

## SHOULD ALBERTA ADOPT A LAND TRANSFER TAX?

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### SUMMARY

Alberta does not have a land transfer tax on the sale of real property, nor should the province contemplate bringing one in. Instead, if the Alberta government seeks new tax revenue, it should institute a sales tax or raise property taxes.

This paper examines previous research on land transfer taxes in Canada, Australia and Europe, and concludes that such a tax would only add its own volatility to that inherent to Alberta's resource revenue-based economy. Calculations show that a one-per-cent land transfer tax in Alberta would have yielded between \$460 million and \$500 million for provincial coffers in 2017. However appealing that amount of revenue sounds, the tax's benefits do not outweigh its drawbacks.

Land transfer values in Alberta can undergo substantial changes from one year to the next, making a land transfer tax a highly precarious revenue source. Given the already volatile fluctuations in Alberta's fiscal situation due to its boom-and-bust economy, the volatile nature of a land transfer tax would be thrown into the mix, thus compounding the difficulty of making budget decisions.

Nor would a land transfer tax benefit Albertans who are in the market for a home. Studies show that such taxes discourage residential real estate transactions because of the burden of the added fees involved. They also impose a larger welfare loss per dollar of tax revenue than do residential property taxes. Further, while placing a larger financial burden on real estate transactions, the revenue generated by land transfer taxes does not displace or exceed the revenue that property taxes bring in.

If land transfer taxes are burdensome for homebuyers, they are equally so for sellers who may be compelled to lower their asking prices to make up for the extra costs the tax imposes. This leads to a drop in fair market value of homes with a negative impact on the volume and value of real estate transactions.

While a land transfer tax could potentially raise a significant amount of revenue for the Alberta government it still would be insufficient to cover the province's current fiscal deficit. The situation would be made worse by a negative spin-off effect for the economy due to the reduction of transactions, and a slippage in tax revenues because of declines in the value and volume of land transfers. This paper estimates those declines to be between five and 15 per cent, based on a land transfer tax rate

of three per cent, which should be the highest rate if the Alberta government ever considers creating such a tax. Meanwhile, the land transfer tax would exact a relatively high tax payment from middle-income families – as high as seven per cent of median household income in Calgary and Edmonton – which could add a substantial amount to the mortgage debt for these families.

Real estate transactions in Alberta are currently subject to a land titles fee, with property taxes being the standard for raising revenue from homeowners. This system should not be revamped in favour of a land transfer tax, as such a move would only be to the detriment of the provincial economy and to individual Albertans.

## 1. INTRODUCTION

Given the province's current and projected fiscal deficits, the Alberta government may want to consider tapping into new sources of tax revenue.<sup>1</sup> One tax that is not levied in Alberta, and which is generating substantial amounts of revenue in other provinces, is a land transfer tax.<sup>2</sup> For example, land transfer taxes generated \$2.7 billion for the Ontario government and \$2 billion for the government of British Columbia in 2017. Given the revenues that a land transfer tax generates in these provinces, it would be natural for any Alberta finance minister to wonder whether adopting a land transfer tax might be part of the solution to Alberta's deficit problem. We do not know whether the provincial government is actively considering such a tax. Nonetheless, we feel that it is interesting to consider whether Alberta should adopt it. If at some point in the future a political party or a provincial government proposes a land transfer tax, this paper will provide background information that the public can use to assess the merits and consequences of introducing this tax.

The paper is organized as follows. Section 2 surveys the rates and revenues generated by land transfer taxes in Canadian municipalities and provinces, especially in British Columbia, as well as in Australian state governments. In broad terms, we find that provincial land transfer taxes can raise significant amounts of revenues, but they have not displaced or exceeded revenues that provincial property taxes generate. Land transfer taxes are also very volatile sources of tax revenue that increase rapidly during housing market booms, but then decline sharply when housing markets crash.

In Section 3, we review the econometric studies of the impact of land transfer taxes on housing prices and sales volumes with the view to answering three basic questions. They are: Who bears the burden of a land transfer tax? Does the tax discourage or distort economic activity? Is the tax fair? With regard to the first question, the empirical evidence based on the experiences in different countries is somewhat mixed, but most studies indicate that current homeowners bear a substantial share of the burden through reductions in housing sales prices. With regard to the second question, the evidence is again mixed, but many studies find that land transfer taxes significantly reduce the volume of residential real estate transactions. The economic losses from reductions in housing market transactions are real – some families do not move to properties that are more suited to their needs – implying a loss of well-being that can exceed the land transfer tax revenue collected. As for fairness, a land transfer tax has the same incidence as an annual property tax to the extent that it is capitalized in the value of property at the time it is levied. If it is only partially shifted from buyers to owners, a land transfer tax will tend to fall more heavily on households that move more frequently, potentially imposing a larger burden on younger generations. The authors of many of the studies that we review conclude that residential property tax is a better source of revenue than a land transfer tax because it causes few distortions in the housing market.

In Section 4, we estimate that a one-per-cent land transfer tax in Alberta would have yielded about \$500 million in 2017 in the absence of any impact on the value or volume of real estate transactions. However, this is likely an over-estimation of the revenue potential once reductions in the volume and value of real estate transactions are taken into account. Based on the impact

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<sup>1</sup> A detailed analysis of the fiscal options for dealing with Alberta's deficit is beyond the scope of this paper. See research papers on fiscal issues and reform options at The School of Public Policy's Alberta's Fiscal Future project, <https://www.policyschool.ca/albertas-fiscal-future/>.

<sup>2</sup> We will use the term "land transfer tax" to refer to taxes that are levied when real property is transferred from one owner to another. In some jurisdictions, such as Australia and the U.K., these taxes are known as stamp duties.

of the land transfer tax in Toronto in a study by Dachis et al., (2012a), a one-per-cent land transfer tax could reduce the value of a typical transaction by the amount of the tax, i.e., by one per cent, and the volume of transactions might fall by seven per cent. Using these rough estimates of the tax's impact on the volume and value of real estate transactions, the projected revenue would be eight per cent lower or about \$460 million. While this is still a substantial amount of revenue, it is equivalent to less than three per cent of the Alberta government's total tax revenues, or about 20 per cent of the education property tax revenues.

Data on the value of land transfers in Alberta also indicate that, as in other jurisdictions, their value can vary substantially from year to year. A land transfer tax in Alberta would be a highly volatile source of tax revenue and highly correlated with fluctuations in the province's non-renewable resource revenues. A land transfer tax would likely exacerbate the volatility of total provincial revenues, making budgeting and fiscal decisions even more difficult than currently. Finally, we show that a one-per cent land transfer tax on an average land transfer in 2015 would represent six- to seven per cent of median household income in Edmonton and Calgary. This would be significantly higher than the four- to five per cent land transfer tax burden on the residents of other Alberta cities because housing prices are higher in Alberta's two largest cities.

Section 5 summarizes the key points in our analysis of the impact of a land transfer tax in Alberta. Perhaps not surprisingly in view of the above summary of our findings, we are not in favour of the introduction of a land transfer tax in Alberta.

## **2. LAND TRANSFER TAXES IN CANADA AND AUSTRALIA**

Land transfer taxes are levied in more than 20 developed countries by central, state or municipal governments. In this section, we provide a brief overview of the experience with land transfer taxes by municipal and provincial governments in Canada and state governments in Australia.

The land transfer tax rates imposed by four Canadian cities are shown in Table 1.<sup>3</sup> Halifax has a flat rate of 1.5 per cent of the value of the property, whereas the rates in Toronto, Montreal and Quebec City increase with the property's value. It is important to note, in view of our later review of the studies of provincial land transfer taxes, that these rates are applied to each portion of the sales value, similar to a progressive income tax structure. For example, in Toronto there are four tax rates that range from 0.55 per cent for property sales of \$55,000 or less, rising to 2.5 per cent for sales above \$2 million. On a \$1 million residential property sale, the municipal land transfer tax would be \$16,475, for an average rate of 1.65 per cent. Note that a provincial land transfer tax of \$16,475 would also be levied on this transaction, bringing the total to 3.3 per cent of the sales price.<sup>4</sup>

Table 2 indicates that Toronto's land transfer tax is a relatively important source of revenue for the city, as the tax is equivalent to 17.7 per cent of the city's property tax revenues. While the land transfer tax is equivalent to a higher percentage of property tax in Toronto, it raises significant revenues in the three other Canadian cities listed. Even with a 1.5-per-cent flat rate, Halifax's land transfer tax raises the equivalent revenues of 7.5 per cent of the city's property taxes. Both Montreal's and Quebec City's land transfer taxes raise the equivalent of 5.5 per

<sup>3</sup> This section is drawn from McMillan and Dahlby (2018a).

<sup>4</sup> See <https://www.ratehub.ca/land-transfer-tax-ontario> for calculation of land transfer taxes in Ontario.

cent and 3.6 per cent of property tax revenues. Thus land transfer taxes are significant sources of own-source tax revenues for each city, but in no case has the tax eclipsed the role of the property tax as the main own-source tax.

**TABLE 1 CANADIAN MUNICIPALITIES' LAND TRANSFER TAX RATES**

Municipality	Rates	
	Value of Property	Tax Payable (%)
Halifax	All Property	1.5%
Montreal	< \$50,000	0.5%
	\$50,000 - \$249,999	1.0%
	\$250,000 - \$499,999	1.5%
	\$500,000 - \$999,999	2.0%
	> \$1,000,000	2.5%
Quebec City	< \$50,000	0.5%
	\$50,000 - \$249,999	1.0%
	> \$250,000	1.5%
Toronto	< \$55,000	0.5%
	\$55,000 - \$249,999	1.0%
	\$250,000 - \$399,999	1.5%
	\$400,000 - \$1,999,999	2.0%
	> \$2,000,000	2.5%

Sources: City of Toronto (2018), Nova Scotia (2017), Montreal (2017a) and Ville de Québec (2018a).

