

# Reconnecting the Housing Market to the Labour Market: Foreign Ownership and Housing Affordability in Urban Canada

**JOSHUA C. GORDON**

*School of Public Policy, Simon Fraser University, Burnaby, British Columbia*

Toronto et Vancouver ont été aux prises avec de graves problèmes d'abordabilité du logement au cours des dernières années. L'auteur étudie l'une des sources importantes de ces difficultés : la propriété étrangère. La propriété étrangère contribue à dissocier le marché du logement du marché du travail, ce qui entraîne à la hausse les prix du marché pour les formes de logement prisées, au-delà de ce que les revenus de la population locale lui permettent de s'offrir. L'auteur se penche sur le rôle joué par la propriété étrangère dans les récentes crises du logement de Toronto et de Vancouver avant de proposer quelques choix politiques envisageables pour faire face à cette dynamique. Il conclut que certains mécanismes de taxation continue à taux élevés de la propriété étrangère s'imposent dans les principales régions urbaines du pays. Les taxes visant les acheteurs étrangers et la taxe sur la spéculation et l'inoccupation de la Colombie-Britannique sont évaluées dans ce contexte.

**Mots clés :** abordabilité du logement, propriété étrangère, Toronto, Vancouver

Toronto and Vancouver have been struggling with intense housing affordability problems in recent years. This article looks at one important factor in these affordability challenges: foreign ownership. Foreign ownership helps decouple the housing market from the labour market, pushing market prices for prized forms of housing beyond what local incomes can afford. The author investigates the role played by foreign ownership in the recent housing crises in Toronto and Vancouver before presenting a few possible policy approaches to address this dynamic. He concludes that some means of continuously taxing foreign ownership at a steep rate is needed in core urban regions of the country. Foreign buyer taxes and the Speculation and Vacancy Tax in British Columbia are evaluated in that context.

**Keywords:** foreign ownership, housing affordability, Toronto, Vancouver

## Introduction

There is a weakness in the Canadian tax system that exacerbates housing affordability challenges in select cities. This flaw has been revealed most clearly in recent years, but the problem is longstanding (e.g., [Ley 2010](#); [Tomlinson 2015](#); [Young 2016c](#)). The central issue is that individuals with foreign income or wealth can own property in major Canadian cities on advantageous terms. Whereas most citizens must pay a substantial amount of income tax on the road to home ownership, those with foreign income or wealth can potentially bypass this contribution. As a result, the various social services and amenities that

accompany living in urban Canada – paid for in substantial part by income taxes – can sometimes be obtained by an international elite for the modest cost of property taxes.

To appreciate the importance of this dynamic, consider the situation of two potential buyers in a Canadian city. Both make a substantial income, yet one earns that income abroad, whereas the other earns it locally. In this hypothetical case, these buyers make around \$200,000 a year and are hoping to purchase a property in the \$1 million range. The local buyer will pay roughly \$70,000 or more in income taxes in most provinces every year. However, the buyer with foreign income need not pay any income

taxes if that buyer is deemed non-tax resident in Canada; instead, he or she will pay taxes abroad, possibly in a low-tax jurisdiction.

Under various tax treaties, if individuals can demonstrate that their “centre of vital interests” lies abroad, then their income will be taxed there.<sup>1</sup> This determination is based on a host of factors, including where they spend most of their time, their typical work location, their family’s location, and their membership in organizations. For businesspeople who work primarily abroad, a claim of non-residency along these lines can be made successfully, even when the family resides in Canada. In some cases, the property can be purchased by a close family member who acts as a proxy owner. In that situation, transfers to family members can be treated as gifts. The Canada Revenue Agency often does not challenge this situation, in part because of the investigative resources required to do so successfully (see Tomlinson 2015; Young 2016a, 2016b, 2016c).

The upshot of this situation is that each year, wealthy families from around the world are potentially given a major subsidy by, or advantage relative to, local taxpayers. Both groups enjoy the same amenities that are achieved in a relatively high-tax jurisdiction: public safety, high-quality infrastructure, environmental protections, and so on. Moreover, if these families achieve citizenship or permanent residency, then both groups will have access to social services such as education, health care, and public pensions. Yet only local residents will be required to pay the full amount of taxes to support these various benefits.

For wealthy individuals abroad, this is an attractive proposition. Citizenship or permanent residency is therefore highly sought after, but often without a commitment to the local labour market or to paying high rates of income tax. Canadian governments for many years encouraged precisely this dynamic with wealth-based immigration programs, especially the Investor Immigration Program (IIP; see next section and CIC 2014; Ley 2010, 2017). Although the IIP was cancelled in 2014, a similar program remains in place in Quebec (the QIIP), and many immigrants to Canada arrive with substantial wealth through the economic or points stream of the immigration system.

If this phenomenon was dispersed and small in scale, the impact on housing prices would likely not be substantial. However, the flows of wealth migration have been significant in recent decades, and they have been concentrated on two metropolitan areas, Toronto and Vancouver.<sup>2</sup> The result has been housing markets that are increasingly decoupled from their labour markets (Ley 2017; Moos and Skaburskis 2010). In particular, the accumulating financial advantage described earlier means that expensive housing is increasingly owned by those using international wealth or income. Although prime areas will see the highest concentration of such buying, other, lower-priced areas will see strong spillover or knock-on effects (see the next section). The result of these

dynamics can be intense demand conditions, especially if a wave of foreign buying suddenly takes place, leading to rapidly rising house prices.

In this article, I contend, and document, that these dynamics have been important in the Toronto and Vancouver housing markets in recent years. I examine the case for this interpretation in the following section. In the sections “Foreign Buyer Taxes” and “Property Surtaxes on Foreign Ownership,” I evaluate the policy alternatives so far attempted by Canadian governments to address this problematic dynamic. In the former section, I evaluate the impact of the foreign buyer taxes imposed in British Columbia and Ontario; in the latter section, I look at the recently implemented Speculation and Vacancy Tax in British Columbia. The final section concludes.

### **Diagnosing Unaffordability: Foreign Demand and Housing Prices in Toronto and Vancouver**

In this section, I investigate the role that foreign demand has played in the housing affordability challenges faced by Toronto and Vancouver. I do not attempt to provide an exhaustive examination of this question, given space constraints (see also Gordon 2016; Grigoryeva and Ley 2019; Ley 2010, 2017; Moos and Skaburskis 2010). Nevertheless, there is strong evidence that foreign demand has exacerbated existing affordability challenges in these cities. This is particularly true of recent years, which are a focus here.

One important conceptual point should be established at the outset. Discussions around foreign demand or foreign ownership have sometimes focused on the question of citizenship (e.g., foreign buyers). Yet, as the introduction makes clear, what matters is not so much citizenship but rather the source of funds for real estate purchases, and whether those foreign funds are taxed as income by Canadian authorities. Foreign ownership is therefore best defined as “housing purchased primarily with income or wealth earned abroad and not taxed as income in Canada.”

Citizenship is not central to the definition because the way that foreign money will affect housing prices does not depend on citizenship; what matters is whether housing is purchased with local income or not. If housing is purchased with non-local incomes, then the housing market can become decoupled from local incomes, generating affordability problems for local buyers: housing prices will cease to merely reflect local incomes or fundamentals and will reflect the prices that wealthy non-local buyers are willing to pay. Thus, although foreign citizenship is usually a safe proxy for foreign money, it is not the whole story because permanent residents and Canadian citizens can use foreign money, too. Once this is understood, the impact of foreign ownership becomes clearer, and one can make better sense of the trajectory of the Canadian housing market.

Although this may be clear conceptually, Canadian governments have unfortunately not collected good,

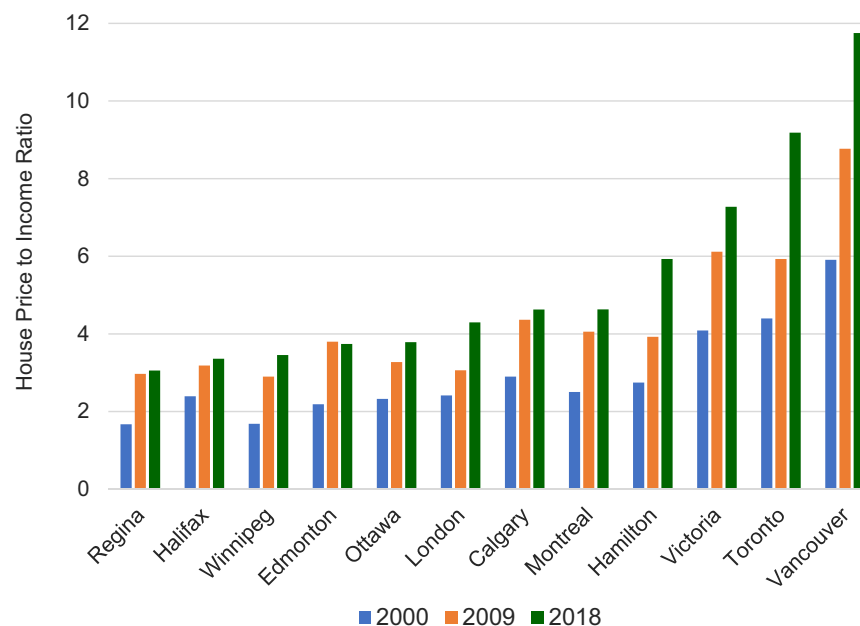
long-term data on patterns of foreign ownership, either by citizenship or based on flows of capital. This means that examination of the impact of foreign ownership must sometimes be done in unorthodox ways. The standard approach in the field might be to run regressions on Canadian housing prices with time-series cross-sectional analysis. In such an approach, average house prices in city  $j$  at time  $t$  would be the dependent variable, and a series of relevant independent variables would be introduced to explain those prices: mortgage rates, household formation, income growth, foreign buying, estimates of supply constraints, and so on. The problem is that researchers do not currently have precise, longitudinal measures of either foreign buying or supply constraints, two of the central alleged causal factors.<sup>3</sup> This means that any regression analysis that proceeds without them is going to suffer from an omitted-variable bias problem.<sup>4</sup> In turn, that means that a proper analysis of the broader Canadian housing market must for the moment rely principally on inference, using the evolution of house prices across cities and (sometimes estimated or proxied) changes in the main independent variables to put together a compelling causal account. Nevertheless, strong evidence for the impact of foreign ownership also emerges from the limited government data on the subject, which are available through a recent federal initiative called the Canada Housing Statistics Program (CHSP).<sup>5</sup> I present both types of analysis in this article.

The first step in undertaking this analysis is to understand the nature of house price appreciation in recent

years and the variations in housing affordability that exist across Canadian cities. This is the empirical pattern that any satisfactory account must explain. Figures 1–2 provide some of the central features to be explained.

Three things stand out in these figures. First is the degree to which Vancouver and Toronto stand apart from other Canadian cities in their affordability challenges. Figure 1 uses the average house-price-to-median-income ratio to show this. This is a standard measure of affordability, a relationship of incomes to housing costs, and other metrics tell the same story.<sup>6</sup> Although these two cities have long been more expensive than other Canadian cities, Figures 1 and 2 also show just how dramatically prices have appreciated in recent years. This recent dramatic price explosion is a second notable pattern in these figures, and the divergence between the other major Canadian cities and Toronto and Vancouver is stark. Even as prices surged in the latter two cities, prices were stagnant or declining in many other Canadian cities. (Hamilton and Victoria, which experience spill-over price pressures, also tracked Toronto and Vancouver, respectively.) Last is the sharp reversal in trend that occurs nearly coincident with the introduction of foreign buyer taxes in Toronto (the Non-Resident Speculation Tax [NRST]) and Vancouver (the Foreign Buyer Tax [FBT]), as well as the announcement of the Speculation and Vacancy Tax (SVT) in British Columbia.

