

The second assumption is that the treatment must be uncorrelated with the outcome of interest, or the absence of selection bias. For this assumption to hold in my analysis, the foreign buyers tax must have been implemented independently of detached house prices in the region. There is some reason to believe the second assumption holds in my analysis, especially for the first wave of the APTT. The BC government implemented the APTT on a trial basis in the Greater Vancouver Regional District first. Other regions, however, faced similar growth rates in housing prices. The remaining urban regions in BC eventually implemented the APTT as well.

My preferred difference-in-difference specification is the following:

$$log(\Delta P_{it}) = \alpha_i + \gamma_t + \beta_j D_{itj} + \epsilon_{it} \tag{1}$$

Where ΔP_{it} is the first difference of HPI representative house price in region i and month t, α_i is a set of region fixed effects, γ_t is a set of month fixed-effects, and D_{itj} is a set of indicator variables for the announcement of the first and second wave of the APTT, the Empty Homes Tax, and the Speculation and Vacancy Tax that equal 1 if the policy is present in region i and time t.

Under this framework, absolute price changes are indistinguishable from relative price changes. If prices in regions affected by the APTT decrease relative to prices in unaffected regions, I cannot conclude if the change resulted from an absolute decrease in foreign demand or a shift in foreign demand to unaffected markets.

As an extension of the primary difference-in-difference specification, I also estimate a model using an event study framework. It allows for treatment effects that vary period over period. This is of interest in my analysis because of the role of expectations in house prices: if there is sentiment that the APTT will drastically lower house prices, homeowners will sell, housing supply will increase, and prices will fall. If they

later observe that the APTT is ineffective, the effect will largely disappear over time.

The model I estimate under this framework is the following:

$$log(\Delta P_{it}) = \alpha_i + \gamma_t + \sum_{y=-9}^{-1} \phi_y D_{it} + \sum_{y=1}^{10} \psi_y D_{it} + \beta_j D_{itj} + \xi_{it} \tag{2}$$

Where y is the elapsed time to the announcement of the APTT. The set of y dummies jointly represent the impacts of the APTT. Embedded in the event study is an informal test of the parallel trends identifying assumption. I include dummies for the APTT before the policy is announced. The coefficient on all of these dummies should be zero if my model is well-specified.

5 Results

I present the results of my difference-in-difference specification (eq. 1) in table 5 below. If foreign buyers were indeed a significant driver of British Columbia residential real estate prices, I would expect to see a fairly significant, permanent decrease in the relative price of homes in regions affected by the APTT. I observe a statistically significant 1.4% decrease in relative house price growth when I limit my sample to December 2017. Limiting my sample to December 2017 means I only observe the change in house prices between regions affected by the first wave of the APTT (mostly in Greater Vancouver) and those that were not. The results of my difference-in-difference specification suggests a permanent decrease in relative price growth. The magnitude of this effect on prices therefore depends on the time horizon in question. However, the results of my event study specification suggest that this effect is only temporary. These results correspond to an approximately $2 thousand decrease in prices for the median house in the sample over the span of the event study.

When I do not limit my sample, I observe a statistically significant 0.9% decrease in relative house price growth. In this specification, I observe the change in house prices between all regions ever affected by the APTT and those that were not.

My results show the increment of the APTT from 15% to 20% actually increases relative price growth by 1.2%. A large portion of the regions that are affected by the APTT receive treatment in the second round, when the tax rate increased to 20%. Therefore, only the regions included in the first wave of the APTT contribute to the estimate of the impact of the increment of the tax. I later argue in my event study framework that the effect of the APTT dissipates over time. The gradual return to a null effect may confound

Table 5: Impact of Policies on Log House Price Growth
All Policies Included by Announcement Date

	Ordinary Least Squares		Two-Way Fixed Effects (1)	
	First Wave Only	Both Waves	First Wave Only	Both Waves
APTT	-0.004	-0.003	-0.014	-0.009
	(0.001)***	(0.001)***	(0.001)***	(0.001)***
Empty Homes Tax	-0.004	-0.005	-0.005	-0.007
	(0.003)	(0.001)***	(0.002)***	(0.001)***
APTT Extension		0.000		0.012
		(0.002)		(0.003)***
Speculation and Vacancy Tax		-0.005		-0.009
		(0.002)*		(0.003)***
Observations	5040	6230	5040	6230

Standard errors in parentheses

OLS specifications are eq.(1) without month and city fixed-effects.

First Wave Only specifications limit sample to December 2017. Both Wave specifications do not limit sample.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

the impact of the increment of the APTT.