**TABLE 2 CANADIAN MUNICIPALITY TAX REVENUES IN 2017**

Municipality	Land Transfer Tax	Property Tax	Total Revenue
Halifax	\$33,000,000	\$442,834,200	\$721,748,700
Montreal	\$152,730,000	\$2,806,485,000	\$3,342,043,000
Quebec City	\$30,500,000	\$850,400,000	\$1,024,800,000
Toronto	\$716,000,000	\$4,046,000,000	\$10,540,000,000

Sources: City of Toronto (2017, 6), Halifax Regional Municipality (2017, B10), Montreal (2017b, 104), Ville de Québec (2018b, 64).

Five provincial governments also raise revenues through land transfer taxes.<sup>5</sup> Table 3 shows the land transfer tax rates that these provincial governments levied in 2017. Of the total revenues that each of these six provinces raised, only British Columbia's, Ontario's and Manitoba's land transfer taxes raised more than two per cent of total annual revenue. British Columbia and Ontario have progressive tax rate schedules on residential property, with the top tax rates of three per cent in British Columbia and 2.5 per cent in Ontario on properties valued at \$2 million or higher. In 2017 British Columbia's and Ontario's land transfer taxes generated \$2.03 billion and \$2.73 billion in revenues respectively. As Figure 1 indicates, the land transfer tax revenues in Ontario and British Columbia steadily increased until 2008 and then declined in both provinces following the financial market crisis. The recovery was more rapid in Ontario

<sup>5</sup> Saskatchewan and Alberta do not levy land transfer taxes, but collect a land titles registration fee that is payable at the time of purchase of a property.

than in British Columbia, but in both provinces land transfer tax revenues have increased fourfold over the past 15 years.

Remarkably, land transfer tax revenues almost doubled between 2015 and 2017 as a result of a booming housing market. These revenues have accordingly increased much faster than provincial property tax revenues. The former have become a very significant source of revenues in British Columbia where they represent 7.5 per cent of total provincial tax revenues, compared to 2.3 per cent in Ontario. In British Columbia, land transfer tax revenues have increased from being the equivalent of 26 per cent of property tax revenues to 89 per cent for the fiscal year ending in 2017. In Manitoba, land transfer tax revenues more than doubled between 2007 and 2016, rising from the equivalent of 1.5 per cent of provincial tax revenues in 2007 to 2.3 per cent in 2016.

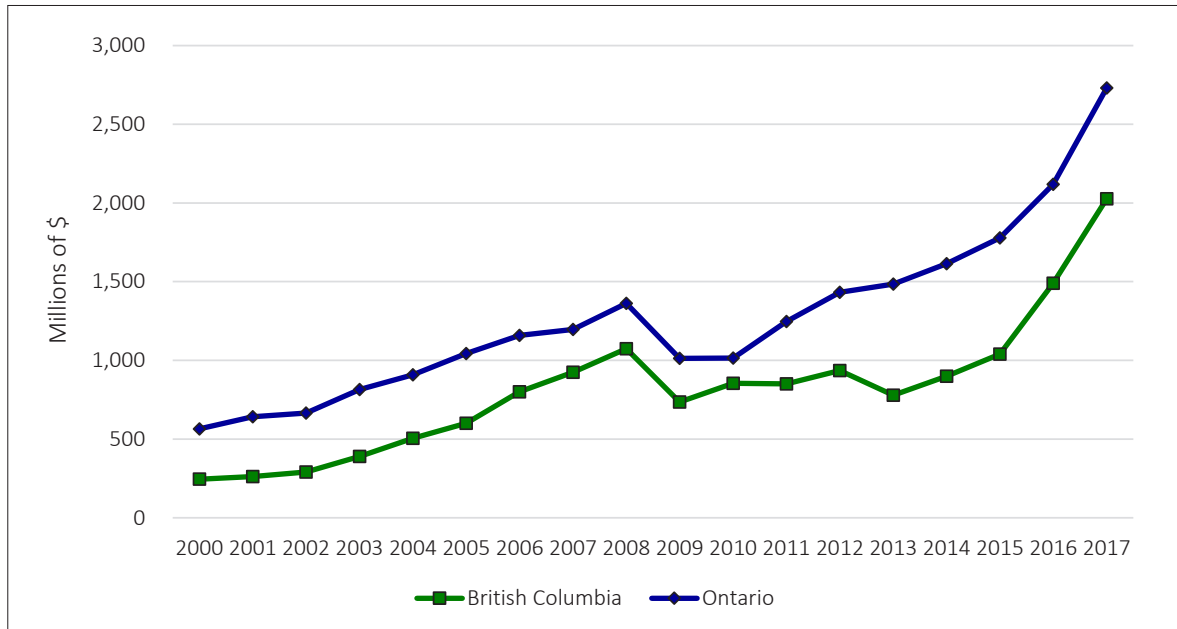
**TABLE 3 CANADIAN PROVINCIAL LAND TRANSFER TAX RATES AND REVENUES**

Province	Rates		2017 Revenues		
	Value of Property	Tax Payable (%)	Land Transfer Tax	Property Tax	Total Tax Revenue
British Columbia*	< \$200,000	1.0%	\$2.03 billion	\$2.289 billion	\$26.910 billion
	\$200,000 - \$1,999,999	2.0%			
	> \$2,000,000	3.0%			
Manitoba	< \$30,000	0.0%	\$83 million	\$799 million	\$10.882 billion
	\$30,000 - \$89,999	0.5%			
	\$90,000 - \$149,999	1.0%			
	\$150,000 - \$199,999	1.5%			
	> \$200,000	2.0%			
New Brunswick	All Property	1.0%	\$23 million	\$503.5 million	\$4.283 billion
Ontario	< \$55,000	0.5%	\$2.728 billion	\$5.868 billion	\$94.346 billion
	\$55,000 - \$249,000	1.0%			
	\$250,000 - \$399,999	1.5%			
	\$400,000 - \$1,999,999	2.0%			
	> \$2,000,000	2.5%			
Prince Edward Island	< \$30,000	0.0%	\$6 million	\$114.1 million	\$885.4 million
	> \$30,000	1.0%			

\* Note, the land transfer tax rate for B.C. highlighted here is for purchases prior to 2018. In 2018, the B.C. government amended the *Property Transfer Tax Act*, where residential properties with values greater than \$3 million are subject to an additional two per cent tax rate on top of the three per cent rate paid for a property valued at \$2 million. However, since this study does not focus on the future estimates of a land transfer tax in B.C., we will not include the new 2018 rate. The sourced *Property Transfer Tax Act* is the older version of the act prior to it being amended in 2018.

Sources: British Columbia (2017, 16), "*Property Transfer Tax Act*, RSBC 1996, c 378" (2016), Manitoba (2017, 4), Manitoba (2018), New Brunswick (1983), New Brunswick (2017, 167), Ontario (2018a), Ontario, (2018b, 221), Prince Edward Island (2017, 14) and Prince Edward Island (2018).

**FIGURE 1 LAND TRANSFER TAX REVENUES IN BRITISH COLUMBIA AND ONTARIO**



Sources: “British Columbia Budgets: Previous Years Budgets and Fiscal Plans” (2018a) and “Ontario Budget: Past Editions” (2018).

## 2.1 A Closer Look at Land Transfer Taxes in British Columbia

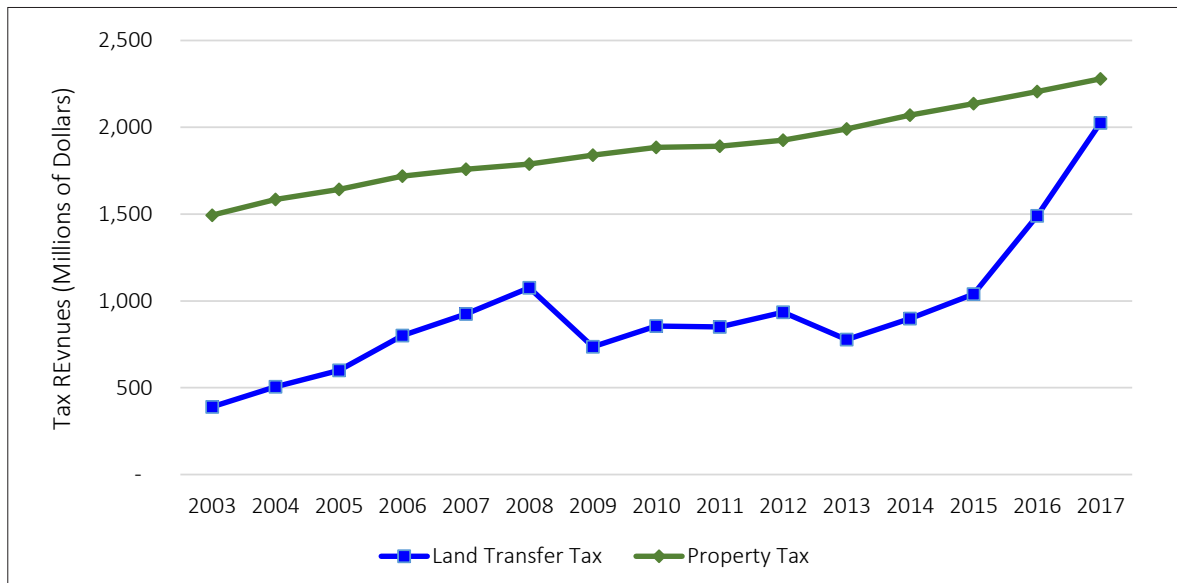
Below we provide a more detailed analysis of the growth of the land transfer tax in British Columbia, which increased from \$390 million in 2003 to \$2.03 billion in 2017. Over this period, the only change to the land transfer tax rates was in 2010, when a three-per-cent tax was levied on the value of property above \$2 million. While one of the driving forces in the astonishing land transfer tax revenue growth was the 20 per cent increase in the number of annual residential property sales over this time, the increase was mainly due to the 166 per cent increase in the value of the average residential sales price in British Columbia. This was primarily driven by the Greater Vancouver and the Lower Mainland/Southwest Region,<sup>6</sup> where the average residential sales price increased by more than 200 per cent. The average fair market value for a property in this region was \$933,810 in 2017. The average fair market value for property in British Columbia, excluding property in the Lower Mainland/Southwest Region, was only \$431,467.<sup>7</sup> Based on these property values, we estimate that in 2017 the land transfer tax on the average residential property outside of the Lower Mainland/Southwest Region was \$6,646 and in the Lower Mainland/Southwest Region, it was roughly \$19,850. The average land transfer tax across B.C. on residential property was over \$14,000.