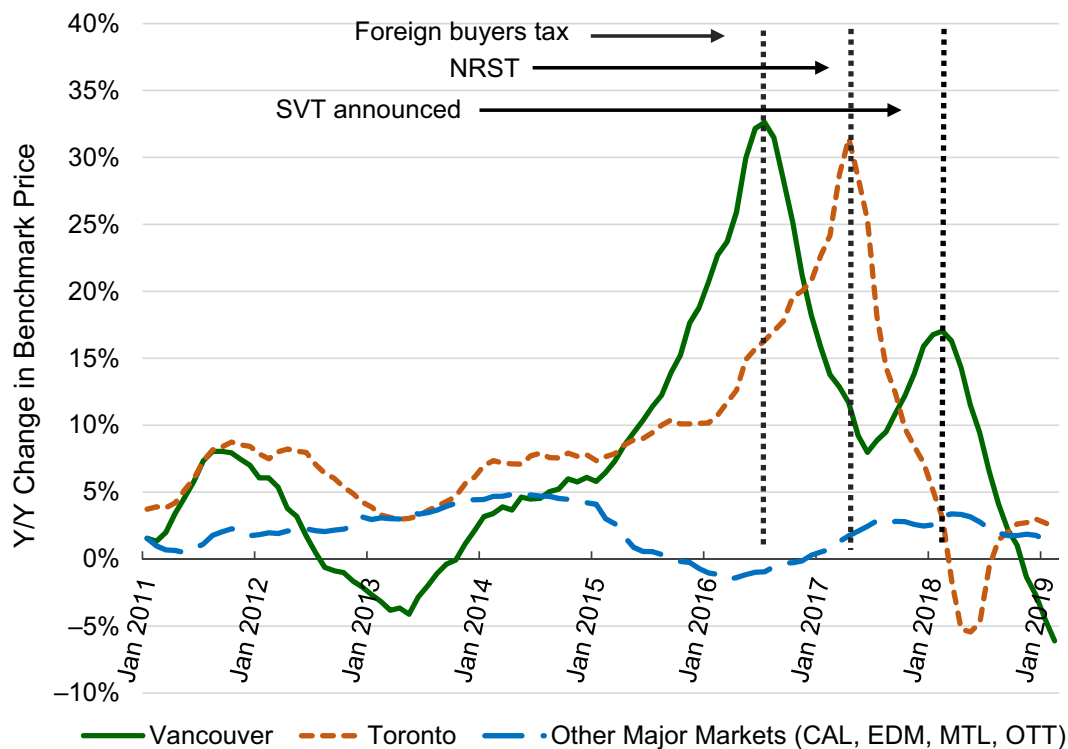
These empirical patterns put in doubt some of the common explanations for the affordability crisis. For one, the disparity in price-to-income ratios between other major



**Figure 1:** Average House-Price-to-Income Ratios, Select Canadian Cities, 2000–2018

Notes: This ratio compares the average residential sale price by city with its median family income. Recent income data are based on extrapolating average income growth over the prior three years.

Sources: Bank of Montreal; Canadian Real Estate Association; Statistics Canada.



**Figure 2:** Year over Year Trends in Teranet House Price Index, January 2011–January 2019

Notes: CAL = Calgary; EDM = Edmonton; MTL = Montreal; NRST = Non-Resident Speculation Tax; OTT = Ottawa; SVT = Speculation and Vacancy Tax; Y/Y = year over year.

Source: Teranet; Canadian Real Estate Association.

Canadian cities and Toronto and Vancouver suggests that common national factors, such as low interest rates or mortgage regulation, are not the primary drivers of housing prices—or that they must at least be understood in combination (or interaction) with other factors. It should also be noted that the price explosion occurred well after interest rates were sharply lowered after the 2008 financial crisis. Growing incomes do not help explain Figure 1 either, because the measure is a ratio of housing prices to incomes. Indeed, as is logically required, incomes have lagged sharply behind house prices. Nor was population growth particularly strong in Toronto and Vancouver relative to other cities, at least relative to city size. Indeed, population growth between 2011 and 2016 was slower in those two cities than it was from 2006 to 2011, and the rate of population growth lagged behind that of several other major Canadian cities.<sup>7</sup>

In sum, the typical factors that have been pointed to in recent analyses (e.g., CMHC 2018)—interest rates, income growth, and household formation—do not do an adequate job of explaining the trajectory of housing prices in Toronto and Vancouver. Some other factors must be involved in the sharp escalation in prices, factors that are specific to these cities.

A prominent factor in the debate has been supposed supply constraints (e.g., CMHC 2018; Green et al. 2016). In

this supply-side view, various regulatory and geographical constraints to homebuilding have caused prices to escalate sharply in the face of rising demand. Although this account might be able to explain the unique trajectory of the two cities, there are both empirical and theoretical problems with this interpretation of the recent period. For reasons of space, these supply-side accounts cannot be discussed at length (for this, see Gordon 2017a). Nevertheless, reasons for skepticism of the supply-side interpretation can be spelled out briefly.

First, empirically, there is no indication that there has been a slowdown in construction activity in recent years, either leading up to the surge in prices or as prices surged. In fact, historically high rates of new housing construction, either in absolute terms or relative to population growth, have been witnessed for several years in both Toronto and, especially, Vancouver (see, e.g., Gordon 2017a; UDI 2014, 2017). There is also little evidence of new, onerous supply restrictions or regulations being introduced in the years immediately preceding the price surge. This suggests that changes on the demand side are more plausible as explanations of the dramatic acceleration in housing prices.

Second, theoretically, supply-side diagnoses sometimes confuse short-term inelasticity with longer-term supply problems. Because developing land into new



housing often takes significant time, even under ideal conditions, sudden increases in demand will cause house prices to escalate in the short run. This inevitable short-term inelasticity is why even cities with highly elastic longer-term supply conditions, such as Phoenix and Orlando, experienced rapid price gains (and sharp price falls) in the 2000s housing boom as a result of loose credit conditions. Consistent with this view, Davidoff (2013) finds that there was no significant relationship between indicators of supply elasticity in the United States and the magnitude of cities' price fluctuations in the 2000s. Therefore, sharply escalating prices are not necessarily a sign of strict regulatory or geographical supply constraints. Indeed, condo prices appreciated only modestly from 2010 until 2015 in both Toronto and Vancouver (see the "Foreign Buyer Taxes" section), suggesting that longer-term supply elasticity problems may be overstated: both cities supplied a sufficient number of new condo units to keep condo prices stable in this period, and no slowdown in condo completions occurred from 2015 on that might explain a surge in prices (CMHC 2019).

Another theoretical issue with supply-side diagnoses is that they suggest that development charges or fees are simply passed on to buyers. However, this misunderstands the economics of housing development in desirable, high-cost markets: because such development fees or costs are factored into the developers' plans from the start of the process, they typically affect the cost of land — that is, how much developers bid on developable land — rather than the final purchase price (Coriolis 2014). In short, development fees come out of land costs. Moreover, there is limited evidence that at current rates such charges have slowed development (Coriolis 2014). This means that if regulatory fees go up, at least in areas where the cost of land is high, the main effect will simply be to depress the price of land, not to increase the final price of units.

A final theoretical concern with supply-side accounts is that they frequently ignore what might be called *induced demand*: as new housing is built in attractive cities, it simply draws in more people, either domestically or among new immigrants. This means that cities are constrained in what they can achieve in terms of affordability through zoning deregulation. Aura and Davidoff (2008) model this dynamic and find that for plausible parameterizations of demand elasticity in desirable cities, the deregulation of land use is unlikely to have much effect on prices.

For these reasons, housing price differences among big cities will mainly reflect demand-side factors in long-run equilibrium (see Aura and Davidoff 2008; Davidoff 2016). Whether high prices can be achieved for new units depends mostly on whether the city in question is attractive (amenities), as well as its income and employment levels, its projected growth, prevailing mortgage rates and rules, and patterns of non-local buying. Supply-side studies that find significant effects of regulatory constraints (e.g., Saiz

2010) are likely relying at least in part on spurious correlation (for this argument and evidence, see Davidoff 2016). Growing, desirable cities with highly educated populations are typically those most likely to impose restraints on growth through regulation. As a result, the former (demand) factors that generate high prices will be correlated with regulatory restraints (supply inelasticity). In regression analysis, only by carefully controlling for the demand-side factors can one be sure that supply constraints are generating high prices. However, supply-side studies have often not done this carefully. Davidoff (2016) shows that once one does, the estimated causal effects of supply constraints greatly weaken in regression analyses.

If supply constraints and standard demand fundamentals are not likely to account well for the sharp increase in prices in recent years, this leaves two other factors to examine: foreign demand and speculative activity. Each can generate extremely strong demand pressures that will drive prices up, especially given short-term supply inelasticity (e.g., Chincó and Mayer 2015). In addition, substantial foreign ownership can decouple housing prices from local incomes in a longer-term way, as has been witnessed in both Toronto and (especially) Vancouver (e.g., Ley 2010; Moos and Skaburskis 2010). I investigate these possibilities next, first by looking at decoupling in the detached housing markets of Toronto and Vancouver and second by looking at the dynamics around price appreciation in recent years.

### **Foreign Ownership and Decoupling in the Detached Housing Markets of Toronto and Vancouver**

The decoupling of housing prices from local incomes can occur when there is substantial foreign ownership in a market, defined as the use of (untaxed) foreign income and wealth for housing purchases (Ley 2017; Moos and Skaburskis 2010). There are good grounds to suspect that foreign ownership has played a role in the Toronto and Vancouver housing markets, given the history of investor immigration in Canada (e.g., Ley 2010). The IIP was set up in 1986 in an attempt to spur investment in the Canadian economy by wealthy individuals from around the world. At the time, a particular target for recruitment was people in Hong Kong, who feared what might happen to their assets with the transfer of power to Beijing in 1997 (Ley 2017). Subsequently, the program was dominated by individuals from Greater China (the People's Republic of China, Hong Kong, Taiwan); around three-quarters of those who entered the program in the first two decades were from this region (a fact relevant to evidence provided in the next section). Investor immigrants were initially required to lend Canadian governments \$400,000 interest-free for five years as a condition for entry and to have a net worth of more than \$800,000. These sums were subsequently doubled in 2010.

The majority of those who arrived in the IIP stream eventually settled in British Columbia (Vancouver), and Ontario (Toronto) was the second most popular destination. From 2007 to 2011, for example, 64 percent of investor immigrants had British Columbia as their intended destination, whereas 32 percent had Ontario (CIC 2014). This indicates a concentrated pattern of settlement in Toronto and Vancouver. The numbers were also substantial. Although precise numbers are hard to come by for the entire period of the program, Ley (2017) estimates that nearly 200,000 people arrived in Vancouver through the IIP and other business immigration programs from 1986 to 2012—roughly 8–9 percent of the regional population.

Although the initial intention of the program was for investor immigrants (IIPs) to invest in local business and spur innovation in the Canadian economy, a 2014 study by CIC suggests that most did not do this. This is apparent from the income tax returns of IIPs: the average annual income tax paid by IIPs in the first 10 years after landing was merely \$1,400 (CIC 2014). Rather than engage in the labour market or establish businesses, most investor immigrants appeared to be using the program as a way of hedging political risks in their home countries, and to the extent that investment took place, it was in real estate (Ley 2010). Often, the family of the breadwinner would move to Canada, in part for educational opportunities, whereas the businessperson—82.5 percent of applicants were male—would remain in the country of origin for much of the time (thereby allowing income tax to be paid in that country, rather than Canada; see Ley 2010). This scenario is usually termed a *satellite family*.

Despite this, IIPs typically purchased expensive housing because they would arrive with significant wealth. For example, on the basis of CHSP data, the median assessed value in 2017 of detached properties owned by recent IIPs in Vancouver was roughly \$2.55 million, more than double the median detached house value in the region (\$1.25 million; Gellatly and Morissette 2019). This dynamic fostered the decoupling of housing markets from the local labour market—or a misalignment of housing values with local (declared) incomes (Moos and Skaburskis 2010). Over time, this pattern gradually raised the price of detached housing—the prized form of housing—especially in areas in which this buying was concentrated.

This can happen in two broad ways. First, there is the compositional (or stock) effect: households with low declared incomes and high housing values, as in the case of a satellite family, represent an embodied version of the decoupling phenomenon. To use government figures, if IIPs have on average declared around \$20,000 in taxable income (CIC 2014) but own detached properties worth on average (median) \$2.5 million (Gellatly and Morissette 2019), then that will represent an embodied or individualized price-to-income ratio of around 125. If there are a substantial number of such situations, then the

price-to-income ratio in a municipality is likely to be high because it will affect both price (numerator) and income (denominator) statistics.

Second, purchases by buyers using foreign money will set in train potent price-setting dynamics (see Grigoryeva and Ley 2019). For one, an expensive purchase will set a new benchmark in a market, which will inform the subsequent actions of both buyers and sellers, perhaps especially speculative buyers. This can be thought of as the marginal buyer effect. There are also important downstream effects of a large foreign purchase: long-time owners who have their house bought for many times their initial purchase price now have considerable equity both to make a high-priced down-market move—to a smaller detached unit or into the condo market—and to lend to their children or grandchildren, who may use the money to move up in the market. In this manner, one large foreign purchase can turn into several other purchases, all transacted at a higher price than would have occurred had the initial foreign purchase not been made. This can be thought of as the equity effect, or what Grigoryeva and Ley (2019) call replaced demand, and it is likely to affect those areas in which foreign purchases are made most, because of social connections to a locality. Last, those who might have previously bought in higher-tier areas may now be pushed further out (i.e., displaced demand) and will bring greater purchasing power to formerly modest-income neighborhoods, pushing up prices elsewhere, so that prices across a market become disconnected from local incomes. In this way, statistics regarding the number of sales to foreign purchasers may, to a casual observer, understate their effect on a market (see, e.g., Chincio and Mayer 2015).

Before the collection of the CHSP data, patterns of foreign ownership and foreign buying had to be inferred from studies of purchaser names and surveys of realtors (e.g., Ley 2017; Marlow 2014; Yan 2015). With the release of the CHSP data, a much more precise understanding of patterns of foreign ownership, at least in British Columbia, Ontario, and Nova Scotia, is now possible. The CHSP data measure, among other things, the share of properties owned by non-residents, either in whole or in part. Non-resident ownership is not exactly the same as foreign ownership, as defined earlier, but it is a reliable, if conservative, proxy. It is reliable because those who are not resident (tax resident or otherwise) in Canada are unlikely to be using Canadian sources of income or wealth to pay for housing. It is conservative, though, because some who are resident in Canada may still be using untaxed foreign income or wealth in housing transactions (e.g., when only a homemaker or student is listed on a title in a satellite family scenario or in certain types of speculative arrangements).<sup>8</sup> It is likely that the two phenomena are highly correlated, though, at least on a geographical basis, and this allows a more rigorous examination of

the link between decoupling and foreign ownership. In short, it allows an investigation of whether decoupling is associated, on a geographical basis, with higher rates of non-resident (foreign) ownership.