I plot results from my event study specification (equation 2) in figure 2. The figure depicts the coefficients on the set of dummies capturing the effect of the APTT. I include a 95% confidence interval around my estimates. Under an event study framework, the effects of the APTT are slightly different from my difference-in-difference specification. I observe a statistically significant decrease in relative house price growth of 1.7% the month the APTT is announced. The effect increases in magnitude until the third month, where I observe a 2.8% decrease in relative house price growth. The effect of the policy then gradually decreases until the seventh month after the policy is implemented, where the effect is not statistically different from 0. I omit the month the APTT is announced in my regression for collinearity reasons. There is a spike in the coefficients in the few months before the policy is announced. If the model is well specified, those coefficients should be equal to zero. I am unable to explain the fact that the coefficients before the APTT is announced are greater than zero. The coefficient estimates from the specification where I do not limit my sample can be seen in figure 4 in the appendix.

Effect of APTT on Log House Price Growth Over Time
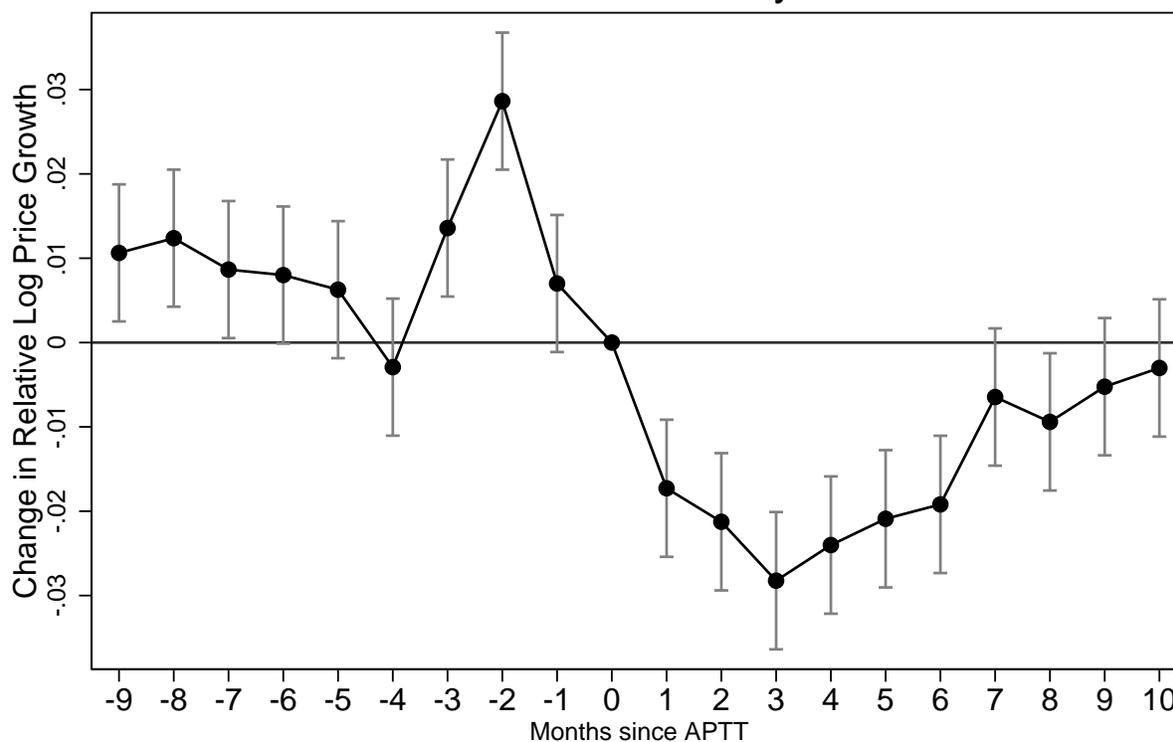## First Wave Only

Figure 2: Event study results. Coefficients on APTT from eq.(2) displayed. Sample is limited to December 2017. Time 0 corresponds to APTT announcement date, July 2016.

6 Discussion and Limitations

My empirical analysis demonstrates how a real estate transaction tax on foreign buyers affects house price growth in urban British Columbia. My difference-in-difference specification suggests a small, permanent decline in house price growth following the announcement of the APTT. Allowing the effects of the tax to vary over time, as in my event study specification, suggests the tax has a larger but temporary effect on house price growth and thus a modest effect on house prices.