Prior to 2017, the land transfer tax supplemented total tax revenues raised by the provincial government and were not nearly as important as provincial property tax revenues. Between 2003 and 2015, the land transfer tax raised the equivalent of 44 per cent of provincial property tax revenues. However, as seen in Figure 2, between 2015 and 2017 land transfer tax revenues nearly doubled in British Columbia; they were equivalent to 68 per cent of the provincial property tax in 2016 and 89 per cent in 2017.

<sup>6</sup> The Lower Mainland/Southwest Region includes Vancouver, the Lower Mainland and Fraser Valley areas, as measured by Statistics Canada.

<sup>7</sup> The average fair market value for property across British Columbia including property in the Lower Mainland/Southwest Region is \$715,500.

**FIGURE 2 BRITISH COLUMBIA PROPERTY TAX AND LAND TRANSFER TAX REVENUE**



Source: "British Columbia Budgets: Previous Years Budgets and Fiscal Plans" (2018b).

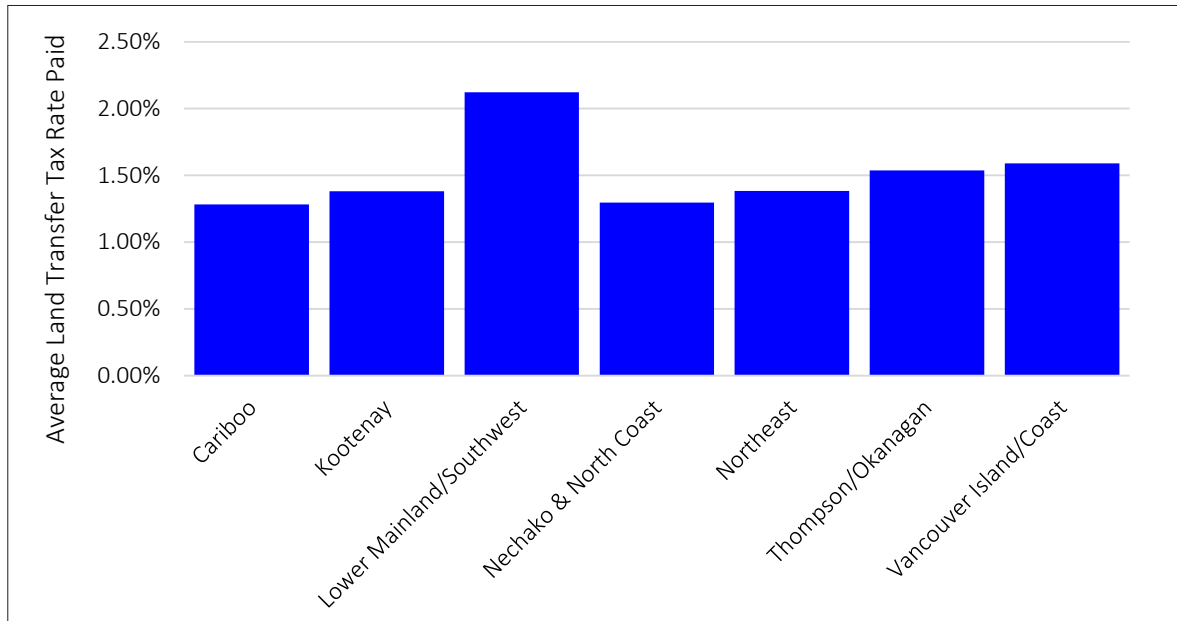
Why is the land transfer tax revenue growing more rapidly than property tax revenues? One reason is that the City of Vancouver implemented land assessment averaging bylaws, which provide temporary tax relief to property owners whose land value has increased significantly year over year (City of Vancouver, 2018). If the value of a residential property increased by 19.62 per cent year over year, then all property tax payments for that year are averaged.<sup>8</sup> The Property Tax Policy Review Commission recommended a 19.62 per cent threshold to be eligible for averaging, which is to be set for a five-year period (City of Vancouver 2017, 2). The last recommendation occurred in March 2014. Land assessment averaging does not apply to land transfer taxes. As a result, land transfer tax revenues have grown with the increase in housing prices, while the averaging policy in Vancouver, where the largest assessed property values exist, has moderated the growth of property tax revenues. Another reason why provincial property taxes are growing at a slower rate than land transfer tax revenues is that the provincial school property tax rate has declined in some years.

Figure 3 shows that in most regions properties are valued between \$200,000 and \$2 million and are subject to a two-per-cent land transfer tax rate. However, a substantial number of properties in the Lower Mainland/Southwest Region are valued at more than \$2 million. These properties are subject to the three-per-cent land transfer tax rate on the amount exceeding \$2 million. Thus a purchaser of property in the Lower Mainland/Southwest Region will pay an average land transfer tax rate of 2.12 per cent. In other regions where the average value of a property is closer to \$200,000, purchasers of properties are likely to pay either the one-per-cent or two-per-cent rate. For example, in the two northern British Columbia regions of Cariboo and Nechako & North Coast, a purchaser will pay the land transfer tax at an average rate of 1.3 per cent. Only the Lower Mainland/Southwest Region has an average land transfer tax rate above two per cent. Even in the Vancouver Island/Coast region, with the second highest value on properties, the fair market value for the average property is \$506,491 and the average land transfer tax rate paid is 1.59 per cent.

<sup>8</sup> If this property does not grow in value by another 19.62 per cent the following year, the owner of the property is expected to pay the normal property tax rate for their assessed property value.



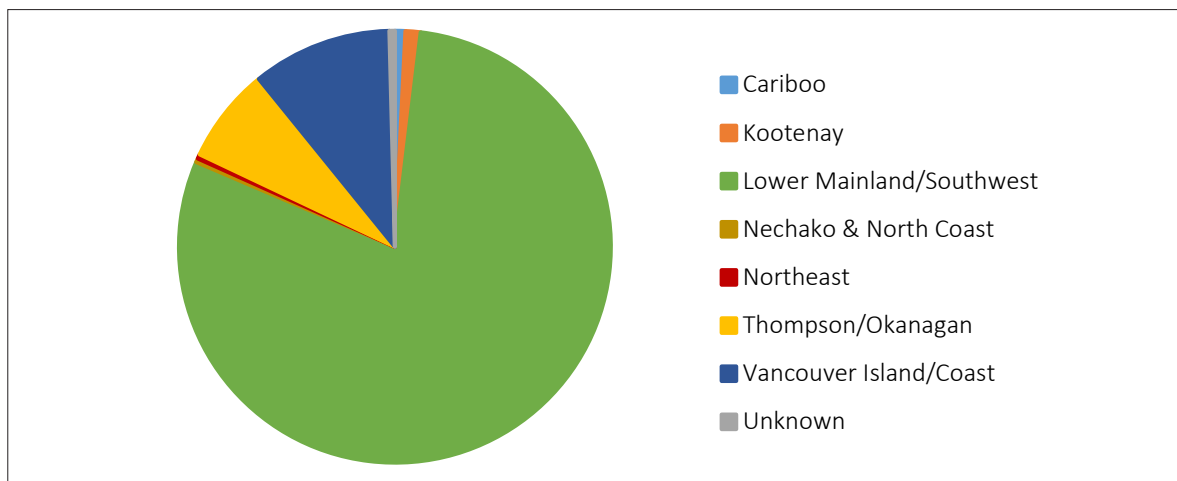
**FIGURE 3 AVERAGE LAND TRANSFER TAX RATE PAID BY ECONOMIC REGION IN BRITISH COLUMBIA**



Calculations done by authors based on regional property transfer tax data from <https://catalogue.data.gov.bc.ca/dataset/property-transfer-tax-data-2017>.

Land transfer tax revenue collections in British Columbia have been concentrated in the populous regions with housing booms. Just over 60 per cent of the population live in the Lower Mainland/Southwest Region. In 2017, this region contributed 79.5 per cent of all the land transfer tax revenue raised in the province, while Vancouver Island/Coast and Thompson/Okanagan accounted for 13 per cent and nine per cent respectively. Why does the Lower Mainland/Southwest contribute such a large portion of total land transfer tax revenues? As stated above, the high fair market value for property in the Lower Mainland/Southwest is one reason, but this region is also responsible for 57 per cent of all land transfer transactions in British Columbia. The combination of high property values and high frequency of transactions pushes the region’s share to nearly 80 per cent of land transfer tax revenue in British Columbia.