To do this, in this section I look at the detached housing markets in Toronto and Vancouver. I focus on the detached market here for two main reasons. First, this is where the most pronounced decoupling from local incomes is seen, and it is a large part of what drives the very high price-to-income ratios shown in Figure 1 – not the least because dynamics in the detached housing market have strong spillover effects into the condo or apartment market (e.g., displaced demand and the equity effect). Second, by looking at the detached market, one can hold constant certain factors in the analysis that may be relevant in the condo or apartment market, but that may vary by municipality in a way that is difficult to control for. For example, different municipalities have different patterns of regulation that surround the building of new apartments (e.g., development charges, building codes). In the case of detached housing, these variations will not usually apply. Moreover, in most municipalities, the total supply of detached houses is fixed by the land area, which means that supply is inelastic. This means that this element – supply elasticity – can also be held (at least roughly) constant.

Although the CHSP does not currently have a longitudinal (or temporal) component, it does break down non-resident ownership rates at the municipal level, which allows for cross-sectional analysis. The decoupling of detached house prices from local (declared) incomes can thus be compared across each metro region. This furnishes the dependent variable: the ratio of median (detached) assessed value to median income, by municipality. Figure 3 shows one possible measure of decoupling in Metro Vancouver.<sup>9</sup> The degree of divergence in price-to-income ratios in the metro region is striking (Wozny 2017). It calls out for explanation: how have housing prices become so disconnected from local incomes in certain parts of Metro Vancouver, but much less so in others? Banks will typically lend borrower households around three to five times their annual income, yet detached house prices in Richmond, West Vancouver, and the City of Vancouver are more than 20 times the median income of homeowners.

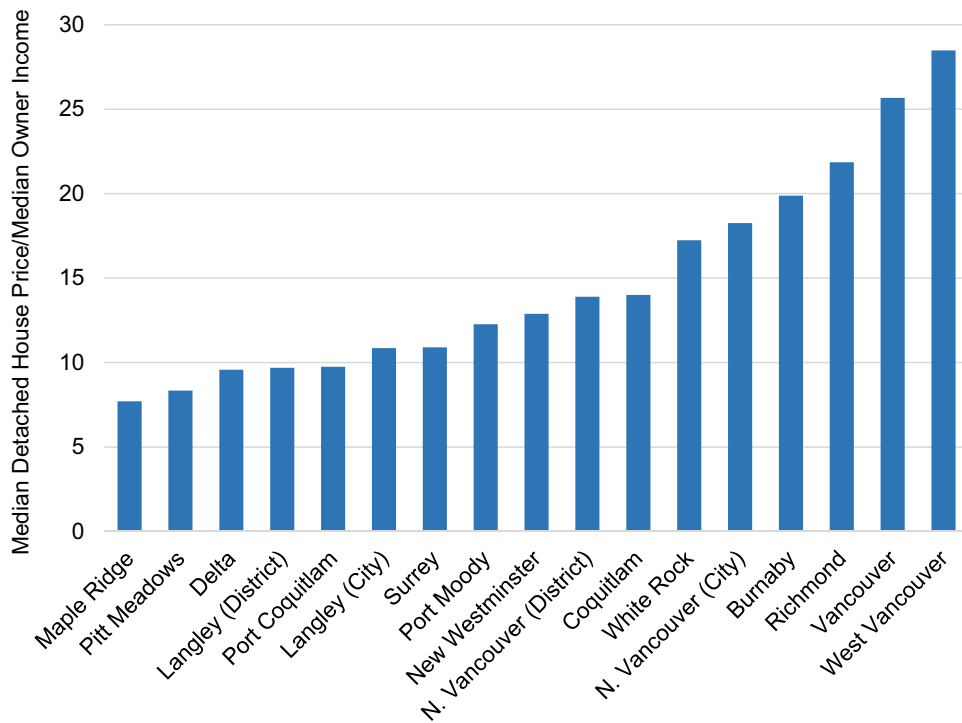
One obvious possibility, given this, is that substantial foreign wealth or undeclared income is being used to purchase housing in some areas much more than in others, as other studies have indicated (e.g., Ley 2010; Moos and Skaburskis 2010). To examine this possibility, one can plot the degree of decoupling against the share of non-resident ownership of detached houses. Figure 4 does this for Metro Vancouver, using the median detached house price relative to the median household income of homeowners. The relationship is very strong ( $r = 0.92$ ). This provides initial support for the hypothesis that foreign ownership is playing a major role in decoupling in Metro Vancouver.

However, to fully test this hypothesis, a number of potentially confounding factors need to be introduced, such as the distance of the municipality from the central business district (because commute time is capitalized in the price of the house), the share of the elderly population (those with low income but substantial wealth), and the share of single-detached properties (because the income statistic in Figures 3 and 4 includes the incomes of not only those who own single detached houses but also of those in apartments, townhomes, etc.). For reasons of space, Appendix A investigates these possible confounders to see whether the relationship remains statistically significant. In every model tested there, non-resident ownership remains statistically significant at the  $\alpha = 0.001$  level, and its coefficient predicts the largest difference in decoupling. In short, the relationship of non-resident ownership to decoupling is robust and substantial.<sup>10</sup>

It is also important to reiterate that the empirical pattern in Figure 3 – with highly varied price-to-income ratios across municipalities – cannot plausibly be explained with reference to many of the alleged alternative causes of high housing prices, such as low interest rates, lax mortgage standards, or supply constraints, because these factors are held constant. Factors such as these would explain high ratios across the metro region, but not the particularly skewed nature of prices to incomes in certain municipalities, nor the degree to which prices had decoupled from incomes.<sup>11</sup>

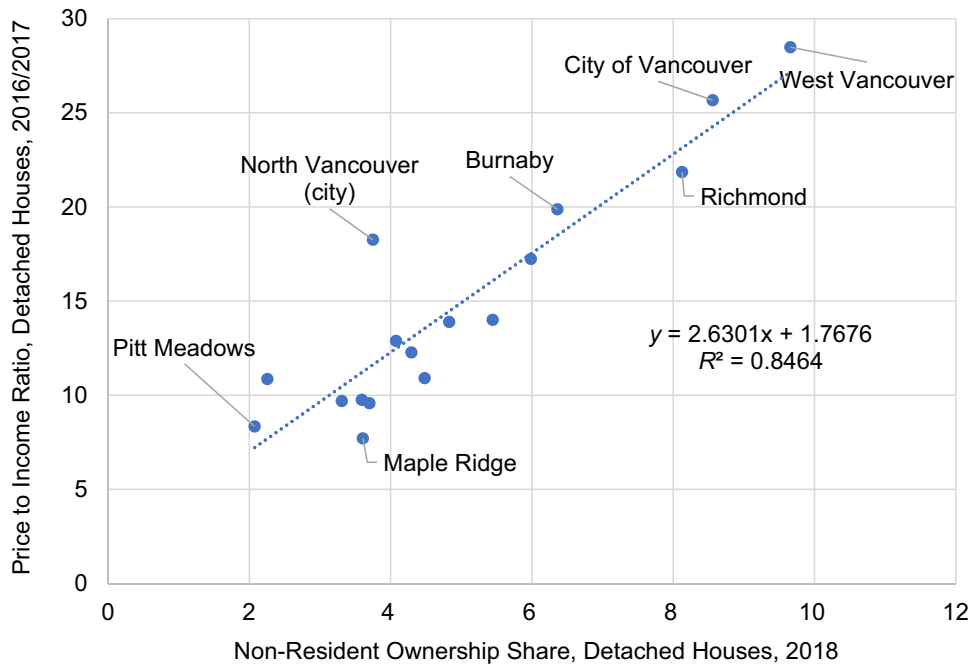
A similar analysis can be conducted for Toronto, for which CHSP data are also available. Figure 5 shows that a divergence in price-to-income ratios exists in the Toronto region, too; however, it is less pronounced than in Vancouver. This is consistent with the history of the IIP and with evidence from the CHSP, which shows the prevalence of foreign ownership to be substantially less than in Vancouver. One can also, as a first pass, examine the bivariate relationship between non-resident ownership and decoupling. Figure 6 presents this relationship. Once again, the relationship is strong ( $r = 0.81$ ). Appendix A investigates other potential confounders, as in the Vancouver case, and finds again that the impact of non-resident ownership is both robust and substantial.

One feature of the bivariate relationships that may appear striking is the relatively modest share of non-resident ownership, especially in Toronto. Could such a modest share of the housing stock have a major impact on housing prices and decoupling? There are three key points to be made here. First, there is the important distinction between stock and flow: the estimates for non-resident ownership are stock figures, but they will likely substantially underestimate the flow of foreign purchases (i.e., the share of current purchases that are non-resident). If the share of housing stock begins at a low level, then moving to a higher stock figure in a short period of time can entail a substantial share of purchases going to non-residents.<sup>12</sup>



**Figure 3:** Price-to-Income Ratio, Detached Houses, Metro Vancouver, 2016–2017

Sources: Canada Housing Statistics Program; Metro Vancouver.



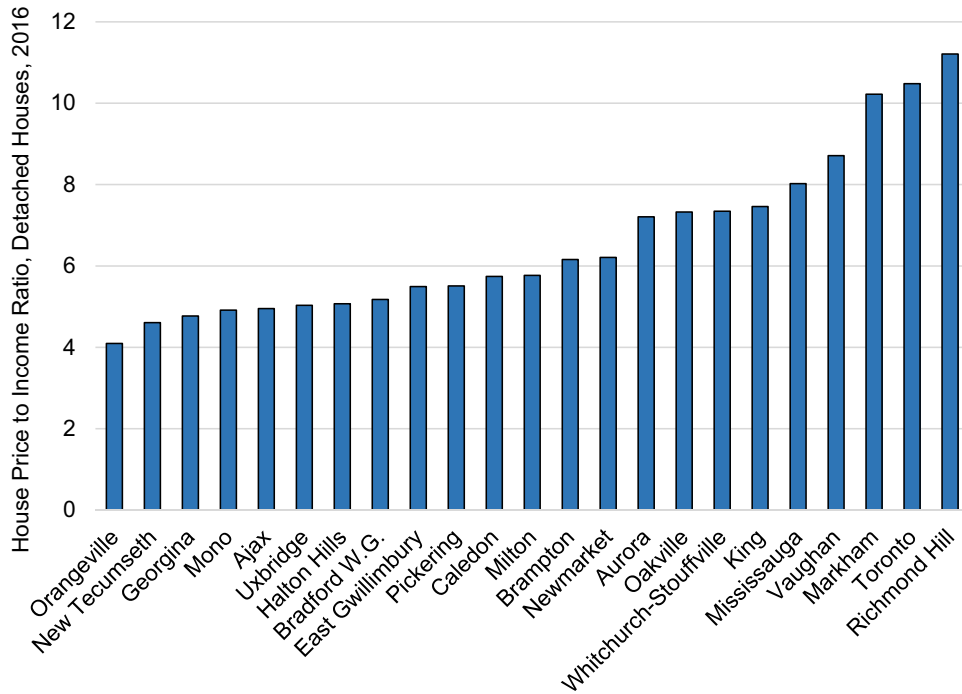
**Figure 4:** Non-Resident Ownership versus Decoupling in Metro Vancouver, 2016–2018

Sources: Canada Housing Statistics Program; Statistics Canada; Metro Vancouver.

It is the flow of foreign purchases that will have the largest impact on prices in the market today, and there are good grounds to suspect that the flow of foreign purchasing has been substantial in recent years, at least up until 2016 or

2017 (see “Recent Surge in Foreign Demand” section). For example, the CHSP data show that although roughly 12.5 percent of the Burnaby condo stock was owned by non-residents, almost double that share of newly built condos

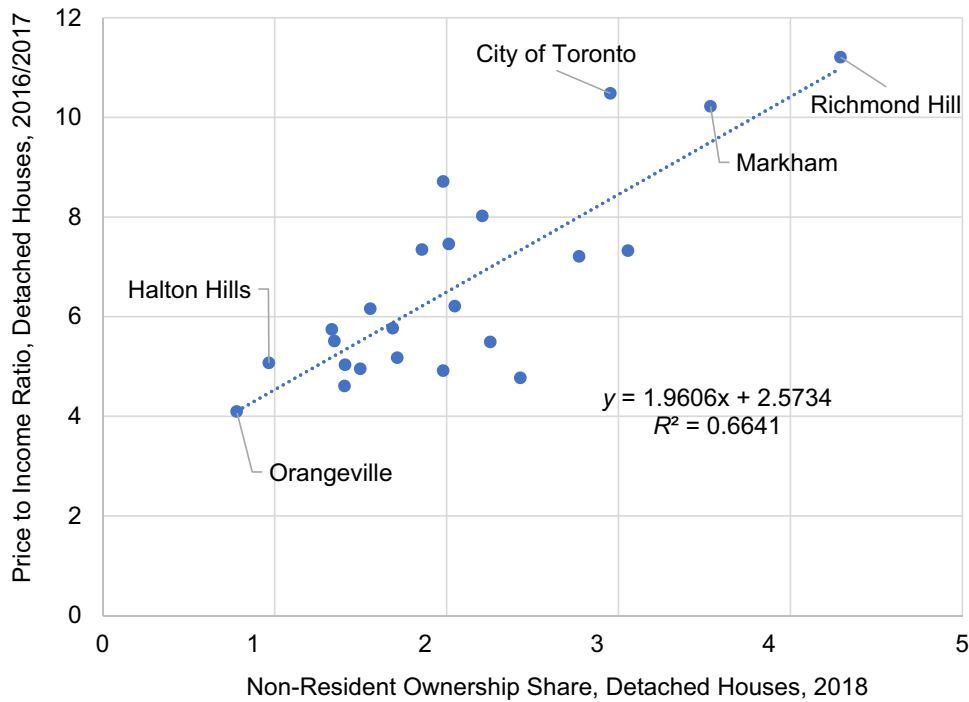




**Figure 5:** Price-to-Income Ratio, Detached Houses, Toronto CMA, 2016

Notes: CMA = census metropolitan area; W.G. = West Gwillimbury.