There is some uncertainty surrounding the mechanism driving my results. If I observed a small permanent decline in house price growth after the implementation of the APTT, it would be within reason to conclude that foreign demand has a small, real impact on house prices in BC. However, because I only observe a temporary effect on growth rates, it is unclear what is driving my results. It could be that foreign purchasers have found a way to circumvent the tax. There is some evidence of attempted arbitrage in the form of

purchasing services to avoid paying the APTT (Feigenbaum Law, 2019), but the BC government denies the possibility. Would-be purchasers of B.C. residential real estate may also be increasing the rate at which they become permanent residents of Canada to circumvent the tax. It could also be the case that the APTT has little to no effect on foreign demand, or that the impact of foreign demand on prices is negligible, but that there was sentiment that the tax would devalue residential real estate. If that were the case, it is possible that owners would sell their houses, sometimes at lower prices, for fear that prices would drop even further.

Despite its popularity, the APTT has not escaped criticism. In 2019, the BC Supreme Court heard a case challenging the constitutionality of the tax. The plaintiff argued that the tax is discriminatory, but the case was eventually dismissed. While it is judged to be constitutional, the tax is certainly unorthodox. In the eyes of some, it is a tough, but necessary measure to ensure BC housing is affordable for its residents. This view is only valid if the APTT is indeed an effective tool to cool excessive price growth in the BC housing market. If, on the other hand, the tax proves to be ineffective, it becomes nothing more than a simple revenue raising tool for the province. In 2019, the APTT raised nearly $190MM in revenue for the province, comprising nearly 10% of all property transfer tax revenue. It is questionable whether this is the most efficient or fair way of raising revenue.

There are several limitations to my analysis. First, I do not have a comprehensive sample of all housing in BC. I conduct my analysis using only a single measure of a single style of housing. If foreign purchasers disproportionately prefer apartments as investment vehicles over single-family homes, then the results of my analysis likely understate the total effect of the APTT. Second, I am unable to control for changes in housing supply and other factors that vary across regions over time. For these reasons, my results should be interpreted as a preliminary estimate of the effect of the APTT on single-family house prices in B.C.

7   Conclusion

This paper presents the first estimate of the effects of the Additional Property Transfer Tax, a policy aimed at disincentivizing foreign ownership of residential real estate in British Columbia. I find that the APTT has a small initial effect on house prices, driving a difference of approximately 1% in relative price growth between regions that are affected by the tax and those that are not. My event study reveals that this effect does not persist over time, but rather has a larger initial effect that disappears within 7 months of the implementation of the APTT.

This suggests that foreign buyers in B.C. are not as large of an influence on house price growth, and

consequently house prices, as previously thought. Expectations may be driving the majority of my results: if residential property owners expected the APTT to have a significant effect on prices, they may have sold their properties in anticipation. Another possibility is that foreign purchasers were able to circumvent restrictions on residential real estate purchases. Most importantly, my results suggest that the problem of housing affordability in British Columbia is far from being solved.

8 Appendix

Table 6: Impact of Policies on Log House Price Growth
All Policies Included by Implementation Date

	Ordinary Least Squares		Two-Way Fixed Effects	
	First Wave Only	Both Waves	First Wave Only	Both Waves
APTT	-0.005	-0.004	-0.015	-0.009
	(0.001)***	(0.001)***	(0.001)***	(0.001)***
Empty Homes Tax	0.002	-0.003	-0.003	-0.007
	(0.002)	(0.001)*	(0.002)*	(0.001)***
APTT Increment		-0.004		0.004
		(0.001)**		(0.002)
Speculation and Vacancy Tax		-0.001		0.001
		(0.001)		(0.002)
Observations	5040	6230	5040	6230

Standard errors in parentheses

OLS specifications are eq.(1) without month and city fixed-effects.

First Wave Only specifications limit sample to December 2017. Both Wave specifications do not limit sample.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: Impact of Policies on Log House Price Growth
Representative House Changes Excluded

	Ordinary Least Squares		Two-Way Fixed Effects	
	First Wave Only	Both Waves	First Wave Only	Both Waves
APTT	-0.004	-0.004	-0.013	-0.009
	(0.001)***	(0.001)***	(0.001)***	(0.001)***
Empty Homes Tax	0.002	-0.003	-0.004	-0.007
	(0.002)	(0.001)*	(0.001)**	(0.001)***
APTT Increment		-0.005		0.002
		(0.001)***		(0.002)
Speculation and Vacancy Tax		-0.000		0.001
		(0.001)		(0.002)
Observations	4464	5378	4464	5378

Standard errors in parentheses

OLS specifications are eq.(1) without month and city fixed-effects.

First Wave Only specifications limit sample to December 2017. Both Wave specifications do not limit sample.

Regions with HPI representative house changes are excluded from sample.