**FIGURE 4 THE SHARE OF LAND TRANSFER TAX REVENUES RAISED IN EACH B.C. ECONOMIC REGION IN 2017**



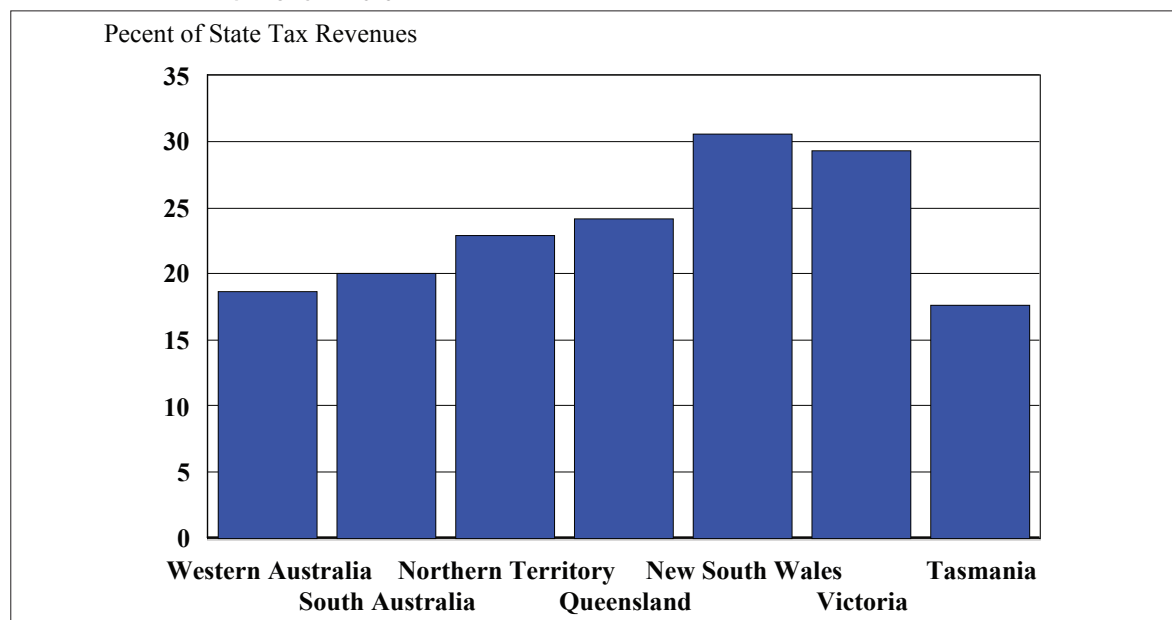
Calculations done by authors based on regional property transfer tax data from <https://catalogue.data.gov.bc.ca/dataset/property-transfer-tax-data-2017>.

Although there is no official breakdown of the land transfer tax revenues from different types of property in British Columbia, we estimate, based on average residential sales prices and the number of residential sales, that 90 per cent of the land transfer tax revenues in 2017 were derived from residential property sales. In 2017, residential property transfers in B.C. represented 96 per cent of all real estate transactions. Only four per cent of transactions in B.C. involved commercial, industrial or agricultural properties. Thus, the land transfer tax in British Columbia is overwhelmingly a tax on residential sales.

## 2.2 Land Transfer Taxes in Australia

While land transfer taxes are a significant source of revenue for Canadian provinces, especially in British Columbia and Ontario, sub-national governments in other countries are more reliant on them. A good example is Australia where all of the states have progressive land transfer tax rate schedules, with the top marginal tax rates varying from 4.5 per cent in Tasmania to 7.0 per cent in New South Wales. Unlike Canadian provinces, the state governments in Australia are unable to levy personal or corporate income taxes or general sales taxes, and as a consequence, land transfer tax revenues are a very important source of state tax revenues. Figure 5 shows that land transfer tax revenues as a percentage of state tax revenues range from 17.6 per cent in Tasmania to 30.6 per cent in New South Wales.

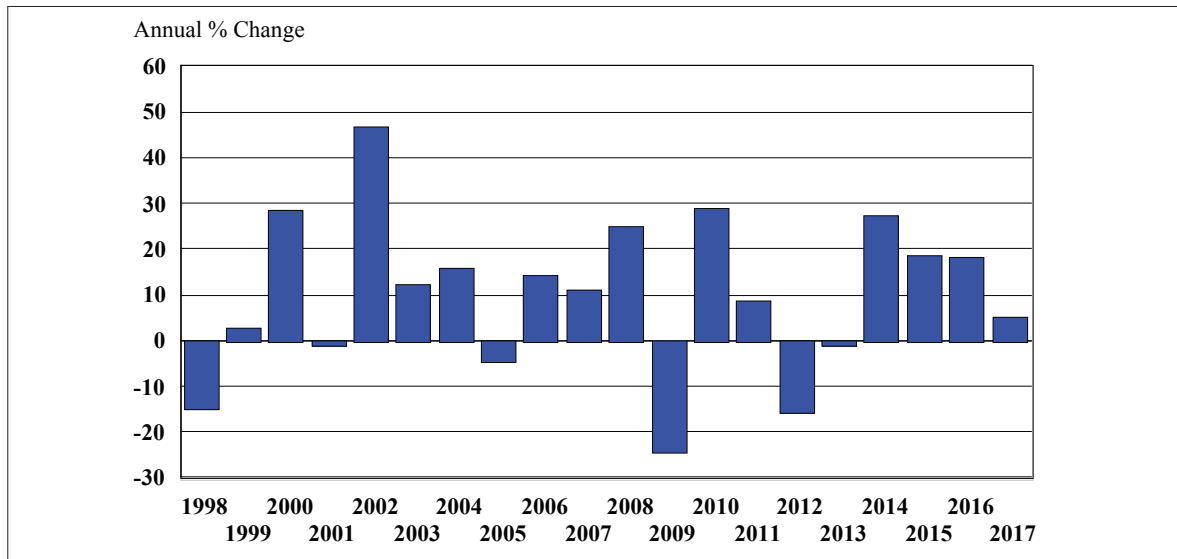
**FIGURE 5 LAND TRANSFER TAX REVENUES AS A PERCENTAGE OF THE AUSTRALIAN STATES' TAX REVENUES IN 2016**



Calculations by the authors. Sources: New South Wales (2016, 5-7), Northern Territory (2016, 58), Queensland (2016, 241), South Australia (2016, 36), Tasmanian Government (2016, 88), Victoria State Government (2016, 25) and Western Australia (2016, 234).

Not only are land transfer taxes important sources of revenues for the Australian states, they are also very volatile sources of revenue. Figure 6 shows that the annual percentage change in land transfer tax revenues in the State of Victoria has ranged from a 46.8 per cent annual increase in 2002 to a 24.4 per cent year-over-year decline in 2009.

**FIGURE 6 ANNUAL PERCENTAGE CHANGE IN REVENUES IN THE STATE OF VICTORIA'S LAND TRANSFER TAX REVENUES, 1998 TO 2017**



Source: "Previous Budgets: Download Publications from Previous Victorian State Budgets" (2018).

Given the high land transfer tax rates and the relative importance of these taxes in the state governments' revenue structures, it is not surprising that a study by Davidoff and Leigh (2013a, 407) concluded that the increase in Australian state land transfer tax from 1993 to 2005 imposed an annual welfare loss of between \$300 million and \$800 million by reducing the number of housing sales transactions by about 11 per cent.

To summarize the Australian experience with state land transfer taxes, it is worth quoting at length the conclusions of the Henry Report, a major review of the Australian tax system in 2010:

Stamp duties on conveyances [land transfer taxes] are inconsistent with the needs of a modern tax system. While a significant source of State tax revenue, they are volatile and highly inefficient and should be replaced with a more efficient means of raising revenue.

Conveyance stamp duty is highly inefficient and inequitable. It discourages transactions of commercial and residential property and, through this, its allocation to its most valuable use. Conveyance stamp duty can also discourage people from changing their place of residence as their personal circumstances change or discourage people from making lifestyle changes that involve a change in residence. It is also inequitable, as people who need to move more frequently bear more tax, irrespective of their income or wealth (Commonwealth of Australia, 2010a).<sup>9</sup>

### 3. THE IMPACT OF LAND TRANSFER TAXES ON HOUSING PRICES AND SALES VOLUMES<sup>10</sup>

There are three basic economic questions to be asked about any tax: Who bears the burden of the tax? Is the tax fair? Does the tax discourage or distort economic activity? Recent econometric studies based on international experience with land transfer taxes provide some

<sup>9</sup> Commonwealth of Australia (2010b).

<sup>10</sup> This section is based on McMillan and Dahlby (2018b).

insights into the first and third questions. With regard to the first question, it is common in most countries for the purchaser of the property to be responsible for the payment of the land transfer tax, although there are exceptions such as in Washington D.C., where the payment is split between the seller and the purchaser. Although the purchaser is generally responsible for paying the land transfer tax, the seller may bear the effective burden in whole or in part to the extent that property prices decline as a result. Most studies adopt a Nash bargaining framework to model the effect of a land transfer tax on the final sales price. If, for example, the housing market is tight, with few properties for sale relative to potential demand, then sellers will have more bargaining power than buyers. In these circumstances, the Nash bargaining model predicts that sellers will bear a larger share of the burden than buyers because sellers have captured most of the “surplus” – the difference between what buyers are willing to pay and what sellers are willing to accept. Since a land transfer tax reduces the surplus, sellers are predicted to bear most of the burden of a land transfer tax in a tight housing market.