Sources: Statistics Canada; Canada Housing Statistics Program.



**Figure 6:** Non-Resident Ownership Share versus Decoupling, Toronto, 2016–2018

Sources: Statistics Canada; Canada Housing Statistics Program.

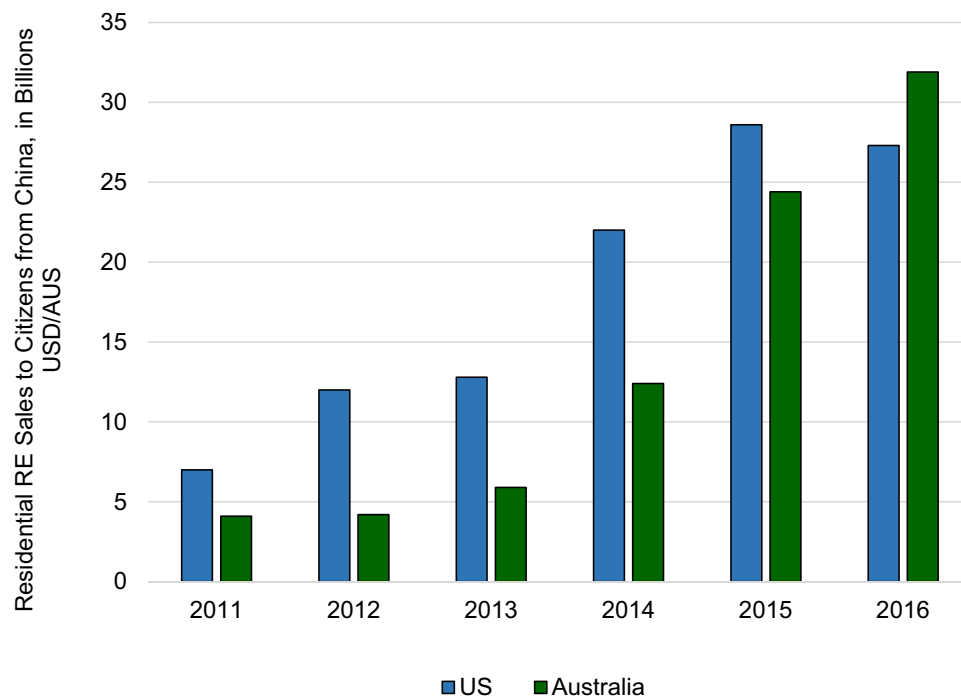
(2016–2017) were owned by non-residents (CHSP, Table 46-10-0022-01). The latter figure is the closest there is to a flow estimate in the CHSP data, and in Metro Vancouver it consistently shows a flow estimate that is almost double the condo stock figure (CHSP, Table 46-10-0022-01). Second, the ownership share figures will not directly capture the potent price-setting dynamics that are entailed by non-resident buying, as discussed earlier. Both the marginal buyer effect and the equity effect are implicated in non-resident ownership, but these effects will be missed if one conceptualizes non-resident buying in a narrow manner. Third, to repeat, the non-resident ownership data represent a conservative estimate of foreign ownership, because they do not include a variety of situations that are properly defined as foreign ownership: a family arriving with substantial wealth but eventually becoming tax resident, a property with only a homemaker on the title in a satellite family situation, and so on. On the basis of past research in this field (e.g., Ley 2010, 2017), there is likely to be a strong geographical correlation between the CHSP non-resident data and these other forms of foreign ownership, which is likely why the non-resident ownership data are such a powerful predictor of decoupling in Toronto and Vancouver.

### Recent Surge in Foreign Demand (2014–2017)

To understand the evolution of the Toronto and Vancouver housing markets, it is helpful to think of two waves of

foreign demand. The first occurred with the steady process of wealth migration, associated foremost with the IIPs. This served to gradually decouple the housing markets in Toronto and Vancouver, as argued earlier. However, there has also been a potent second wave, which has less to do with investor immigration and more to do with capital flight from China. As noted in the introduction, the federal government cancelled the IIP in 2014, after its internal report revealed that the program was not engendering local entrepreneurship. Nevertheless, there is evidence that a surge of money flowed into the housing markets of Toronto and Vancouver from abroad, in particular from China, after the program's cancellation. A crackdown on corruption by Xi Jinping and worries about the condition of the Chinese economy set off a wave of overseas investment by elites beginning around 2014 (see, e.g., Klein 2017; Schell 2016). This was a global phenomenon, and although Canadian governments did not track this carefully, other countries did. Two comparable countries that gathered data are Australia and the United States. Figure 7 shows that residential real estate sales to Chinese citizens increased dramatically from 2013 to 2016.

The evidence for the arrival of this money is again unorthodox, owing to the absence of government-collected data. One proxy is the amount of money seized at the Vancouver airport from citizens of China. Although the sums are modest, they tripled between 2013 and 2015, consistent with the purchasing data in Figure 5 (Hager



**Figure 7:** Chinese Purchases of Residential Real Estate in Australia and the United States, 2011–2016

Notes: Figures for Australia straddle the calendar year (i.e., “2015” is actually for late 2014 and early 2015). RE = real estate.

Sources: Foreign Investment Review Board (Australia), various years; National Association of Realtors (United States), 2016.

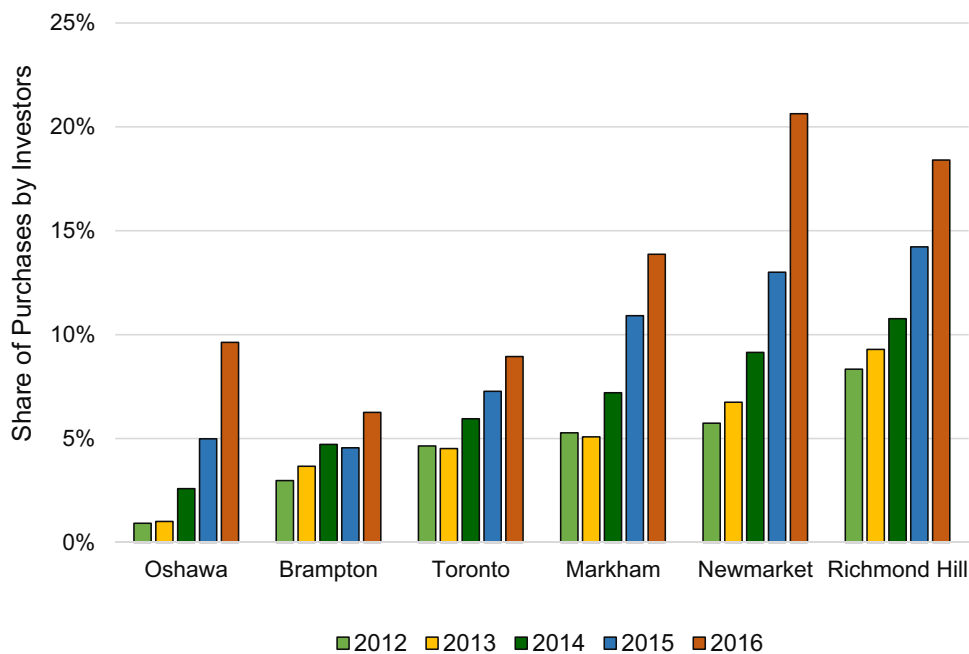
and Tomlinson 2016). Canadian banks also reported a surge of foreign deposits in these years, which again track sales volumes in Toronto and Vancouver well (Caranci, Petramala, and Judge 2017). Perhaps the most telling evidence for this surge in offshore buying is data compiled by John Pasalis and his Toronto-based brokerage, Realosophy. What Pasalis (2017) did was to measure the extent of investor buying in the Greater Toronto Area market: the share of freehold (detached) properties purchased on the Multiple Listings Service (MLS) and then re-listed for rent on the same site within a year. Such a pattern would indicate investment-oriented buying. Figure 8 presents the results of this analysis from 2012 to 2016.

Figure 6 reveals a few telling patterns. First is the steady and substantial uptick in investor buying from 2014 onward, after remaining stable in 2012 and 2013. This is consistent with the trajectory depicted in Figure 5. Second, the pattern of investor buying is highly variegated and is concentrated in areas with a large Chinese–Canadian diaspora and where the rates of non-resident ownership are highest. For example, in the areas in which the Pasalis (2017) data and CHSP data overlap, there is a strong correlation between non-resident ownership share and the amount of investor buying in this period (approximate  $r = 0.75$ ). This variegated pattern also undermines the notion that tight supply conditions across the region were what initially set off speculative buying—or low interest rate conditions, on their own—because if that had been the case, one would expect the entire region to see similar

patterns of buying. Notable, too, is that the Pasalis data would systematically undercount speculative buying because buyers might rent the property on sites other than the MLS or might leave properties empty. It is clear, then, that in some areas speculative activity was substantial and would have served to sharply raise prices (see Chingo and Mayer 2015).

Crucially, the price pressure in the higher-end areas associated with buying by wealthier foreign-sourced buyers would have gradually rippled out, as noted earlier (for this, see Grigoryeva and Ley 2019). This would happen as high-income local buyers were increasingly forced to buy in second-tier areas, and those just beneath them in the income scale were pushed to the third tier, and so on (i.e., displaced demand). House sales to wealthy buyers with foreign money would also generate speculative pressure (marginal buyer effect) and create windfalls for some sellers, which would produce the equity effect, or replaced demand (Grigoryeva and Ley 2019). This ripple effect is illustrated in Figure 9, where the price movement begins at the high end (Westside Vancouver) and then with a lag drags up prices in suburban areas (Surrey; detached) and finally apartment prices (Surrey; condos).

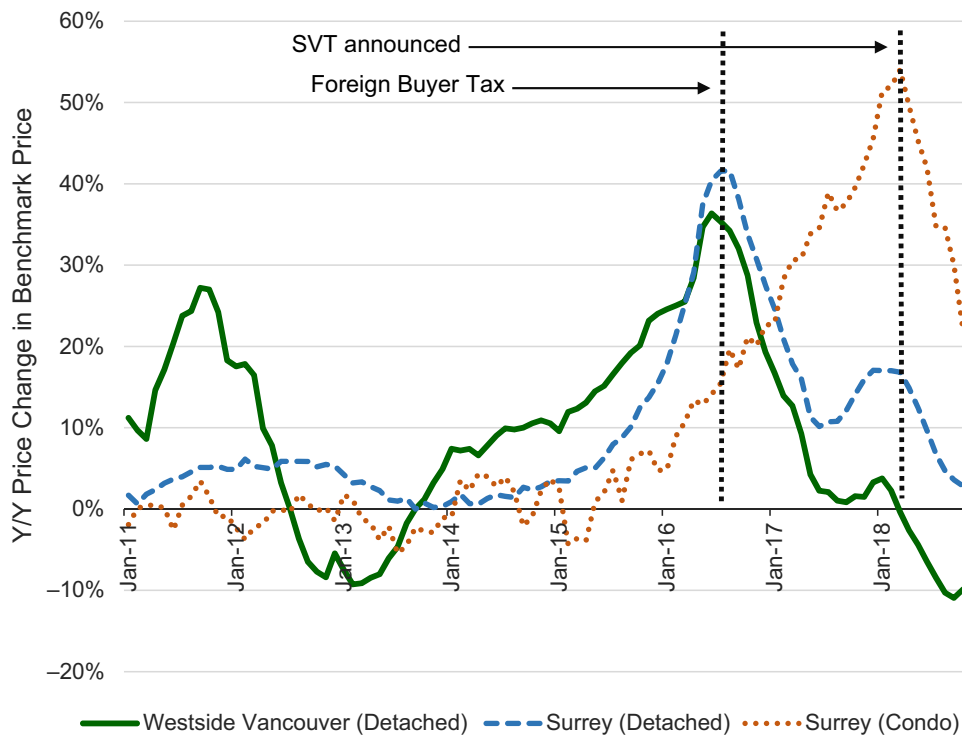
The pattern in Figure 9 also puts in doubt alternative accounts of rising house prices. If house prices were primarily being driven by rising incomes, population growth, and supply constraints, then one would expect prices to steadily climb upward in all segments. However, as Figure 9 makes clear, condo prices—in Surrey and



**Figure 8:** Investor–Speculator Purchases of Freehold (Detached) Housing in GTA, 2012–2016

Notes: Select municipalities or regions have been chosen to illustrate divergent patterns. GTA = Greater Toronto Area.