Policies included by annoucement date.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 8: Impact of Policies on Log House Price Growth
Single Dummy for Representative House Change

	Ordinary Least Squares		Two-Way Fixed Effects	
	First Wave Only	Both Waves	First Wave Only	Both Waves
APTT	-0.004	-0.003	-0.014	-0.009
	(0.001)***	(0.001)***	(0.001)***	(0.001)***
Empty Homes Tax	-0.004	-0.005	-0.005	-0.007
	(0.003)	(0.001)***	(0.002)***	(0.001)***
APTT Extension		0.000		0.011
		(0.002)		(0.003)***
Speculation and Vacancy Tax		-0.005		-0.009
		(0.002)*		(0.003)***
Observations	5040	6230	5040	6230

Standard errors in parentheses

OLS specifications are eq.(1) without month and city fixed-effects.

First Wave Only specifications limit sample to December 2017. Both Wave specifications do not limit sample.

Policies included by announcement date

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 9: Impact of APTT on Log House Price Growth by Month

	First Wave	Both Waves
-9	0.011	0.012
	(0.004)*	(0.003)***
-8	0.012	-0.004
	(0.004)**	(0.003)
-7	0.009	0.005
	(0.004)*	(0.003)
-6	0.008	0.001
	(0.004)	(0.003)
-5	0.006	0.002
	(0.004)	(0.003)
-4	-0.003	-0.001
	(0.004)	(0.003)
-3	0.014	0.011
	(0.004)**	(0.003)***
-2	0.029	0.013
	(0.004)***	(0.003)***
-1	0.007	0.011
	(0.004)	(0.003)***
1	-0.017	-0.001
	(0.004)***	(0.003)
2	-0.021	-0.006
	(0.004)***	(0.003)
3	-0.028	-0.013
	(0.004)***	(0.003)***
4	-0.024	-0.006
	(0.004)***	(0.003)*
5	-0.021	-0.007
	(0.004)***	(0.003)*
6	-0.019	0.003
	(0.004)***	(0.003)
7	-0.006	0.004
	(0.004)	(0.003)
8	-0.009	-0.003
	(0.004)*	(0.003)
9	-0.005	-0.004
	(0.004)	(0.003)
10	-0.003	0.008
	(0.004)	(0.003)*
Observations	4936	6230

Standard errors in parentheses

Results are plotted in figures 2 and 4.

First Wave Only specification limits sample to December 2017.

Both Waves specification does not limit sample.