Appendix 1 summarizes the economic effects of land transfer taxes on residential housing markets from 11 studies from the U.S., U.K., Germany, France, Australia and Canada. Eight of the 11 studies estimated the impact of land transfer taxes on housing prices. Given that these studies are based on data from different countries with different housing market conditions, one might expect that the degree to which sellers bear the land transfer taxes would vary and the results bear out that conjecture. A study of the land transfer tax in France by Bérard and Trannoy (2017a, 30) concluded that the tax did not affect housing prices although its introduction changed the timing of the transactions. The Besley, Meads and Surico (2014a, 70) study concluded that buyers received 60 per cent of the benefit of a land transfer tax (stamp duty) holiday in the U.K. Dachis, Durantou and Turner (2012b, 348) found that the introduction of a land transfer tax in Toronto reduced the number of transactions by 14 per cent.<sup>11</sup> Davidoff and Leigh (2013b) concluded that sellers bore 100 per cent of the land transfer tax through a reduction in the housing prices in Australia. Finally, three studies – Best and Kleven (2018a), Kopczuk and Munroe (2015a) and Slemrod, Weber and Shan (2016a) – concluded that sellers bear more than 100 per cent of the land transfer tax burden when there is a “notch” in the land transfer tax rate, such that the entire value of a property above a certain level is subject to a higher rate. For example, under New York City’s “mansion tax”, residential housing valued at more than \$1 million is subject to a one-percentage-point increase in the land transfer tax applied to the full value of the transaction. An increase in sales price from \$999,999 to \$1 million adds a \$10,000 tax liability. Not surprisingly, studies of the effects of these notches find that properties that would have sold in a price range above the notch are reduced to the notch and the decline in the value of some properties can be several times the size of the land transfer tax burden created by the notch. These studies show the potentially large, negative impact of land transfer taxes on housing prices.

With regard to the third question – how distortionary is a land transfer tax? – the 11 studies provide a variety of measures of its impact on the volume of housing market transactions. The economic losses from reductions in housing market transactions are real – some families do not move to properties that are more suited to their needs – implying a loss of well-being that can exceed the size of the land transfer tax, i.e., there is a deadweight loss from the tax.<sup>12</sup> In order

<sup>11</sup> However, Haider, Anwar and Holmes (2016) concluded that the LTT’s introduction in Toronto did not have a statistically significant effect on housing sales. They argued that the great recession and mortgage market regulations were responsible for the decline in sales.

<sup>12</sup> For example, Hilber and Lyytikäinen (2015a) found that the land transfer tax in the U.K. reduced lifestyle/lifecycle changes in housing, but did not affect long-distance and employment-related mobility.

to provide a common way of expressing the economic loss from a land transfer tax, we have used the information provided in each study to calculate the implied marginal cost of public funds (MCF) for the land transfer tax. See Dahlby (2008a) on the concept and measurement of the MCF. See also Appendix 2 for the derivation of the formula for calculating the MCFs. The key parameters from the studies that are used to calculate the MCFs are contained in a table in the appendix. Using this common metric allows us to compare the otherwise diverse ways of expressing the economic impact of a land transfer tax. The estimates of the MCFs range from 1.00 for the Slemrod, Weber and Shan (2016b) study, which is the only study that did not find an impact of Washington's notched land transfer tax on the volume of transactions, to 5.65 for the Australian study by Davidoff and Leigh (2013c). In contrast to the Slemrod, Weber and Shan result, the MCF in the Kopczuk and Munroe (2015b) study of the notch created by New York City's mansion tax was 2.41. While there is a wide range of estimates of the MCF for the land transfer tax, the size of the welfare loss from generating an additional dollar of land transfer tax revenue is higher, the higher the land transfer tax rate. To summarize, a number of the studies have found a significant reduction in housing market transactions and that the welfare cost of raising tax revenues through a land transfer tax is high. Many of these studies' authors conclude that a land transfer tax is a more distortionary and a less cost-effective way of generating tax revenue than a residential property tax.

This raises the question: Why do taxpayers accept a land transfer tax when it could be replaced by an increase in the property tax? The Määttänen and Terviö (2018a) study provides some insight into the political attractiveness of the land transfer tax. They found that:

Despite aggregate welfare gains from replacing the transaction tax with a property tax, many households may be worse off with such a reform ... the share of households that are worse off is increasing in the initial transaction tax rate up to tax rates close to the peak of the Laffer curve. This result may explain why there appears to be political support even for high transaction tax rates that are very distortionary. (Määttänen and Terviö, 2018b, 26).

Only a minority of households expect to move with a 10-year time horizon. If these voters do not take into account that the land transfer tax may be capitalized in property values, they might expect to defer paying the land transfer tax burden into the future, reducing its impact on them in present-value terms relative to an annual property tax.

We now take up the second basic question: Is the land transfer tax burden fair? Since both a land transfer tax and a property tax are levied on the value of the property, it is natural to compare the fairness of one with the other. However, one important difference is that a property tax is levied each year on the property's owner, while a land transfer tax is only levied when the ownership of the property is transferred,

As previously noted, the distributional effects of these taxes depend on the shifting of the tax burden. The literature indicates that the land transfer tax burden may be split between buyer and seller, but in many cases individuals will be both a buyer and a seller, sometimes almost simultaneously. To the degree that land transfer taxes are shifted to the owners of residential property, which Dachis, Duranton and Turner (2012c) concluded in their study of the land transfer tax in Toronto, then the tax will be capitalized in the value of all residential property at the time that it is imposed. If a reduction in property taxes is also capitalized in residential property values, then the overall value of property would not change and the effective incidence of the land transfer tax and the property tax would be the same. As McMillan and Dahlby (2014) have argued, the value of a family's residence will generally reflect its lifetime incomes,

and the burden of both taxes can be considered roughly proportional to lifetime earnings. (Those who inherit more wealth may live in larger, more expensive homes than their lifetime labour earnings would otherwise provide, but this makes a property tax more progressive than a land transfer tax, if a land transfer tax is not levied on residences transferred as part of an estate). Given this caveat, and also recognizing that the capitalization of land transfer taxes and property taxes means that it is difficult to assign the burden of these taxes to current taxpayers, the distributional impact of a land transfer tax, over the long term, is likely similar to a property tax. Finally, a study by Määttä and Terviö (2018c) which simulated replacing a land transfer tax with a property tax in Helsinki, confirmed the conjectures of many other studies that households, as a group, would be better off if the land transfer tax were replaced by a revenue-neutral increase in a property tax.

On the other hand, if the land transfer tax is not shifted to owners and is fully borne by home buyers, it would impose an additional burden on those who move more frequently –sometimes with limited choice because of changes in the location of employment.<sup>13</sup> For example, Nowland (2007, iii) shows that if a 1.25 per cent land transfer tax were substituted for property taxes, an average property owner in Toronto would be better off in present-value terms if their property is sold and another bought after 10 years. In other words, frequent movers will pay more often and infrequent movers will pay less. Although younger cohorts are more likely to be renters initially, over their lifetimes they will on average purchase homes more frequently than older cohorts, which means that a non-shifted land transfer tax will generally impose a larger burden on younger generations.

#### **4. A LAND TRANSFER TAX FOR ALBERTA?**

Given the province's current and projected fiscal deficits, the Alberta government may want to consider adopting new sources of tax revenue. One consideration in adopting a land transfer tax in Alberta is its revenue potential. Of course, there are other considerations, including the distribution of the burden of the tax by income group and by region and its effect on the volume of real estate transactions. We also provide an assessment of those impacts.

Land title transactions in Alberta can be categorized into six types, but the relevant category for our study is the transfer of land, which represents over 97 per cent of the total value and number of transfers.<sup>14</sup> A cursory review of the data indicates that there were two anomalous years in terms of the value of land transfers. In 2010, the value of land title transfers skyrocketed to \$416.4 billion from \$44.3 billion in 2009, before returning to \$45.2 billion in 2011. Another anomaly occurred in 2016 when the value of land title transfers increased to \$172.6 billion from \$54.8 billion in 2015, before declining to the more normal level of \$50.7 billion in 2017. We have been unable to determine the nature of the transactions that resulted in these extraordinary increases in the value of land title transfers in 2010 and 2016, but in both cases the dramatic increases occurred in Calgary. Given that such large transactions would

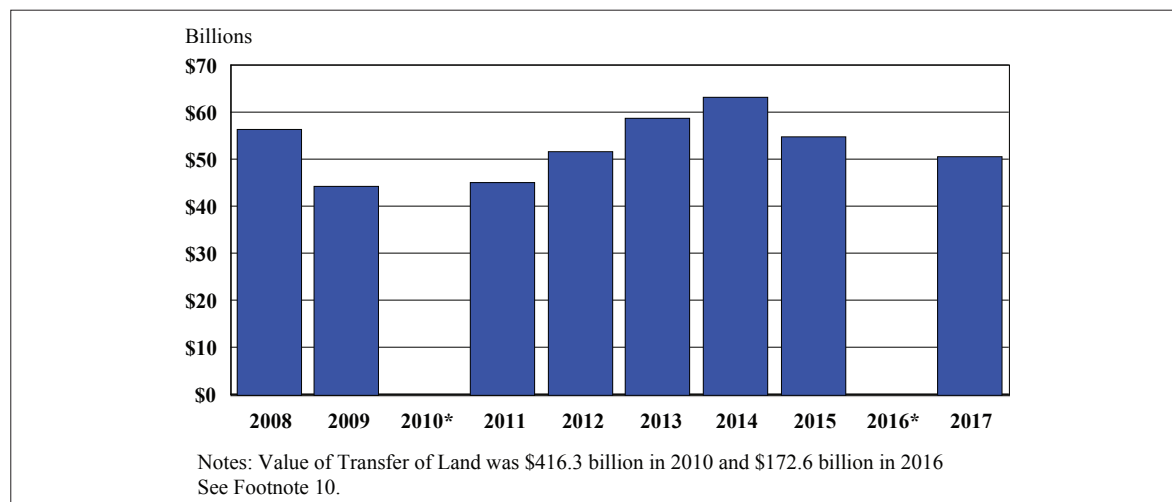
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<sup>13</sup> See Commonwealth of Australia (2010c, Chapter 6.2) for an estimate of the effective tax rates based on frequency of moves under the states' land transfer taxes. [http://taxreview.treasury.gov.au/content/FinalReport.aspx?doc=html/publications/papers/Final\\_Report\\_Part\\_1/chapter\\_6.htm](http://taxreview.treasury.gov.au/content/FinalReport.aspx?doc=html/publications/papers/Final_Report_Part_1/chapter_6.htm)

<sup>14</sup> We are grateful to Fareeza Khurshed, manager, Statistical Services, Treasury Board and Finance for providing us with these data. The other categories of title transfers are orders, transfer of leasehold title, park leases, leasehold title application, transfer of part of land and all others.

either not be subject to a land title tax or would not have occurred if even a very modest land title tax had been in place in those years, we have omitted the value of land title transactions in those two years in Figure 7.