Source: Pasalis (2017).



**Figure 9:** Ripple effect in Metro Vancouver, 2011–2018

Notes: SVT = Speculation and Vacancy Tax; Y/Y = year over year.

Source: Real Estate Board of Greater Vancouver.

elsewhere—did not grow strongly from late 2010 until mid-2015. The sudden upturn is noteworthy, and it suggests a sharp external stimulus.

### Foreign Buyer Taxes

By the time of British Columbia's FBT, announced in July 2016, prices were escalating at a rate of 30 percent a year or more in the detached segment and rapidly appreciating in the condo market as well (Figure 9). In the face of these dramatic price gains, the BC Liberal Party was pressured to introduce the tax, despite having resisted measures to curtail foreign ownership for years.

Foreign buyer taxes have a number of potential justifications or motivations. Most straightforward, during a period of intense demand for housing, they can serve to discourage one problematic source of demand—that by non-resident buyers. Apart from their effects on decoupling, non-resident buyers can act as misinformed speculators, which can create or exacerbate housing bubble conditions (Chinco and Mayer 2015). By discouraging this demand, the tax can mitigate price pressures. A second important motivation of such taxes is to shift market expectations: they signal that one cause of price appreciation will be removed from the market and perhaps foreshadow future government action to cool housing prices. This policy signal will weaken the incentive of

local buyers to engage in speculative activity or to buy in a panic (fear of missing out) if they foresee endless foreign demand for property in an urban region. Third, such taxes can be used to raise revenues for affordable housing initiatives. In this sense, they operate as a Pigouvian tax: either the problematic behavior is discouraged or revenue is collected to compensate society. Last, as a political matter, they can be sold as putting citizens or local buyers on a level playing field with wealthy foreign buyers, who may not have to pay the income taxes that go toward creating the social services and infrastructure that underpin the value of real estate in urban areas (Gordon 2017b).

Partly because of their Pigouvian nature, these taxes can be introduced with limited information about the market share of foreign buyers. If foreign buyers are a modest share of the market, then the tax will have a limited impact, but it will also not create significant harm. The tax will also collect modest revenues for government use. If, however, foreign buyers make up a substantial share of the market, then such taxes can have an immediate impact on the market and, at least initially, collect sizable revenues.

In the case of the FBT announced in British Columbia in late July 2016 for Metro Vancouver, the government had only about five weeks of data. That data showed, though, that foreign buying was substantial: in that five weeks of data, around 10 percent of all residential home



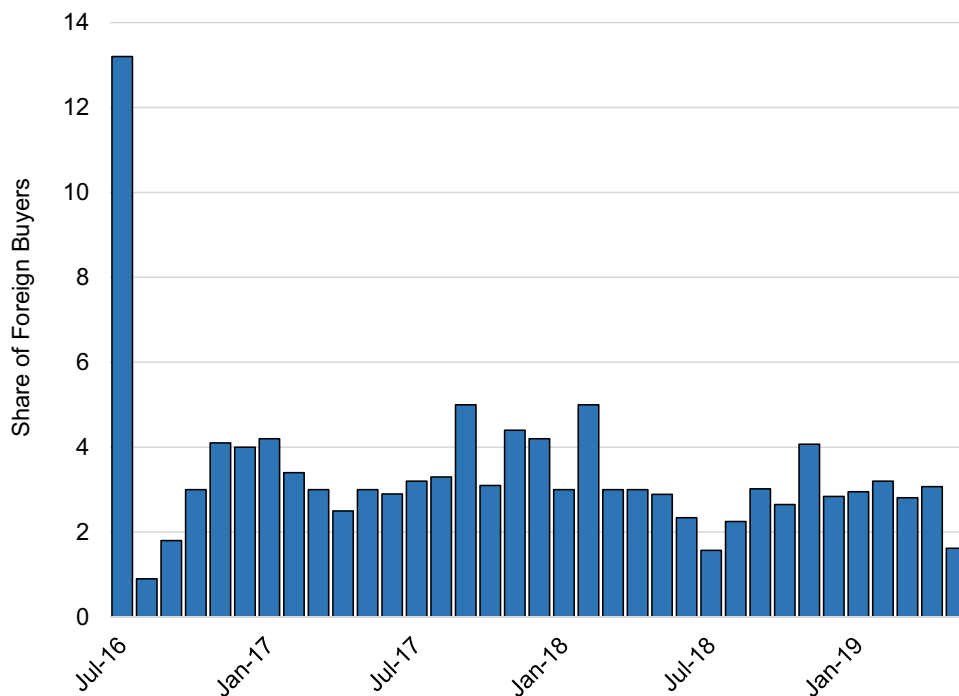
sales were to non-citizen buyers, for a total of nearly \$1 billion. Before its official imposition on 2 August 2016, there was a rush to register purchases, which pushed the share of buyers in a six-week period up to 13 percent as a share of purchases, and roughly 16 percent as a share of sales volume (because foreign buyers spent more on average). Thereafter, buying by non-citizens dropped sharply, as [Figure 10](#) makes clear. Nevertheless, the initial share of buying would likely have had a substantial impact on prices. [Chinco and Mayer \(2015\)](#) estimate, for example, that out-of-town buyers during a housing boom can raise prices by nearly 2 percent for each extra percentage share of buyers they represent.

The impact of the tax was immediate. Sales volume dropped sharply across the Metro Vancouver market, and prices began to drop modestly in some segments. The extent of dropping sales volume—30–40 percent in the months that followed relative to the past year—indicates that the tax discouraged not only foreign buying but also local domestic speculative buying. By January 2017, prices had fallen around 5 percent in the detached market and stabilized in the townhouse and condo markets in the six months since the tax's introduction. This was in sharp contrast to the massive price gains of the recent past, as indicated by the trend reversal in [Figure 9](#).

This slowdown and trend reversal did not last long, however. In Spring 2017, detached house prices regained their upward momentum, and condos continued their

rapid appreciation (see [Figure 9](#)). In part, this reflected two policy moves by the provincial government that worked to undercut some of the effect of the tax: an interest-free loan program to first-time home buyers and exemptions to the FBT for those with work permits. As it turned out, the former program had limited uptake, and the latter did not affect many buyers. Nevertheless, they undermined the effect the tax had on market expectations: just as the tax was starting to drop prices in some segments, the government introduced two measures of effective demand stimulus, which sent a message that the government would act to prop up the market.

This experience also reveals a few important weaknesses to foreign buyer taxes as policies to address affordability challenges. For one, these taxes can be skirted by clever buyers, by having purchases made in the name of proxies or through murky corporate ownership structures. For another, because they are focused on citizenship, they miss wealth migration that occurs through standard immigration channels—or through the QIIP. Moreover, even at a stiff rate of 15 percent, foreign buyers continued to purchase real estate in Vancouver, as [Figure 10](#) shows.<sup>13</sup> Finally, and most important, they do not address the long build-up of foreign ownership. For a decoupled housing market to be re-coupled, foreign ownership needs to be discouraged and contained, regardless of when it was initiated. Because foreign buyer taxes do not do this, their imposition would not pressure existing foreign owners



**Figure 10:** Share of Residential Purchases in Metro Vancouver by Foreign Nationals, 2016–2017

Note: Jul-16 represents the period from 10 June–31 July 2016.

Source: BC Statistics.

or satellite families to sell their housing. This means that, absent a sharp turnaround in expectations, the housing market will not see a sharp increase in inventory in the short term. In turn, that will limit the immediate price relief that such a tax can provide.

The evolution of the Vancouver and Toronto housing markets in recent years illustrates these dynamics. [Figure 11](#) depicts the broad trajectory of the Vancouver market. First, there is a steady increase in sales from 2013 onward, reaching a peak in early 2016 (dashed line). This represents the sharp increase in demand. What the surge in demand did, because there was no notable shift in new listings, was to draw down inventory (active listings) to very low levels (solid black line). The combination of strong demand and low and dwindling inventory is what set housing prices on their rapid ascent, because house price trends reflect the relationship between sales (demand) and active listings (supply).

Second, the FBT slowed demand, because sales fell after its introduction (dashed line). This was as intended, but the tax failed to break speculative expectations, which meant that instead of generating a sharp rise in new listings—because sellers might seek to cash out near the top—new listings in fact fell as sellers held out for higher prices (dotted line in early 2017). This produced persistently tight inventory conditions (flat solid line after August 2016), especially in the condo market, which meant that price pressures remained intense there, as [Figure 9](#) suggests. Third, it took a second major policy intervention, the provincial budget in February 2018, to shift speculative expectations and to once again dampen demand conditions. As sales volumes fell again, inventory began to climb.

The experience in Toronto with a foreign buyer tax was somewhat different. In Toronto, the same pattern of a demand surge is evident in [Figure 12](#) from 2013 onward (dashed line). Similar to Vancouver, this demand surge sharply drew down inventory levels (solid black line), creating very intense price pressures in 2016 and especially in early 2017.<sup>14</sup> As the housing crisis rapidly intensified in early 2017, the Ontario government was pressured to adopt a foreign buyer tax of its own in April 2017. The NRST was set at the same rate of 15 percent; however, it had a range of exemptions from the start: foreign students who had been enrolled for two or more years full time would be eligible for a rebate, as would those who became citizens within four years of the purchase or those who worked full time for a year in Canada on a valid work permit. As a result, the NRST was a weaker form of the FBT in Vancouver. Indeed, these exemptions are problematic, because only the latter ensures a connection to the labour market and Canadian taxation, and only for a year. A better approach would have been to refund the tax proportionate to the amount of income tax paid in a three- to four-year period after a purchase. Despite these

flaws, its impact proved more substantial than the tax in Vancouver, because the tax more profoundly shifted market expectations, not only initiating a sharp slowdown in sales but also generating a sudden increase in new listings. The consequence was steeply rising inventory. By August 2017, four months after the tax, inventory had surged around 100 percent, and prices began dropping steeply: in December 2017, the average sale price was down roughly 20 percent from the peak in April 2017.

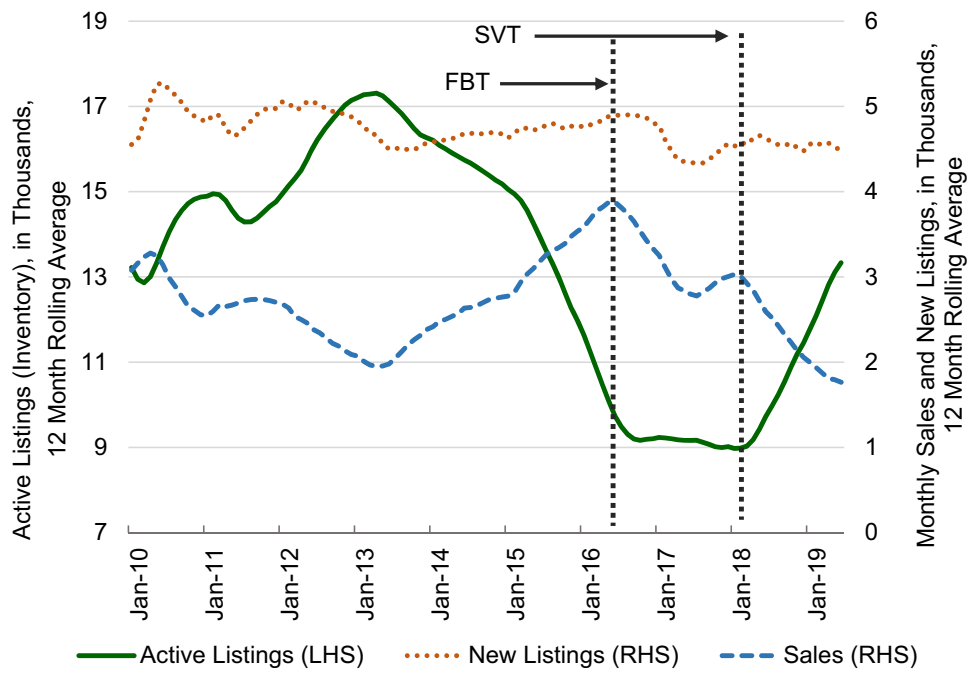
The stark difference in inventory trends illustrated by [Figures 11](#) and [12](#) suggest that speculative expectations were much more resilient in Vancouver. Rather than attempt to list their properties near the top, as did many in Toronto, potential sellers in Vancouver responded to the softer demand conditions by holding off listing. Only after a second wave of policy action, discussed below, did this mindset change.