Month 1 corresponds to first month after APTT is announced

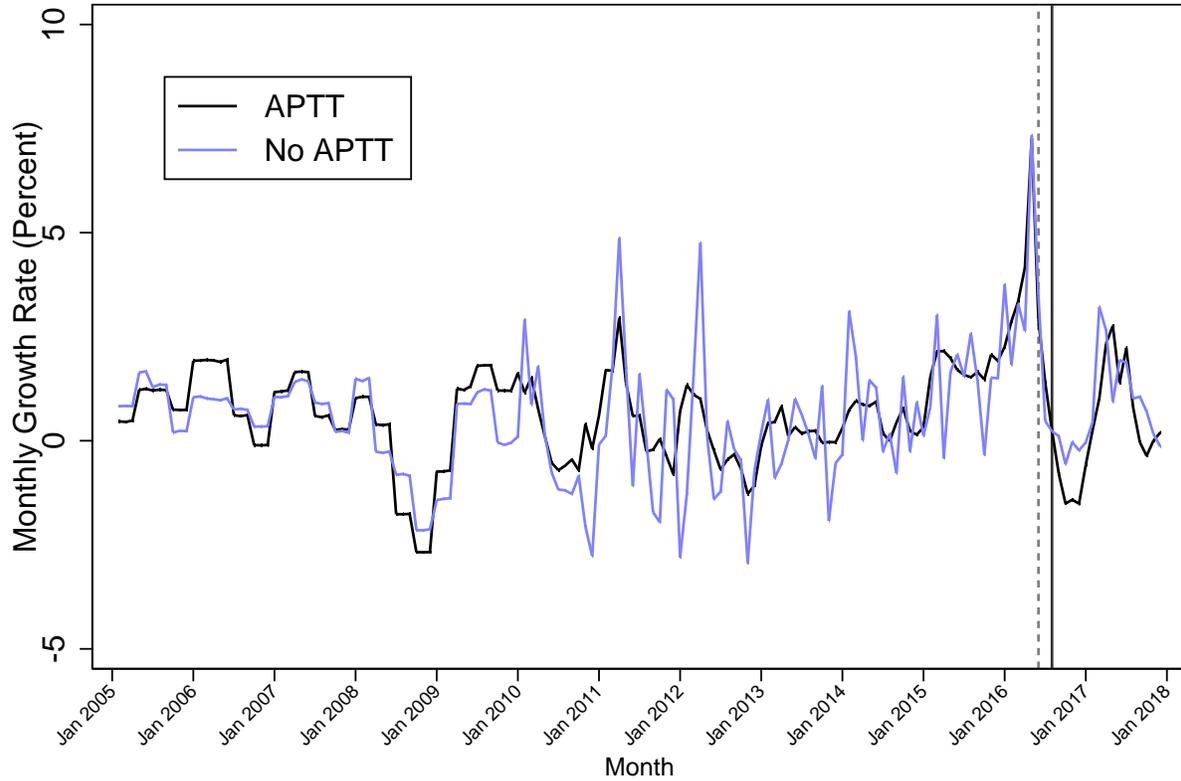* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 3: Greater Vancouver real estate Board data only (Available from January 2005 to December 2019). Other regions are omitted because data are not available for the entire time horizon. The series represented by a solid line comprises regions where the APTT is eventually implemented (APTT announcement date represented by dashed vertical line, implementation date represented by solid vertical line). The APTT is not implemented in the blue line regions over this time horizon.
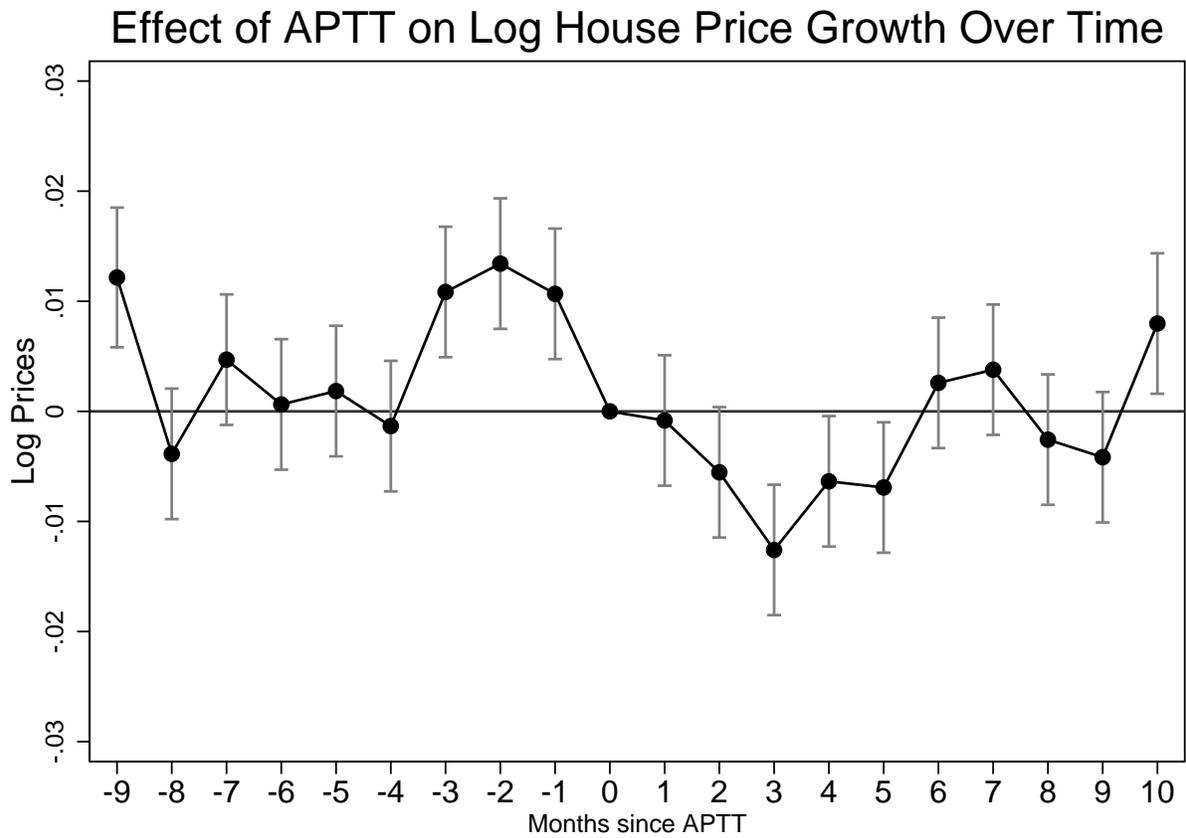
Figure 4: Event study results. Coefficients on APTT from eq.(2) displayed. Time 0 corresponds to APTT announcement date.

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