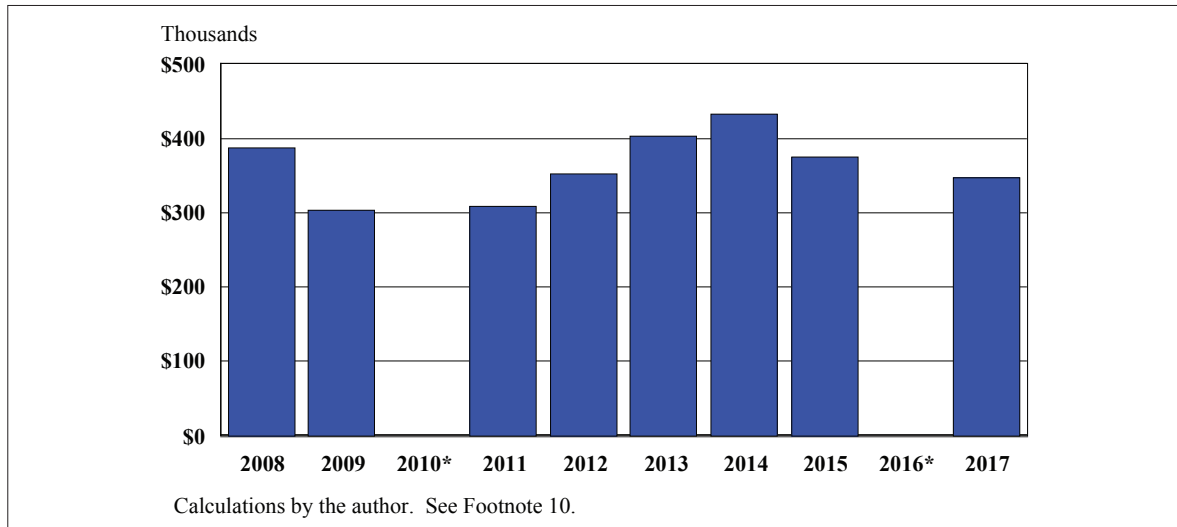
**FIGURE 7 TOTAL VALUE OF TRANSFERS OF LAND IN ALBERTA 2008 TO 2017**



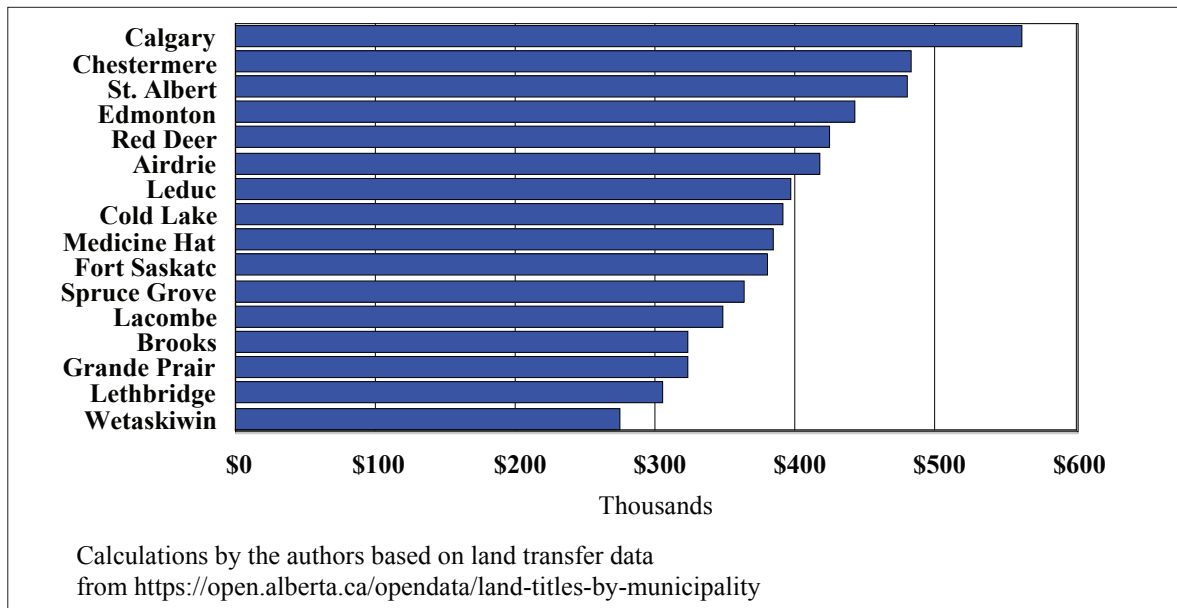
Excluding 2010 and 2016, the average total value of land transfers was \$53.1 billion per year from 2008 to 2017. Consistent with what has been observed in other jurisdictions, the value of land transfers has exhibited wide variations over relatively short time periods. Between 2008 and 2009, with the onset of the financial crisis and a decline in oil prices, the value of land transfers declined by 28 per cent. During the recovery from 2011 to 2014, they increased by 40 per cent, before declining by 20 per cent in 2017. Also, not surprisingly, the number of land transfers is pro-cyclical. These data reinforce the view that a land transfer tax in Alberta would be a highly volatile source of tax revenue. The variations in land transfer tax revenues would be highly correlated with ups and downs in the provincial economy and therefore with the province’s non-renewable resource revenues. A land transfer tax would likely exacerbate the volatility of provincial revenues, making budgeting and fiscal decisions even more difficult than currently.

The annual average values of land transfers from 2008 to 2017, as shown in Figure 8, also follow a pro-cyclical pattern and have ranged from just over \$300,000 in 2009 and 2011 to a high of \$433,000 in 2014. While Figure 8 emphasizes the variation in the average value of a land transfer over time, there are also large variations in the average value of land transfers across municipalities. Figure 9 shows that the average value of land transfers in Alberta cities in 2017 ranged from \$561,274 in Calgary to \$274,744 in Wetaskiwin. Although these data do not distinguish residential property transfers from other property transfers, the data from British Columbia suggest that residential property constitutes over 90 per cent of land title transfers in cities. This suggests that the sale of an average residence in Calgary would likely bear twice as much tax as a sale in Wetaskiwin.

**FIGURE 8 THE AVERAGE VALUE OF LAND TRANSFERS IN ALBERTA 2008 TO 2017.**



**FIGURE 9 AVERAGE VALUE OF LAND TRANSFERS IN ALBERTA CITIES IN 2017**



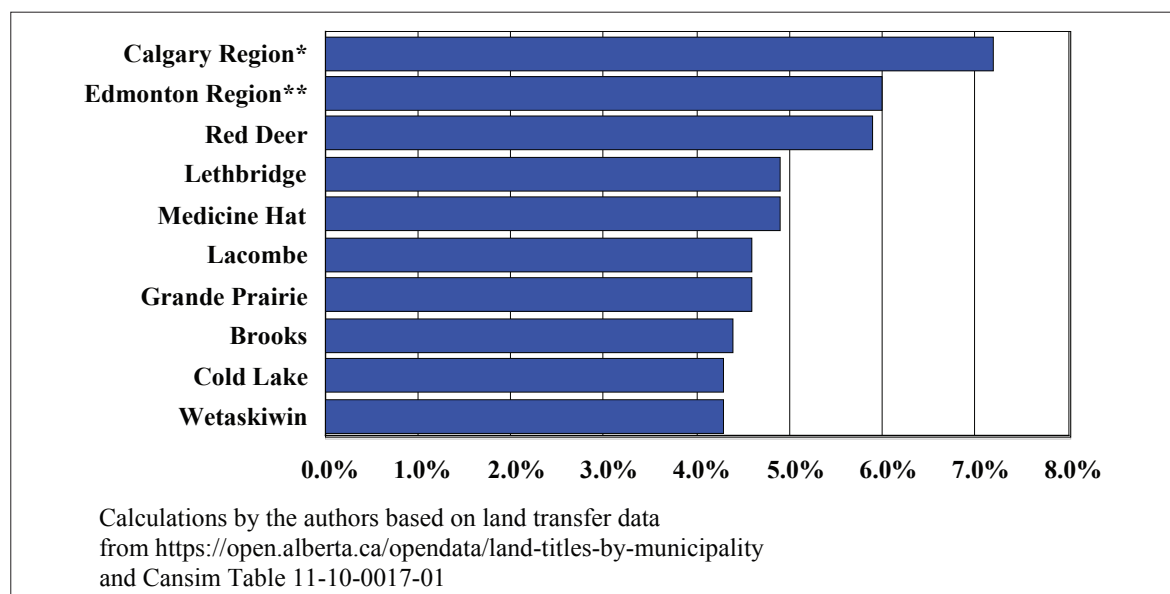
In order to compare the size of a land transfer tax to a typical household's income, we have calculated the burden of a one per cent tax on the average land transfer as a percentage of the median family's before-tax income in the Calgary and Edmonton regions and in eight other Alberta cities.<sup>15</sup> These calculations approximate the burden of a one-per-cent land transfer tax on the sale of a typical residence for middle-income families in these Alberta cities. Figure 10 shows that a one-per-cent land transfer tax would have been about 7.2 per cent of the median family income in the Calgary region and about 6.0 per cent in the Edmonton region and Red Deer in 2015. In the other smaller cities in Alberta, the burden of a one-per-cent land transfer tax in 2015

<sup>15</sup> The Calgary region's and the Edmonton region's average land transfers are based on a population-weighted average value of land transfers in the cities of Calgary, Airdrie and Chestermere, and in Edmonton, Fort Saskatchewan, Leduc, St. Albert and Spruce Grove, respectively. The median family incomes for the CMAs in Calgary, Edmonton and the other cities in Figure 10 are based on Statistics Canada data in Table 11-10-0017-01.



would have been between four and five per cent of the median before-tax family income. These calculations indicate that the burden of even a modest land transfer tax would be substantial for a typical family, although this tax is only paid when a family changes its residence.