### Property Surtaxes on Foreign Ownership

The policy proposals for a property surtax on foreign ownership are targeted at the crux of the issue. They seek to impose an extra property tax liability on those who are primarily using foreign wealth or income to purchase real estate, regardless of citizenship status. Two main variants were proposed in British Columbia around the same time, early 2016. One was authored by Jonathan Rhys Kesselman, a professor at Simon Fraser University ([Kesselman 2016](#)). Another, the BC Housing Affordability Fund, was put forward by a group of economists at the University of British Columbia and Simon Fraser University ([BCHAF 2016](#)).

The Kesselman proposal was targeted at higher-end homes (for details, see [Kesselman 2016](#)). A graduated property surtax would apply to the value of a property over \$1 million, on an escalating basis; however, this surtax could be offset with income tax credits from the provincial government equal to the average amount contributed in recent years. In practice, this would mean that the vast majority of local taxpayers would effectively be exempt, but not those who earned abroad. In addition, seniors who had paid consistently into the Canada Pension Plan would earn a complete exemption. Partly because the tax was aimed at higher-end properties, there would be no rental exemption, save the amount of income tax paid by landlords.

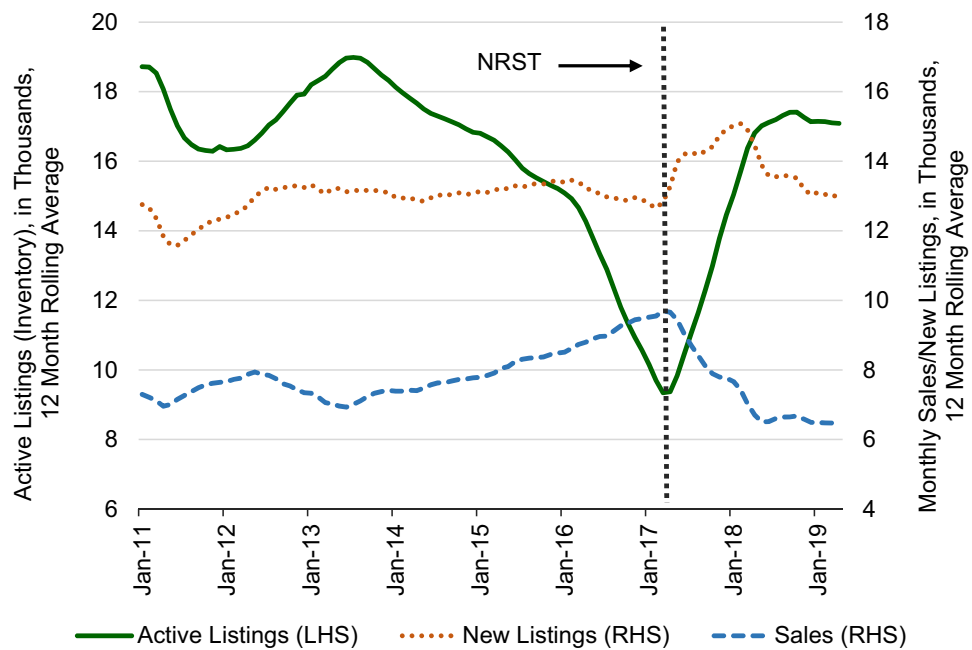
By contrast, the BCHAF proposal set a surtax rate of 1.5 percent on all properties, which could be offset by income tax credits in a manner similar to the Kesselman (2016) proposal (for details, see [BCHAF 2016](#)). Because the tax was aimed at all properties, regardless of value, more exemptions were needed to avoid harming local taxpayers or landlords. Thus, the BCHAF proposed that occupied rental properties would be largely exempt, as long as the rental was not between family members. Also, recipients of Old Age Security or Canada Pension Plan benefits would



**Figure 11:** Greater Vancouver’s Housing Market Trends, 2010–2019

Notes: FBT = Foreign Buyer Tax; LHS = left-hand side; RHS = right-hand side; SVT = Speculation and Vacancy Tax.

Source: Real Estate Board of Greater Vancouver.



**Figure 12:** Greater Toronto’s Housing Market Trends, 2011–2019

Note: LHS = left-hand side; NRST = Non-Resident Speculation Tax; RHS = right-hand side.

Source: Toronto Real Estate Board.

be exempt (i.e., those aged older than 65 years), along with veterans, people with disabilities, and long-time residents, which remained unspecified in the proposal.

Each proposal aimed to discourage the practice of owning property in a jurisdiction without paying income taxes there. Satellite families would be directly targeted by such surtaxes, along with non-resident owners and those who left properties vacant.

These surtaxes had a number of attractive features. First, they would be difficult to evade. Property tax is collected every year—on an immovable asset—and by linking property ownership to income taxes, such a policy framework would expose significant disparities in declared income and expensive property ownership to tax authorities. The practice of buying through proxies, a weakness of foreign buyer taxes noted earlier, would also no longer be as attractive, because those proxies would also have to explain away disparities.

Second, the surtax would apply in a retrospective fashion, unlike foreign buyer taxes. Properties that had been purchased with foreign wealth or income in the past would in many cases be subject to the surtax, which could serve to undercut the existing decoupling that had occurred. It might also generate an instant inventory response, because some of those who owned on the basis of foreign income or wealth sought to sell their properties. This could alleviate tight inventory conditions in a housing crisis.

Third, given the scale of foreign ownership that had built up over decades, these taxes might generate substantial revenues, far exceeding those of foreign buyer taxes. Fourth, by taxing and discouraging foreign ownership in a continuous and comprehensive way, these surtaxes might powerfully alter market expectations: the notion that urban areas would be subject to endless flows of unmitigated foreign wealth into real estate would be undermined, and local buyers would not fear being left out in the same way as before (e.g., the fear of missing out). This might sharply discourage speculative behavior and panicked, risky buying, thereby reducing certain unsustainable forms of housing demand.

When the BC government began to contemplate introducing such a tax, it faced many potential design permutations. The end product of these deliberations was the SVT, which was passed in November 2019 by the BC New Democratic Party, with the support of the BC Green Party (see [Gordon 2019](#)). The SVT applies only to properties in the major urban areas: Metro Vancouver, the Fraser Valley, Victoria, Nanaimo, and Kelowna. Under the SVT, British Columbians who leave a property vacant for more than six months in a year are subject to a 0.5 percent annual tax, but primary residences are exempt from the tax. This vacancy component of the tax is mitigated, though, by a non-refundable tax credit for the first \$400,000 in value (i.e., \$2,000), and various exemptions are provided in the

case of medical treatment or marital breakdown and if the vacant property is used for work-related purposes. Other Canadians with vacant properties are subject to the same tax rate, but they are not eligible for the tax credit or, typically, the kinds of exemptions listed earlier.

Most relevant here is the treatment of foreign owners and satellite families. Properties owned by satellite families and non-permanent residents or citizens are subject to a 2 percent annual property surtax. Satellite families are defined in the legislation as households in which more than half of the income is earned abroad. The only way such owners can escape the tax is if the property, or a portion thereof, is rented out to a long-term, “arms-length” tenant (i.e., not a family member or close acquaintance). This means that satellite families and foreign owners are potentially liable for substantial amounts of tax. For instance, a property worth \$2 million would be assessed a \$40,000 surtax each year.

Central to the administration and enforcement of this portion of the SVT is a brief annual declaration that ties income tax information and other data to property ownership. It allows authorities to notice major disparities in declared income and property values (and compare them with past tax filings, to distinguish house-rich, income-poor seniors). With this information, cases in which satellite families do not truthfully declare their global income can be revealed and then investigated, with steep penalties for dishonest reporting.

Many of the other details of the tax cannot be discussed at length here because of space constraints.<sup>15</sup> Three features of the tax merit comment, though. First, the tax allows for a rental exemption when satellite families rent a portion of their property (e.g., a secondary suite in a detached house). This exemption undermines the overall ambition of curtailing foreign ownership, because it merely encourages satellite families and foreign owners to become landlords, rather than divest or pay a requisite share of taxes. The rationale behind the exemption was likely a desire to not cause undue market turbulence, which might create political problems for the government. If satellite families were pressed immediately, en masse, to divest, then the market might experience a sharp fall, because thousands of properties might be listed for sale in short order. Moving forward, that exemption should be phased out to make the tax more effective.

Second, the declaration and audit system requires diligent enforcement on the part of the government. For many satellite families and foreign owners, there may be tens, even hundreds, of thousands of dollars on the line every year. The incentive to misreport will be strong. A rigorous, and widely publicized, enforcement regime is therefore needed, even with the penalties for dishonest reporting that currently exist. The system, as it is set up, will likely also have a difficult time taxing properties listed in the name of children who receive foreign-sourced gifts



to help purchase their housing. The declaration form asks property owners whether a majority of household income is earned abroad, but children of a certain age may be able to claim that they are a separate household, even if the money is arriving through a satellite family dynamic.

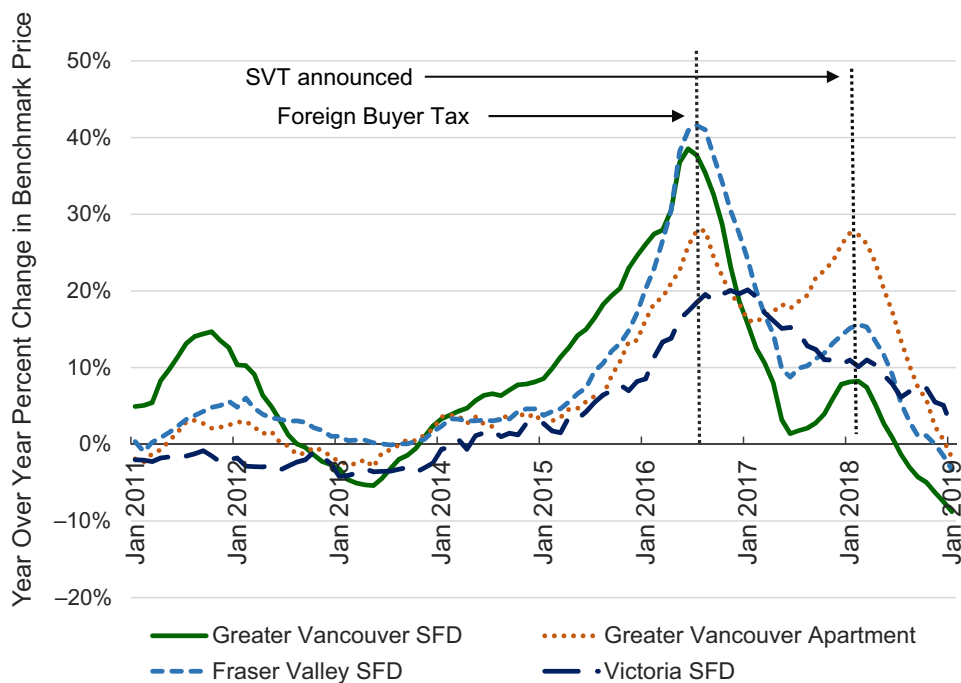
Last, there is the question of the tax rate. Many satellite families may still consider a 2 percent annual tax rate a feasible price to pay because it is less onerous than what they would be paying in income taxes if the global income were declared for tax purposes in Canada. In short, the financial advantage that foreign-sourced buyers have, as described in the introduction, will persist—it will simply be substantially mitigated. It is also true, though, that urban British Columbia will become much less attractive to those seeking to establish a satellite family dynamic relative to other possible housing markets. The government will be able to adjust this rate in the future should it desire a greater impact.

Despite these concerns, the simple announcement of the tax had a significant impact on the housing market in Metro Vancouver, and the other urban regions have begun to see market conditions change, too. This is illustrated in Figure 13 and was foreshadowed in Figures 9 and 11. Sales slowed sharply in 2018 and 2019, such that inventory began to grow steadily, and prices began to fall across the market. By July 2019, the composite house price was down around 7 percent from February 2018 in the Metro Vancouver region and had fallen 12 percent in the detached market. Other factors have contributed

to the slowdown in the market, including federal “stress test” mortgage regulations and tighter restrictions on capital flight in China, but the sharp turnaround in the condo market coincides closely with the announcement of the tax, given that it shifted speculative expectations. Moreover, as the Metro Vancouver market has cooled, so too have the spillover markets in British Columbia, as the ripple effect theory would suggest (Figure 13). Last, the pattern of price decline across municipalities strongly reinforces the analysis offered in the “Foreign Ownership and Decoupling” section: the municipalities with the highest proportion of non-resident ownership have seen the steepest declines in detached house prices since the announcement of the tax. This is depicted in Figure 14.

## Conclusion

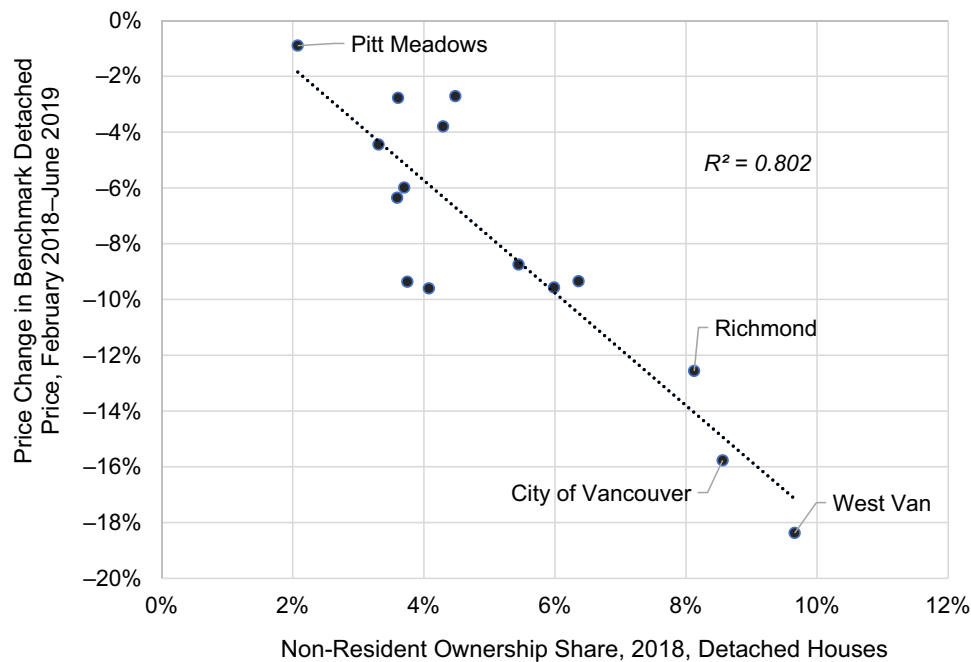
Housing affordability has been among the most prominent issues in Canadian politics in recent years. Yet intense housing affordability challenges do not exist in most urban regions. Those challenges are principally found in Toronto and Vancouver and the smaller urban regions that surround them. Addressing this situation requires targeted policy that takes aim at the central factors in rising house prices in these cities. The policies discussed in this article constitute plausible candidates to address one important factor in unaffordability, foreign ownership. Moreover, as has been shown, there are already indications of initial success.



**Figure 13:** Ripple Effect in British Columbia, 2011–2019

Notes: SFD = single-family detached; SVT = Speculation and Vacancy Tax.

Source: Canadian Real Estate Association/Teranet.



**Figure 14:** Price Change in Detached Market versus Non-Resident Ownership Share, 2018–2019

Sources: Real Estate Board of Greater Vancouver; Fraser Valley Real Estate Board; Canada Housing Statistics Program.

Foreign buyer taxes and property surtaxes on foreign ownership are important mechanisms to deliver improved affordability in these metropolitan regions. In their absence, housing markets will remain vulnerable to destabilizing housing bubbles generated by a rapid influx of foreign investment, and much of the valuable property in these cities will gradually come to be owned by those who earn their income or accumulate their wealth abroad. As made clear in the introduction, the existing taxation system, with the existing constraints on Canada Revenue Agency enforcement, has meant that local taxpayers can face a substantial disadvantage when competing with buyers using foreign income or wealth generated in low-tax jurisdictions. The status quo invites or encourages a form of free-riding behavior by wealthy families, as experience with the IIP has shown, in which many of those who purchase real estate with foreign wealth do not typically participate in the local labour market or pay income tax on their global income. As cities with substantial public amenities and social services, Toronto and Vancouver, as well as other major cities in Canada, will always be attractive targets for such satellite family arrangements. Moreover, in attractive, growing cities, the dynamic of induced demand will constrain what can be achieved by reforms on the supply side (Aura and Davidoff 2008). Limiting foreign ownership through a revamping of the tax system—and thus alleviating the decoupling of the housing and labour markets—is therefore essential.

The policy measures discussed here have polled well in recent years, receiving around 80 percent support in

Toronto and Vancouver (Angus Reid 2018). This suggests a public receptivity to such policies should governments desire to take action. It also suggests some scope for governments to explore variations on the existing policy measures. The policies discussed in this article do not exhaust the possible policy measures that could be taken to address foreign ownership, and the existing measures could be made more stringent, in ways that are suggested in the preceding two sections. Other measures, such as proposals to ban foreign buying, have not been explored here for reasons of space. Nevertheless, the evaluation of the existing measures provided in this article can inform an analysis of the expected effects of similarly intentioned policies. The experiences of British Columbia and Ontario with their policy measures will also provide fertile opportunities for policy learning. In particular, British Columbia's SVT has provided a template that other governments can now work from. The BC experience will provide guidance to policy-makers moving forward, illustrating the relative effectiveness—and political risks—of such an approach.

### Acknowledgments

I thank David Ley, Andy Yan, and two anonymous reviewers for their helpful feedback. Any errors or omissions are the responsibility of the author alone.

### Notes

- 1 The academic work on this topic is limited. One academic article that addresses the issue of tax residency in Canada is

- Lefebvre (2006); however, it does not explicitly address tax treaties and their implications. A summary of the relevant considerations in establishing tax residency can be found in Canada (n.d.) or, in less technical form, in Fennell (2018). As is made clear in Young (2016c) and Tomlinson (2015), these issues are widely recognized, and have been for some time. In the next section, I present clear evidence of a significant discrepancy between income declared for Canadian taxation and the housing purchases made by wealthy migrants, which indicates widespread avoidance of Canadian taxation among this group.
- 2 In what follows, Toronto and Vancouver are used to refer to the census metropolitan areas (CMAs), unless otherwise specified.
  - 3 In terms of supply constraints, only surveys of developers exist, which is not a reliable way of estimating them. See Green et al. (2016).
  - 4 This is a central weakness of the recent CMHC (2018) analysis. The CMHC performed longitudinal regressions on particular cities – without a cross-sectional component – and used a lagged dependent variable format. This approach would greatly exaggerate the explanatory power of the three independent variables CMHC chose to include (mortgage rates, household formation, and income growth).
  - 5 The CHSP represents a housing census for the areas so far included (British Columbia, Ontario, and Nova Scotia). For details, see Statistics Canada (2018a).
  - 6 See, for example, the housing affordability measure developed by the RBC (2018). The RBC measure correlates with the price-to-income ratio in Figure 1 at around  $r = 0.98$ .
  - 7 See the “Focus on Geography Series” for the 2016 Census. These data are available at Statistics Canada (2018b).
  - 8 For such speculative arrangements, see, for example, Tomlinson (2016). This issue is also discussed in Tomlinson (2015).
  - 9 It is possible to choose two different kinds of income statistics for this denominator: (a) whether one takes the median income of all households or the median income of only owner households and (b) whether one takes the median figure of all owner households or only of those who own a detached house. Each potential confounder in the price-to-income ratio – for example, a high share of renters or a low share of detached houses – may be controlled for by looking at the median income of owners of detached houses. Before late 2019, however, this analysis was not possible on the basis of publicly available data. Another approach, which is adopted in Appendix A, is to control for these confounding factors in regression analysis. Subsequent to the acceptance of this article, in December 2019, CHSP data were released that allow researchers to look directly at the median incomes of owners of detached houses while also controlling for owners who are drawing a pension. These new data only reinforce the conclusions of Appendix A, which is that the relationships depicted in Figures 4 and 6 are robust to controls for various confounders. This analysis is presented in recent work (Gordon 2020). The downside of adopting an approach that looks only at the incomes of those who already own detached houses, though, is that it gives a misleading (or understated) indication of how out of reach detached house prices are from typical household incomes.
  - 10 In fact, when various confounders are controlled for more directly, the relationship strengthens in Figure 4. See Note 9.
  - 11 It is debatable that in the Cities of Vancouver and North Vancouver, there might be some expectation of rezoning in coming years that will increase the price of detached houses, but in the other suburban areas this is much less likely. This suggests that varied municipal policy around supply could not explain the divergence in ratios.
  - 12 Consider a housing market with 10,000 houses. If there is a 3 percent non-resident ownership share in 2012 and a 5 percent ownership share in 2017, then that will entail the purchase of 200 houses over that five-year period (or 40 per year). If there are only 200 houses bought and sold every year, though, then those 200 purchases will represent 20 percent of all sales, which is likely to move a market (i.e.,  $40/200 = 0.2$ ).
  - 13 This motivated the BC government to raise the tax rate to 20 percent in February 2018 and to expand its application to other urban areas in the province.
  - 14 Real estate industry representatives at the time used these low inventory levels to claim, misleadingly, that the problem was weak built supply, but supply in the sense of active listings is not closely associated with building patterns. As noted earlier, there had been no sudden drop off in construction activity in Toronto before the price spike of 2015–2017. Rather than illustrating unique problems in the realm of built supply, then, the low inventory was the product of a sudden demand surge.
  - 15 The interested reader can read the details of the legislation in British Columbia (2018). A less technical summary is found in KPMG (2018).
  - 16 The City of Vancouver and the City of Toronto were assigned a figure of 10 minutes, to add realism. Changing their commute time to zero did not materially change the results.

## References

- Aura, S., and T. Davidoff. 2008. “Supply Constraints and Housing Prices.” *Economics Letters* 99(2):275–77.
- British Columbia. 2018. *Bill 45 – 2018: Budget Measures Implementation (Speculation and Vacancy Tax) Act, 2018*. Bill 45, 3rd Sess, 41st Parliament, British Columbia. At <https://www.leg.bc.ca/parliamentary-business/legislation-debates-proceedings/41st-parliament/3rd-session/bills/first-reading/gov45-1>.
- British Columbia Housing Authority Fund (BCHAF). 2016. “B.C. Housing Affordability Fund.” At [http://www.housingaffordability.org/uploads/7/0/1/8/70187537/bchaf\\_proposal.pdf](http://www.housingaffordability.org/uploads/7/0/1/8/70187537/bchaf_proposal.pdf).
- Canada. n.d. “Income Tax Folio S5-F1-C1, Determining an Individual’s Residence Status.” At <https://www.canada.ca/en/revenue-agency/services/tax/international-non-residents/information-been-moved/determining-your-residency-status.html>.
- Canada Mortgage and Housing Corporation (CMHC). 2018. “Examining Escalating House Prices in Large Canadian Metropolitan Centres.” At <https://www.cmhc-schl.gc.ca/en/data-and-research/publications-and-reports/examining-escalating-house-prices-in-large-canadian-metropolitan-centres>.
- Canada Mortgage and Housing Corporation (CMHC). 2019. “Housing Market Information Portal.” At <https://www03.cmhc-schl.gc.ca/hmip-pimh/en#Profile/1/1/Canada>.