**FIGURE 10 A ONE-PER-CENT LAND TRANSFER TAX AS A PERCENTAGE OF THE MEDIAN BEFORE-TAX FAMILY INCOME IN 2015**



The amount of revenue generated by a land transfer tax in Alberta would depend on the tax rate or rates if more than one rate applies to the value of a transfer. It also depends on the value of an average property transfer and the number of land transfers. Given the levels of urbanization in these Alberta municipalities, we feel justified in assuming that the vast majority of land transfers, as in B.C., are of residential properties. In the absence of any information about the rates that the Alberta government might adopt, we have assumed a one-percentage-point tax rate on the value of land transfers. If we assume that this tax would have no effect on the value of a typical transfer or the volume of real estate transactions, then a one-per-cent land transfer tax in Alberta in 2017 would have yielded \$507.7 million. To put this figure in perspective, the Alberta government's total tax revenue in 2017-2018 was \$21.2 billion and the education property tax revenue was \$2.446 billion. In other words, in the absence of any impact on the value or volume of real estate transactions, a one-per-cent land transfer tax would have increased the government's total tax revenues by 2.4 per cent or yielded about 20 per cent of the education property tax revenue.<sup>16</sup> However, imposing a land transfer tax would most likely have negative impacts on the volume and value of real estate transactions. Our survey of the literature on the impact of land transfers in other jurisdictions indicates that there is a very wide range of estimates of the magnitudes of these effects. To provide some perspective of how changes in the volume and value of real estate transaction might affect projected revenues, we have used the estimates of the impact of the land transfer tax in Toronto by Dachis et al. (2012d) who found that the introduction of Toronto's land transfer tax increased

<sup>16</sup> To put the revenues from a one-per-cent land transfer tax in perspective, raising an additional \$500 million in education property tax in 2018-2019 would have required an increase in the residential mill rate from 2.56 to 3.08 and the non-residential mill rate from 3.76 to 4.53. Calculations based on Alberta Tax Plan Tables at <https://www.alberta.ca/budget-documents.aspx#18-19>.

the total transfer tax rate on the median property value from two per cent to four per cent. They concluded that property values declined by the amount of the tax and that the volume of transactions declined by 14 per cent. Scaled to a one-per-cent land transfer tax in Alberta, their study suggests that the value of a typical transaction would fall by the amount of the tax, i.e., one per cent, and the volume of transactions might fall by seven per cent. Using these rough estimates of the tax's impact, the projected revenue would be 92 per cent of the previous figure or \$467 million. Of course, the government of Alberta might impose a substantially higher rate, as in Ontario and British Columbia, but the slippage in tax revenues because of declines in the value and volume of land transfers would be more than five per cent, perhaps as much as 15 per cent for a three-per-cent land transfer tax.

To summarize, a land transfer tax has the potential to raise a significant amount of revenue in Alberta in the \$0.5 billion to \$1.5 billion range, but obviously not enough to cover the current fiscal deficit. However, the tax would impose an economic cost through the reduction in real estate transactions than would otherwise have taken place. It would require a relatively high tax payment by middle-income families, especially in the Calgary and Edmonton regions, when they purchase another home and could in some cases add a significant amount to their mortgage debt.

## **5. CONCLUSIONS**

Should Alberta adopt a land transfer tax? Our recommendation is “No”. A large body of recent empirical studies indicates that land transfer taxes discourage residential property transactions and impose a larger welfare loss per dollar of tax revenue than is associated with residential property taxes. Furthermore, land transfer taxes are highly volatile sources of tax revenue. The variations in land transfer tax revenues would be highly correlated with ups and downs in the provincial economy and therefore with the province's non-renewable resource revenues. A land transfer tax would exacerbate the volatility of provincial revenues, making budgeting and fiscal decisions even more difficult than currently. Land transfer taxes are no more progressive than a property tax. Attempts to make land transfer taxes more progressive by instituting notches in the rate structure are particularly distortionary. Also, a one-per-cent tax on an average land transfer in 2015 would represent six- to seven per cent of median household income in Edmonton and Calgary, a substantially higher rate than in other Alberta cities.

In our view, if the Alberta government feels the need to increase its tax revenues to deal with the province's fiscal situation, other new revenue sources should be considered, such as a provincial sales tax, which has a relatively low marginal cost of public funds (see Dahlby and Ferde, 2012, 2018), or the province could increase the education property tax instead of introducing a land transfer tax.

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## APPENDIX 1. SUMMARY OF STUDIES OF THE ECONOMIC EFFECTS OF LAND TRANSFER TAXES

Study	Description of Data	Incidence of the Land Transfer Tax	Impact on Transactions	Estimated Marginal Cost of Public Funds	Discussion
Hilber and Lyytikäinen (2015b)	Census data on U.K. households from 1996 to 2008, with self-assessed values of home and data on households that moved in the following year.	Not included in the study.	A two- percentage-point increase in stamp duty reduced household mobility by 35% to 42%.	1.73	Stamp duties reduced life-style/life-cycle changes in housing but did not affect long-distance and employment-related mobility. A property tax is a more efficient means of raising tax revenues than a stamp duty.
Dachis, Duranton and Turner (2012e)	Data on residential real estate transactions in Toronto neighbourhoods close to bordering municipalities without the municipal land transfer tax between 2006 and 2008.	The land transfer tax reduced housing prices by the amount of the tax.	The Toronto land transfer tax reduced housing transactions by 14 per cent.	1.29	Property taxes are less distortionary than a land transfer tax.

Study	Description of Data	Incidence of the Land Transfer Tax	Impact on Transactions	Estimated Marginal Cost of Public Funds	Discussion
Besley, Meads and Surico (2014b)	Stamp duty holiday in 2008 in the U.K. eliminated the one-per cent tax for transaction in the £125,000 to £175,000 range.	Prices declined by 60 per cent of the reduction in the stamp duty.	Transactions during the stamp duty holiday increased by eight per cent. This is a short-term timing effect as indicated by declines in transactions before and after the holiday period.	1.04 with a 95 per cent confidence interval of 1.02 to 1.15	The stamp duty in the U.K. has significant effects on residential prices and the volume of transactions.
Best and Kleven (2018b)	Administrative data on stamp duties between 2004 and 2012 in the U.K. Focused on the effects on transactions at notches in stamp duty, from 0 to 1% at £125K, 1% to 3% at £250K, 3% to 4% at £500K, 4% to 5% at £1,000K, and 5% to 7% at £2,000K.	The effect of a notch in the rate schedule is to reduce the house price by four to five times the size of the tax liability jump.	The stamp holiday in 2008-2009 in the £125K to £175K price range increased housing transactions by 20 per cent in the short run.	1.10	Reductions in stamp duty are an effective instrument for short-run fiscal stimulus.

Study	Description of Data	Incidence of the Land Transfer Tax	Impact on Transactions	Estimated Marginal Cost of Public Funds	Discussion
Bérard and Trannoy (2017b)	There was an increase in the land transfer tax ( <i>droits de mutation</i> ) by 0.7 percentage points in March 2014, from 3.8 % to 4.5% in many (but not all) of France's <i>départements</i> . The municipalities also imposed a land transfer tax of 1.20% and the central government 0.09% for tax collection and administration.	Buyers and sellers are more likely to move the sale date (anticipation effect) than to change the sale price.	The announcement of an increase in the land transfer tax increased sales by 28% in the month before its implementation. Housing transactions regressed 7% during the immediate time after the increase. The average net effect corresponds to a drop in the transactions of 4.6% over a period of 10 months following the implementation date.	1.47	The elasticity of the tax base with respect to the tax rate was -0.45 and the elasticity of the departmental tax revenue with respect to the tax rate was 0.65 (on the increasing side of the Laffer curve). An alternative estimate of the MCF based on the revenue elasticity is $1/0.65 = 1.54$ based on the response of total revenues to all three levels of government.

Study	Description of Data	Incidence of the Land Transfer Tax	Impact on Transactions	Estimated Marginal Cost of Public Funds	Discussion
Kopczuk and Munroe (2015c)	This study examined the impact of the "mansion tax" in NYC and NJ. Residential housing $\geq$ \$1M subject to 1% increase in the land transfer tax applied to the full value of the transaction. An increase in sales price from \$999,999 to \$1 million adds a \$10,000 tax liability. A 1.425% tax is also levied in NYC for transactions above \$500,000.	With the mansion tax, sales that would have been up to \$1,021,000 shift to the notch. Sellers take price cuts larger than the cost of the tax on average and bear up to 200% of the tax. For the 1.425% tax, the sellers bear 82.7% of the burden on newly developed property.	The one percentage point of land transfer tax applied at the \$1 million limit eliminated 2,800 transactions, or approximately 26.1 per cent of the transactions that would have occurred in the absence of the mansion tax. A significant amount of bunching of sales prices occurs just below the \$1 million.	2.41	Price reductions above the notch are permanent and dispersion of sales prices conditional on list prices increases, indicating a decline in market efficiency. "The notched design of the tax can destroy a market for housing with values close to the notch, which has not been previously recognized."

Study	Description of Data	Incidence of the Land Transfer Tax	Impact on Transactions	Estimated Marginal Cost of Public Funds	Discussion
Slemrod, Weber and Shan (2016c)	Data on all residential transactions in Washington D.C. 1999 to 2010. Examining the sales of houses after the implementation of two price notches in the land transfer tax, one in 2003, when the tax rate increased from 2.2% to 3% for sales above \$250,000, subsequently eliminated in 2004, and in 2006 when the tax rate increased from 2.2% to 2.9% for houses above \$399,999.	The introduction of the notches affected the sales price rather than the timing of the sales. Prices \$5,000 above the notch (1.8 times the increase in the tax liability) are reduced to the notch price.	The introduction of notches did not affect the timing of sales or the volume of transactions.	1.00	The efficiency loss from introducing a residential land transfer tax is small.



Study	Description of Data	Incidence of the Land Transfer Tax	Impact on Transactions	Estimated Marginal Cost of Public Funds	Discussion
Buettner (2017a)	Data on land transfer tax revenues for 16 German state governments from 2002 to 2015. In 2006, state governments gained the ability to increase land transfer tax rates from 3.5%. By 2015, the median state land transfer tax increased to 5%.	No data on sales prices.	A one- percentage- point increase in the land transfer tax increased revenues by 12.7%. The implied reduction in transaction from the 1.5- percentage- point increase in the median land transfer tax rate was 24%.	1.57	The semi-elasticity of revenues with respect to the tax rate is 0.127. An additional euro of land transfer tax revenue is associated with a 67-cent welfare loss. The land transfer tax is a rather costly source of tax revenue.

Study	Description of Data	Incidence of the Land Transfer Tax	Impact on Transactions	Estimated Marginal Cost of Public Funds	Discussion
Davidoff and Leigh (2013d)	Data on housing prices by area code in Australian states for the years between 1995 and 2005. Land transfer tax (stamp duty) rates vary by state and with a progressive rate structure. In NSW marginal land transfer tax rates vary from 1.25% for property below \$14,000 to 7% for property above \$3 million. Average rates are increased from 2.4% in 1993 to 3.3% in 2005 as a result of bracket creep.	Elasticity of house prices with respect to land transfer tax rates is -0.26. Prices fall by the full amount of the tax. In bordering postal codes, the elasticity was even higher (-0.46.)	A 10% increase in stamp duty lowers turnover by 6% over the following three years. The increase in the average stamp duty rate between 1993 and 2005 is estimated to have reduced transactions by 23%.	5.65	In 2005, the welfare loss per sale forgone is estimated to be between \$8,000 and \$20,000.

Study	Description of Data	Incidence of the Land Transfer Tax	Impact on Transactions	Estimated Marginal Cost of Public Funds	Discussion
Bogataj, McDonnell, and Bogataj (2016)	Model the lifecycle transitions between different types of housing units based on housing needs. Data from European Union, focus on Spain.	Net present value of taxation for an aging individual over time with an 8% land transfer tax, 0.5% annual property tax and a 6% interest rate is 35,43.83 euros. A reduction in the land transfer tax from 8% to 2% can be offset by a 1% increase in the annual property tax, to get the same net present value of tax revenues.	A senior citizen with decreasing functional capacities will not move into a home that suits his or her capabilities to avoid the upfront land transfer tax. More likely to move if they are paying a property tax that would be less because of a smaller home/property. Allow a growing family to move into larger property.	N/A	A recurring (periodic) taxation of housing property would be better suited to deal with shrinking cities and an aging population than a property transaction tax. The upfront cost of the PTT causes individuals in Spain not to move, leaving over three million houses empty in 2014. More permits for remodelling homes were applied for after the land transfer tax came into effect.

Study	Description of Data	Incidence of the Land Transfer Tax	Impact on Transactions	Estimated Marginal Cost of Public Funds	Discussion
Määttänen and Terviö (2018d)	Simulation model of the effect of land transfer tax on the housing market in Helsinki, Finland based on 2004 data on housing prices and household incomes.	Housing prices decline with higher land transfer tax rates. The majority of households were worse off when a 2% land transfer tax was replaced with an equal yield property tax increase. Only 33% of households are expected to move within the city in a 10-year period. Non-movers are worse off with the property tax increase but their losses are relatively small.	An increase in the land transfer tax reduces the volume of housing transactions that is similar to the reduction found in previous econometric studies.	1.30	The MCF increases rapidly with the increase in the land transfer tax rate. MCF = 3.00 at a 7% rate. The Laffer curve of land transfer tax revenues peaks at a 10% rate.

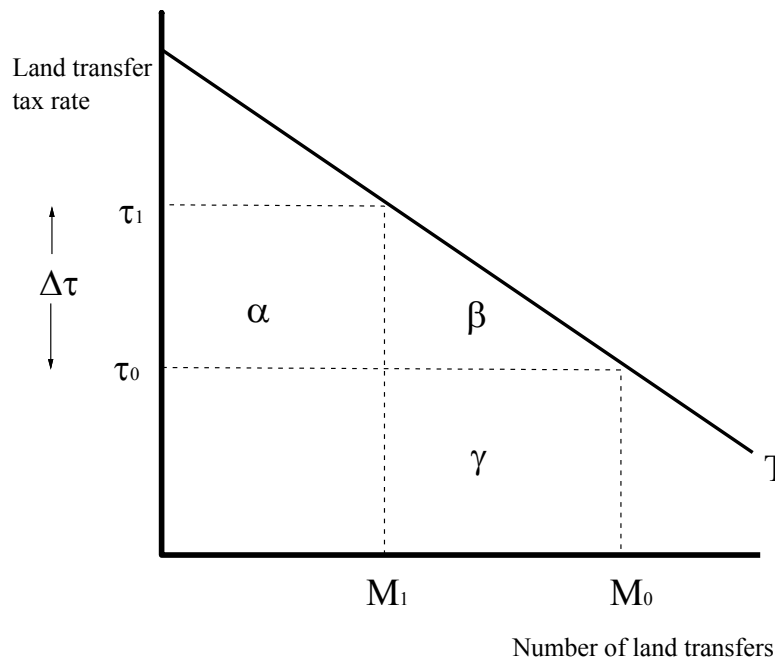
## APPENDIX 2. MEASURING THE MARGINAL COST OF PUBLIC FUNDS FROM A LAND TRANSFER TAX

Below we outline a simple model for calculating the marginal cost of public funds (MCF), a measure of the efficiency loss from a land transfer from econometric studies that report the initial tax rate, the increase in the tax rate and the percentage reduction in the number of housing transactions.

The basic model for calculating the MCF is shown in Figure 1 below and based on Dahlby (2008b, Chapter 2.4). An increase in the land transfer tax rate from  $\tau_0$  to  $\tau_1$  reduces the number of land transfers from  $M_0$  to  $M_1$ . The loss of consumer surplus is the area  $\alpha + \beta$ . The increase in tax revenues (ignoring the interaction with other tax bases) is  $\alpha - \gamma$ . The MCF is equal to  $(\alpha + \beta) / (\alpha - \gamma)$ .

Below we derive a formula for the MCF based on the initial tax rate,  $\tau_0$ , the increase in the tax rate,  $\Delta\tau$ , and the proportionate rate of change in the number of transactions,  $\rho$ . Since  $(\alpha + \beta) = \Delta\tau \cdot 0.5 \cdot (M_0 + M_1)$ ,  $(\alpha - \gamma) = \Delta\tau \cdot M_1 - \tau_0 \cdot (M_0 - M_1)$ , and  $\rho + 1 = M_1 / M_0$ , the MCF can be written as:

$$\text{MCF} = \frac{0.5 \cdot \Delta\tau \cdot (2 + \rho)}{\Delta\tau \cdot (1 + \rho) + \tau_0 \cdot (\rho)}$$



**TABLE A1 SUMMARY OF KEY PARAMETER RESULTS AND MCF CALCULATIONS**

Study	$\tau_0$	$\Delta\tau$	$\rho$	MCF
Dachis, Duranton and Turner (2012f)	0.02	0.02	-0.14	1.29
Davidoff and Leigh (2013e)	0.024	0.009	-0.23	5.65
Best and Kleven (2018c)	0.01	-0.01	0.20	1.10
Besley, Meads and Surico (2014c)	0.01	-0.01	0.08	1.04
Kopczuk and Munroe (2015d)	0.0145	0.01	-0.26	2.41
Hilber and Lyytikäinen (2015c)	0.01	0.02	-0.347	1.73
Slemrod, Weber and Shan (2016d)	0.022	0.008	0.00	1.00
Bérard and Trannoy (2017c)	0.0509	0.007	-0.04	1.47
Buettner (2017b)*	--	--	--	1.57
Määttänen and Terviö (2018e)**	--	--	--	1.30

\* The MCF for the Buettner study was calculated based on the formula  $MCF = 1/\tau \cdot \eta$  where  $\tau$  is the tax rate and  $\eta$  is the semi-elasticity of revenue with respect to the tax rate, with  $\tau = 0.05$  and  $\eta = -12.7$ .

\*\* Määttänen and Terviö (2018f) computed the MCF based on their computable general equilibrium model of the housing market in Finland.

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