- Caranci, B., D. Petramala, and K. Judge. 2017. "Toronto Housing: The Heat Is On, Buyers Caught Up in the Action." *TD Economics*, 20 March. At [https://www.td.com/document/PDF/economics/special/GTAHousing\\_Mar2017.pdf](https://www.td.com/document/PDF/economics/special/GTAHousing_Mar2017.pdf).
- Chinco, A., and C. Mayer. 2015. "Misinformed Speculators and Mispricing in the Housing Market." *Review of Financial Studies* 29(2):486–522.
- Citizenship and Immigration Canada. 2014. "Evaluation of the Federal Business Immigration Program." At [https://www.canada.ca/content/dam/ircc/migration/ircc/english/pdf/pub/e2-2013\\_fbip.pdf](https://www.canada.ca/content/dam/ircc/migration/ircc/english/pdf/pub/e2-2013_fbip.pdf).
- Coriolis. 2014. *CAC Policy and Housing Affordability: Review for the City of Vancouver*. Vancouver: Coriolis Consulting Group.
- Davidoff, T. 2013. "Supply Elasticity and the Housing Cycle in the 2000s." *Real Estate Economics* 41(4):793–813. <https://doi.org/10.1111/1540-6229.12019>.
- Davidoff, T. 2016. "Supply Constraints Are Not Valid Instrumental Variables for Home Prices Because They Are Correlated with Many Demand Factors." *Critical Finance Review* 5(2):177–206. <https://doi.org/10.2139/ssrn.2400833>.
- Fennell, A. 2018. "Determining Your Tax Residency Status in Canada." Vancouver: Royal Bank of Canada; Wealth Management. At [https://ca.rbcwealthmanagement.com/documents/1435520/1435536/Determining\\_your\\_tax\\_residency\\_status\\_in\\_Canada\\_05172018\\_email.pdf/9ff73a9f-af5c-4cb4-8860-070050ac23e0](https://ca.rbcwealthmanagement.com/documents/1435520/1435536/Determining_your_tax_residency_status_in_Canada_05172018_email.pdf/9ff73a9f-af5c-4cb4-8860-070050ac23e0).
- Gellatly, G., and R. Morissette. 2019. *Immigrant Ownership of Residential Properties in Toronto and Vancouver*. Ottawa: Statistics Canada.
- Gordon, J. 2016. *Vancouver's Housing Affordability Crisis: Causes, Consequences and Solutions*. Vancouver: Simon Fraser University School of Public Policy, Center for Public Policy Research.
- Gordon, J. 2017a. *In High Demand: Addressing the Demand Factors behind Toronto's Housing Affordability Problem*. Toronto: Ryerson City Building Institute.
- Gordon, J. 2017b. "The Ethical Case for Taxing Foreign Buyers." *The Globe and Mail*, 12 April.
- Gordon, J. 2019. *The Speculation and Vacancy Tax: An Explainer*. Vancouver, BC: Simon Fraser University School of Public Policy, Center for Public Policy Research.
- Gordon, J. 2020. *Solving Wozny's Puzzle (2): Foreign ownership, tax avoidance, and Vancouver's Decoupled Housing Market*. Vancouver: Simon Fraser University School of Public Policy, Center for Public Policy Research.
- Green, K., J. Filipowicz, S. Lafleur, and I. Herzog. 2016. *The Impact of Land-Use Regulation on Housing Supply in Canada*. Vancouver: Fraser Institute.
- Grigoryeva, I., and D. Ley. 2019. "The Price Ripple Effect in the Vancouver Housing Market." *Urban Geography* 40(8):1168–90. <https://doi.org/10.1080/02723638.2019.1567202>.
- Hager, M., and K. Tomlinson. 2016. "Seizures of Undeclared Cash Spike at Vancouver International Airport." *The Globe and Mail*, 9 September.
- Kesselman, J.R. 2016. "Attacking High Housing Prices by Making Property Tax Progressive." Intelligence Memo, C.D. Howe Institute, Toronto.
- Klein, M. 2017. "Chinese Capital Flight is Back." *Financial Times* (Alphaville), 18 January.
- KPMG. 2018. "B.C. Releases Draft Legislation for Speculation Tax." *TaxNewsFlash Canada*, 23 October. At <https://assets.kpmg/content/dam/kpmg/ca/pdf/tnf/2018/ca-bc-releases-draft-legislation-for-speculation-tax.pdf>.
- Lefebvre, P. 2006. "Canada's Jurisdiction to Tax: Residency and the Thomson Decision 60 Years Later." *Canadian Tax Journal* 54(3):762–80.
- Ley, D. 2010. *Millionaire Migrants: Trans-Pacific Life Lines*. Malden, MA: Wiley-Blackwell.
- Ley, D. 2017. "Global China and the Making of Vancouver's Residential Property Market." *International Journal of Housing Policy* 17(1):15–34.
- Marlow, I. 2014. "Vancouver Housing Data Reveals China Connection." *The Globe and Mail*, 22 August.
- Moos, M., and A. Skaburskis. 2010. "The Globalization of Urban Housing Markets: Immigration and Changing Housing Demand in Vancouver." *Urban Geography* 31(6):724–49.
- Pasalis, J. 2017. *Freeholds on Fire: How Investor Demand Is Driving Up Toronto Area Housing Prices*. Toronto: Realosophy.
- Reid, A. 2018. "Banking on a Burst Bubble." At <http://angusreid.org/metro-vancouver-housing-prices-policy/>.
- Royal Bank of Canada (RBC). 2018. "Housing Trends and Affordability." Toronto: Royal Bank of Canada.
- Saiz, A. 2010. "The Geographic Determinants of Housing Supply." *Quarterly Journal of Economics* 125(3):1253–95. <https://doi.org/10.1162/qjec.2010.125.3.1253>.
- Schell, O. 2016. "Crackdown in China: Worse and Worse." *The New York Review of Books*, 21 April.
- Statistics Canada. 2018a. "Canada Housing Statistics Program (CHSP)." At <http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5257>.
- Statistics Canada. 2018b. "Focus on Geography Series, 2016 Census." At <https://www12.statcan.gc.ca/census-recensement/2016/as-sa/fogs-spg/Index-eng.cfm>.
- Tomlinson, K. 2015. "Foreign Investors Avoid Taxes through Canadian Real Estate." *The Globe and Mail*, 6 October.
- Tomlinson, K. 2016. "Out of the Shadows." *The Globe and Mail*, 10 September.
- Urban Development Institute (UDI). 2014. *State of the Market Report: Q3 2014*. Vancouver: UDI.
- Urban Development Institute (UDI). 2017. *State of the Market Report: Q4 2017*. Vancouver: UDI.
- Wozny, R. 2017. *Low Incomes and High Housing Prices*. Vancouver: Site Economics.
- Yan, A. 2015. "Ownership Patterns of Single Family Homes Sales on the West Side Neighborhoods of the City of Vancouver: A Case Study." Vancouver: Bing Thom Architects. At <https://www.slideshare.net/ayan604/ownership-patterns-of-single-family-homes-sales-on-the-west-side-neighborhoods-of-the-city-of-vancouver-a-case-study>.
- Young, I. 2016a. "Leak Reveals Secret Crackdown on Foreign-Money Real Estate Deals in Vancouver." *South China Morning Post*, 14 July.
- Young, I. 2016b. "Canada's Tax Agency Is 'Out for Blood': Not from Global Income Cheats, but from Its Leaking Auditors." *South China Morning Post*, 25 August.
- Young, I. 2016c. "Tax Officials Ignored Auditors' Warnings about Foreign Money in Vancouver Housing Market 20 Years ago, Leaked Documents Show." *South China Morning Post*, 30 August.



## Appendix A: Investigating Decoupling in Toronto and Vancouver

In this appendix, I investigate whether the strong bivariate correlation between decoupling and non-resident ownership presented in the “Foreign Ownership and Decoupling in the Detached Housing Markets of Toronto and Vancouver” section is robust to the inclusion of a few possible confounding factors. I do so through a cross-sectional regression analysis of house price decoupling in Vancouver and Toronto (census metropolitan areas, or CMAs).

In forthcoming work, using new CHSP data, I control for these confounders directly by looking only at the incomes of owners of single detached properties who are not drawing a pension. The conclusions arrived at in this Appendix do not change with this alternate approach; in fact, they simply reinforce the analysis here, which is that the relationship of foreign ownership to decoupling is very strong and robust to the inclusion of various confounding variables. This work is discussed in Note 9.

The dependent variable in this section is the house-price-to-income ratio in various municipalities across these CMAs. This was measured by taking the median assessed value of detached houses in a municipality, as found in the Canada Housing Statistics Program (CHSP; Table 46-10-0022-01), and dividing it by the median household income of those who own residential property in these municipalities. The latter figure is a custom tabulation from Census 2016 data (Table 98-400-X2016225). The products of these calculations are [Figures 3](#) and [5](#), using 2017 and 2016 assessed values, respectively (which correspond to what is available in the CHSP).

This dependent variable is one of several possible average price-to-income metrics. There are three main ways the dependent variable might change: (a) by taking real estate board figures for benchmark prices instead of assessed values, (b) by looking at types of properties other than detached houses, and (c) by choosing a different average income statistic (e.g., using a mean figure rather than a median, looking at all households in a municipality and not just owners, or looking solely at the incomes of those who own detached houses). Using real estate board figures produces ratios that are very similar to those found in [Figures 3](#) and [5](#) (e.g., a correlation of approximately 0.97). Similarly, using different income figures does not substantially change the relative position of municipalities either, and thus the results presented here are robust to these possible permutations. This is partly because most of the variation in the ratio is driven by house prices rather than incomes (e.g., in Metro Vancouver, the median household income of the highest municipality was only 57 percent higher than the lowest, whereas the highest median assessed value was 375 percent higher than the

lowest). A median income figure was used because this is consistent with common practice in this field (see the measures cited in [Ley 2017](#)). Last, looking at other types of properties was not conducted, for the reasons spelled out in the “Foreign Ownership and Decoupling” section: there are a range of additional confounders or variables that might need to be included, which are not currently available to me. This is therefore a topic for future research.

The puzzle presented by [Figures 3](#) and [5](#) is this: why have detached housing prices become more decoupled from local incomes in some municipalities than in others? In some municipalities, prices are much higher than local incomes seem to justify, given current mortgage rules and practices, whereas in others they are more in line with them.

There are a few possible explanations for this divergence in decoupling. The first, discussed in the “Foreign Ownership and Decoupling” section, is the relative presence of foreign ownership, as proxied by non-resident ownership. This is the primary independent variable in the analysis that follows. For the theoretical reasons set out in this section, one would expect that higher rates of foreign ownership will generate a higher degree of decoupling (e.g., [Ley 2010](#); [Moos and Skaburskis 2010](#)).

Another source of divergence might be distance from the central business district (CBD). Because longer commutes are typically a source of disutility, residents might trade income (i.e., higher house prices) for shorter commutes. One might expect, then, that municipalities closer to the CBD would have higher house price-to-income ratios. This is measured by looking at an average commute time between downtown Vancouver or downtown Toronto and the municipality in question according to Google trip planner (at 1:30 p.m. and 5:00 p.m. on a weekday).<sup>16</sup> A third source of divergence might be the composition of the housing stock (Table 46-10-0029-01) because that would affect the average income statistic: municipalities with higher shares of single-detached housing will have relatively higher average incomes, all else equal, because single-family detached housing is more expensive than other forms of housing.

[Figures 3](#) and [5](#) already control for one possible confounder in relation to the average income statistic by looking only at the incomes of residential property owners. (Municipalities with a high relative share of renters might have a higher price-to-income ratio, because the average incomes of renters are usually well below those of owners, and thus a high renter share would depress the denominator figure.)

Last, the analysis here also includes a variable that measures the share of the municipal population that is older than age 65 years ([Statistics Canada 2018b](#)). Elderly (or retired) households will often have purchasing power that is greater than their declared incomes suggest because

their buying power will to a greater extent be premised on accumulated wealth. One might expect, then, that areas with a higher share of elderly households will have higher price-to-income ratios because the average income statistic will understate past or current purchasing power, or both.

Table A.1 displays the descriptive statistics for each of these possible independent variables. Factors relating to supply constraints are not included in the analysis because the supply of single-detached housing is inelastic in most of the municipalities investigated here. (There are a few municipalities in the Toronto CMA where this is arguably not the case, and this is a matter for future analysis.) Mortgage rules and interest rates are assumed to be constant across these CMAs. One final source of possible divergence is the desirability of each municipality, or its amenities: households might trade income for amenity, generating higher price-to-income ratios. A variable of this sort is not included for two reasons. First, this would be very difficult to plausibly (or uncontroversially) measure. Second, this is assumed to be reflected in the average homeowner income statistic: higher-earning households will typically purchase in more desirable areas because they will be able to out-compete lower-earning households for this housing. Controlling for the composition of the housing stock, as is done here, should address this dynamic.

Tables A.2 and A.3 present the results of a basic ordinary least squares regression analysis, adding each of the relevant independent variables in a stepwise fashion. The analysis shows that in each regression model, non-resident ownership is statistically significant ( $\alpha = 0.001$ ), predicting a higher price-to-income ratio in a municipality. The coefficient is substantively large: in Metro Vancouver, a 1 percent share increase in non-resident ownership is predicted to result in a 1.87 point increase in the detached price-to-income ratio (e.g., moving from the non-resident share of Langley [3.3], the third lowest municipality, to Richmond [8.1], the third highest, is predicted to increase the ratio by roughly 9). In Metro Vancouver, the other

**Table A.1:** Descriptive Statistics

Municipalities	Mean (SD)
<b>Toronto</b>	
Share non-resident	2.05 (0.83)
Distance from CBD (minutes)	66.24 (17.84)
Share detached	69.13 (11.31)
Share over 65	14.25 (2.22)
Price to income	6.59 (2.00)
<b>Vancouver</b>	
Share non-resident	4.95 (2.16)
Distance from CBD (minutes)	42.59 (15.40)
Share detached	38.23 (14.18)
Share older than age 65 years	17.42 (5.51)
Price to income ratio	14.78 (6.18)

Note: CBD = Central Business District.

variables are statistically significant in the final model, which includes all three other independent variables. In Toronto, the other variables are not, except commute time in the second model. The  $R^2$  of these regressions is also high, especially in the case of Metro Vancouver. These results reinforce the striking bivariate relationship found in Figures 4 and 6. Foreign ownership, as proxied by non-resident ownership, appears to have played a major role in the decoupling of detached housing prices from local incomes in Toronto and Vancouver.

**Table A.2:** Regression Analysis of Decoupling in Vancouver (CMA), 2016–2017

Regression	(1) priceto income	(2) priceto income	(3) priceto income	(4) priceto income
sharenonresident	2.697*** (0.244)	2.311*** (0.292)	2.354*** (0.273)	1.866*** (0.259)
distancefromcbd		-0.0837 (0.0410)	-0.0729 (0.0386)	-0.127** (0.0342)
sharedetached			-0.0567 (0.0319)	-0.0614* (0.0245)
shareover65				0.249** (0.0780)
_cons	1.434 (1.314)	6.912* (2.936)	8.406* (2.859)	8.989** (2.198)
N	17	17	17	17
R <sup>2</sup>	0.890	0.915	0.932	0.963

Notes: Standard errors in parentheses. CMA = census metropolitan area.

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

**Table A.3:** Regression Analysis of Decoupling in Toronto (CMA), 2016

Regression	(1) priceto income	(2) priceto income	(3) priceto income	(4) priceto income
sharenonresident	1.961*** (0.304)	1.647*** (0.259)	1.623*** (0.269)	1.565*** (0.278)
distancefromcbd		-0.0431** (0.0121)	-0.0363 (0.0188)	-0.0386 (0.0190)
sharedetached			-0.0144 (0.0301)	-0.0168 (0.0303)
shareover65				0.0890 (0.0990)
_cons	2.573*** (0.670)	6.073*** (1.118)	6.670*** (1.687)	5.838** (1.932)
N	23	23	23	23
R <sup>2</sup>	0.664	0.795	0.797	0.806

Notes: Standard errors in parentheses. CMA = census metropolitan area.

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .