

Estimating Sales Tax Evasion in Canada, 1991-2007

by

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1 Introduction

Consumption taxes, and broad-based general sales taxes in particular, have over the last several decades become a larger and larger source of revenue for governments across the world – and Canada is no exception. General sales tax revenue accounted for 9% of the Government of Canada’s total revenues in 1981-1982 (The National Finances 1994, 4:5), compared to 12% in 1991-1992 and 17% in 2004-2005 (Statistics Canada Table 385-0001). While this ratio has fallen recently because of the current government’s two-point cut of national sales tax, the longer-term trend is certainly that revenues from sales taxes are on the rise, and remain a significant source of revenue for the federal government. Provincial governments, too, rely heavily on sales taxes – even though they technically do not have the constitutional power to levy indirect taxes. Over the past twenty years, sales taxes have made up 12-14% of total provincial government revenues (Statistics Canada Table 385-0002).

Indeed, indirect taxation has been an important source of revenue for governments in Canada since Confederation. For decades after Confederation tariffs and excise taxes accounted for virtually all of government revenue. Since the introduction of corporate and personal incomes taxes, the reliance on indirect levies has decreased, as has the type of indirect taxes relied upon, though they remain an important part of the revenue mix for federal and provincial governments in Canada. Of course, the vast majority of indirect tax revenues in Canada now come from sales taxes rather than tariffs and excise taxes.

Of the ten provinces, only Alberta does not have a provincial sales tax. Of the nine that do, five (as of July 1, 2010) have combined their taxes with the federal government’s VAT (value-added tax)-style Goods and Services Tax (GST) and employ

the VAT-style Harmonized Sales Tax (HST), administered by the federal government. One other, Quebec, has largely harmonized its VAT-style Quebec Sales Tax (QST) with the federal government's GST, but the Quebec government administers both the QST and GST. The three remaining provinces – Saskatchewan, Manitoba, and Prince Edward Island – levy a RST (retail sales tax)-style Provincial Sales Tax (PST) that they each administer separately.

So, in addition to the VAT-style GST levied across the country, six of the nine Canadian provinces that employ general sales taxes also use a VAT-style tax, and for good reason; the economics literature is quite clear on the superiority of VATs over RSTs, both on efficiency and compliance fronts. Broad-based VATs avoid the tax cascading problems that plague RST systems and ensure that essentially all producers face the same effective prices on inputs. Indeed, empirical research by Murrell and Yu (2005) has shown that there is evidence of welfare-enhancing price-level decreases resulting from the elimination of tax cascading in Canadian provinces that have moved from RSTs to a VAT. Smart and Bird (2007) show that there was increased investment in machinery and equipment resulting from the same move. Further, the VAT has been empirically estimated to have a lower deadweight-loss than any other of the federal government's major sources of revenue (Baylor and Beauséjour 2004). It should also encourage compliance through its invoicing and crediting approach and, because of its broad base, diversifies enforcement risk systems that heavily rely on income taxes (like Canada's), bringing into the tax net agents who might otherwise escape taxation because of income concealment (Boadway et al. 1994).

But while these main arguments are relatively well-known, other – related, though perhaps secondary in concern – sales tax issues have had much less attention in the literature and the public discourse. Another result of moving from an RST to a VAT may be changing the levels of sales tax evasion, which is the main focus of this paper. As sales taxes become more heavily relied upon by governments the level of sales tax evasion naturally becomes a more relevant discussion.

According to former Prime Minister Brian Mulroney, whose government replaced the former hidden Manufacturers' Sales Tax (MST), levied at the wholesale level, with the VAT-style GST in 1991, reducing the level of sales tax evasion was one of the objectives behind the change: “(the) MST was a hidden tax and leaky as a sieve! When retail sales were rising in the late 1980s, revenues from the MST were unpredictable at best and falling at worst. Things were so bad that the tax had become sort of voluntary; a manufacturer collected it from his customer only if he couldn't figure out a way to avoid it” (Mulroney 2007, 823). While this paper does not compare evasion under the MST to the GST, as the comparison is much more difficult to make given their fundamentally different designs, surely minimizing sales tax evasion remains an important goal for governments today, even though it has not been a major part of the recent debates about sales tax harmonization in Canada.

There are a number of potential sources of sales tax evasion, including but not limited to: registered businesses under-reporting sales (with or without the knowledge of consumers); businesses large enough to register failing to do so; firms misclassifying sales into a category subject to a lower rate of tax; and consumers and firms importing goods from other jurisdictions and not declaring them to the tax authorities.

In theory, because of the VAT crediting system's 'paper trail' for taxes paid on intermediate goods and the broader base that allows for a lower rate and fewer goods and services exempt, the conventional wisdom is that switching from an RST to a VAT would reduce the scope for sales tax evasion. Indeed, the Government of Canada suggested this expected effect during its promotion of the HST in the late 1990s. Conversely, it has also been claimed that the introduction of the VAT-style GST in Canada in 1991 led to an *increase* in tax evasion, which was reflected in rising estimates of the size of the Canadian underground economy over the 1990s (Tedds 2005). In fact, Tedds asserts that it is often argued that broadening the base and shortening the list of exemptions may increase the incentives and opportunities for tax evasion, which seems to have some empirical support (Spiro 1993).

Indeed, a VAT has additional sources of evasion to those mentioned previously, particularly input-credit fraud such as 'carousel fraud' or the construction of business activities relating to zero-rated goods that are due refunds of input VAT with the purpose of defrauding the government. In fact, carousel fraud is thought to have been behind a rise of VAT revenue losses of one-third in the UK in the early 1990s. Crawford et al. (2009) describe a simple example of carousel fraud:

“Two key features of the VAT that this exploits are the zero-rating of exports and the system of 'deferred payment' for VAT on imports... Under deferred payment, VAT on imports from one member state into another is levied not at the border but at the time of the importer's next periodic VAT return. As a result, there may be a considerable time lag between the date at which the importing firm (Company B in the example) brings the goods into the UK and the time at which the VAT authorities seek payment of the VAT due. In the meantime, the goods are sold on, via complicit – or perhaps unwitting – 'buffer' companies in the UK, to Company D, which exports the goods, claiming a refund of the VAT paid when it purchased the goods from Company C... the exported goods are then re-imported by Company B – or more likely a new firm, B having gone missing – and so on, following a cycle in which VAT refunds are claimed repeatedly

whenever the goods are exported, while the corresponding import VAT liability accumulates but is never paid.”

While this situation is at least partly facilitated by Europe’s large number of developed economies with very similar VAT regimes within a small geographical area, as well as the policy of deferred payment, which makes it unlikely that fraud to the same extent would occur between, say, Canada and the United States, it does speak to the potential for new and large-scale evasion possibilities under a VAT.

Combined, all the potential sources contribute to governments not receiving the ‘full’ amount of tax revenue that they should collect. This paper does not attempt to investigate the incidence or magnitude of each potential source, but it does attempt to estimate the combined total sales tax evasion in each Canadian province from 1991 to 2007, and particularly if evasion is higher under a RST regime or a VAT regime.

There is a substantial body of literature on topics closely related to sales tax evasion. Much work has been done on the size of the entire shadow economy - those (often illegal) economic activities and the income derived from them that operate outside of the formal economy and circumvent or otherwise avoid government regulation, taxation or observation – as well as evasion, which deals more with activities done *within* the formal economy. The empirical literature in these areas has focused on a number of, principally developed, countries across the world, including Canada. There are a number of methods that researchers have used over the many years of work on the issue of evasion and the shadow economy and, according to Schneider (2010), while there is not a consensus on the best method for all contexts, the numerous methods can largely be categorized into several general approaches:

- direct procedures at a micro-level that aim to determine the magnitude at one

- particular point in time, often based on surveys of taxpayers and tax auditing
- indirect procedures that make use of macroeconomic indicators like national accounts and money demand to estimate development over time
 - statistical models, such as dynamic multiple-indicator and multiple-causes (MIMIC) econometric models, that use statistical tools to estimate – for example, the shadow economy – as an ‘unobserved’ variable

Of course, each type of approach has advantages and disadvantages vis-à-vis the others and the optimal choice of which method to use at least partly depends on the issue at hand. For example, studies that focus on the size of the entire shadow economy often use methods that fall into the statistical models category because the nature of shadow economy activities are such that finding direct observable data is very difficult, as the actions are outside of the formal economy that can be directly measured, and the most accurate estimations can be made with a sophisticated econometric model using indirect data sources. For example, the money demand method, which is commonly used to estimate the size of the shadow economy, uses econometric estimates of the demand for currency to estimate the amount of currency held by economic agents in excess of the amount they need to make registered transactions. This excess of currency multiplied by the income-velocity of circulation (generally assumed to be equal in the registered and shadow economies) to give a measure of the hidden GDP (Ahumada et al. 2006).

Work on income tax evasion often uses direct micro-level procedures like face-to-face interviews and tax audits because of the accuracy of such methods, but these are costly and difficult to implement on a large scale. Indirect procedures that use

macroeconomic aggregates like national accounts are generally used for evasion rather than shadow economy studies because the agents involved in evasion generally engage in the formal economy to a large extent and so at least some of their actions will turn up in directly measured data. For example, estimates of GDP based on reported expenditures are more accurate than estimates of GDP based on reported income if some businesses hide some of their sales from the government, and so studies – like this one – that try to estimate evasion can use the appropriate estimate of GDP. For such indirect procedures, there is often directly relevant, if not direct (evasion, for example, is not observed by revenue authorities by definition) data readily available which can be used to make aggregate estimates that are quite precise.

But notwithstanding the array of different circumstances and methods used, a number of general results have emerged. Researchers identify tax burdens (particularly at the margin), tax morale, complexity of the tax system, intensity of government regulation, and quality of public services and institutions as factors that can predict to a high degree the level of evasion and activity in shadow economies (Schneider 2000, Feld and Schneider 2010).

While enforcement and deterrence command a large focus in the theoretical literature, indirect and direct tax burdens are generally empirically estimated to have the highest impact on the level of tax evasion in an economy. The higher the amount of tax consumers have to pay (especially at the margin), the higher the incentive to evade paying tax, or the lower the willingness to pay tax (tax morale), becomes. This, combined with the normal effect of higher taxes raising the prices of good, either directly or by shifting in the budget line, accounts for the total changes to tax revenues relating to

policy changes, generally referred to as tax revenue elasticity. Modern work on tax revenue elasticity – how tax rates or burdens affect government revenues – usually still references the Laffer curve and at least implicitly accounts for evasion. Indeed, in their study of corporate income tax revenue elasticity, Creedy and Gemmell (2008) state that tax revenue authorities have found it increasingly difficult to provide reliable forecasts of corporation taxes, even when given reasonably accurate projections of profits, because of a combination of factors including how discretionary changes in tax rates interacts with changes in avoidance and evasion, which their model attempts to incorporate. In the context of sales tax harmonization, where much of the tax burden shifts¹ from businesses to consumers, it is likely that evasion by firms would decrease while evasion by consumers would increase, though the net effect is not obvious.

A related issue is tax salience (awareness or attention to the amount of tax to be paid on a good), and specifically the difference between purchase behaviour of goods and services with tax-inclusive and -exclusive prices. The lessons of Chetty et al. (2009) and others in this burgeoning area of the literature, that tax salience affects behavioral responses by individuals, is important not only for optimal taxation design but may also aid in understanding tax evasion. In the Canadian context, in which posted prices are not tax-inclusive, unlike essentially anywhere else in the world, salience is even more relevant. The extra ‘visibility’ of sales taxes in Canada, when customers find out at the cash register that they are paying extra for their goods rather than knowing the full prices ahead of time, may lead to a larger perceived burden and therefore more evasion.

¹ In 2005, the Saskatchewan Business Income Tax Review Commission estimated a move from the PST to the HST would increase the burden for consumers from 41% to 82% of sales tax revenues collected.

Certainly in the past this extra visibility of sales taxes in Canada has been seen as a key driver of the visceral dislike Canadians, on average, have had for the GST since its introduction in 1991. Brought in to replace the hidden MST, the GST was largely seen as a new, additional, and very visible, tax. Going one step further to the HST, with its broader tax base and consequently larger surprise at the cash register, not to mention the higher proportion of the tax paid by consumers relative to the PST, may further increase this visibility and perceived burden.

In addition to the burden of the tax system, the complexity of it is also alleged to affect the level of tax evasion in an economy. The simpler rules are for paying tax, the easier it is to notice when taxes are not being paid and the higher the risk of operating outside of the official economy. In this regard, since there are fewer exemptions under the GST than the PSTs, sales tax harmonization may reduce the amount of evasion from the complexity driver, although some contend that the fewer exemptions drive people who would normally seek out goods with exemptions to evade altogether, as mentioned previously.

Confidence in government and public institutions also has a notable impact on evasion, according to Feld and Frey (2007). In addition to the obvious tendencies of countries with strong rule of law to have smaller shadow economies and less evasion, disapproval of government actions and/or spending reduces taxpayers' willingness to pay, or tax morale. The greater the value of services taxpayers feel they receive in exchange for their tax dollars, the more willing they are to contribute to tax revenues. Conversely, the more taxpayers disapprove of actions that governments have taken on tax policy, as many Canadians did after the introduction of the GST and as many British

Columbians do at present since the Campbell government's announcement of sales tax harmonization in BC very soon after denying that very intention in an election campaign, the more they may try to evade paying taxes.

The combined effect of these drivers is what is often measured empirically. In Canada, the size of the shadow economy is estimated to be relatively low and to have decreased in recent years; it dropped from 16.2% of official GDP in 1997/1998 to 12.6% in 2007, when the OECD average was 13.9% (Schneider 2010). However, Tedds (2005) estimates that the longer-term trend is a steady increase, and that the size of the shadow economy as a proportion of official GDP increased from 7.9% in 1976 to 16% in 2001.

While estimating the total amount of (legal and illegal) economic activity that has evaded government observation is undoubtedly useful, and has been the primary focus of research done in the evasion/underground economy field, it does not allow us to track evasion of specific taxes, something that would be of use to policymakers as they consider specific tax changes. This requires a slightly different approach.

This paper aims to estimate federal and provincial sales tax evasion in each of the Canadian provinces to ascertain if there is a difference in evasion under RSTs compared to a VAT. A closely-related previous study estimated VAT evasion in the European Union and found a wide range of outcomes, from a three-year average of 2.4% in the Netherlands to 34.5% in Italy (Nam et al. 2001). Following the general approach of this previous study, from expenditure-based GDP estimates I apply the appropriate tax rates to a number of types of spending in each province to ascertain the 'hypothetical' revenues that should have been raised and compare them to the actual revenues collected to estimate the amount of sales tax evasion in each province.

$$(1) \quad \text{Tax collection ratio} \quad = \quad \frac{\text{Collected revenues}}{\text{Calculated hypothetical revenues}}$$

$$(2) \quad \text{Ratio of VAT evasion} \quad = \quad 1 - \text{Tax collection ratio}$$

This approach is largely described by Tedds (2005) as the National Accounts/Judgmental Method, one that involves no formal ‘modeling’ of the underground economy, but instead rests on a detailed breakdown of either the expenditure or income side of the national accounts into its component parts, and the application of subjective judgments. Where it is possible I use data directly from the national and provincial accounts to make my estimates; where it is not possible I utilize other related data sources to make educated judgements on likely levels of spending on certain types of goods.

Some data is not directly available, so will I use related data to estimate some things. For example, because comprehensive input-output data is not available by province, I will estimate a weighted average of taxable goods in each province to estimate the number of imports to a province that should be taxable. Also, even though exports are supposed to be zero-rated, it is likely that some embedded tax is worked into some of these items, particularly exempt ones. To address this, I will assume 5% of exports are taxable.

The base data for my calculations is annual expenditure-based provincial GDP estimates from Statistics Canada (Table 384-0002). This data breaks down provincial GDP into the regular four categories: personal expenditure, government spending, investment, and exports and imports (or, $C+I+G+[X-M]$). These four categories are also disaggregated into a number of subcategories; for example, investment is broken down

into fixed capital and inventory and into private sector and government. To disaggregate some categories even further I will make use of other datasets such as Statistics Canada's annual Survey of Household Spending which will allow me to get a much more detailed look at what kinds of things are being purchased in each province, and consequently get much more precise estimates of sales tax evasion. Unfortunately, this data only goes as far back as 1997 and so in my provincial estimates I must assume that individuals spent in the same way from 1991-1996 as they did in 1997. The data from 1997 onward suggests that spending patterns are quite stable across years so while the missing data before 1997 is regrettable, it is unlikely to be a major problem. To be sure, and to more generally test my method before getting to estimates by province, I will first make two different estimates of national GST evasion, my so-called first- and second-pass estimates.

2 Estimating federal sales tax evasion

The GST/HST/QST has a relatively straightforward list² of things that receive special treatment. As expected under a broad-based tax, most things are subject to the full GST/HST; however, some are zero-rated (no tax is collected on the final sale and sellers can claim input tax credits on their purchases), including:

- Basic groceries (not snack foods, non-fruit beverages, prepared foods, restaurant meals)
- Prescription drugs and medical devices
- Exports
- Purchases by provincial and territorial governments, First Nations, and diplomats

² Information on the specificities of different tax treatments of goods and buyers and sellers, in this section and the next, is taken principally from the Canadian Tax Foundation's annual Finances of the Nation (or before 1995, The National Finances).

- Sales by farmers

Some others are exempt (no tax is collected on the final sales but no input tax credits can be claimed by the seller), including:

- Sales made by small traders and private individuals
- Residential rents
- Health and dental services
- Financial services
- Day-care
- Municipal transit
- Educational services
- Resale of old homes
- New homes (partial exemption)

In addition, the so-called MUSH (municipalities, universities, schools, and public hospitals) sector gets partial rebates on its purchases, and specifically:

- Municipalities, 57.14% (100% as of 2004)
- Universities and public colleges, 67%
- Schools, 68%
- Public hospitals, 83%
- Non-profits, 50%

Using the disaggregated annual national expenditure-based GDP data, for each category of spending I will apply an estimate of how much of that category is fully taxable, how much is zero-rated, how much is exempt, etc. to get the proportion of the category that is taxable. For example, from the data I know how much of what people spent in a year was spent on food, and of that how much was spent in restaurants and in stores, and of that can estimate³ how much should have been zero-rated and how much was taxable. I will take each proportion and multiply it by the corresponding amount of GDP in that category and add all those products up to get the estimated tax base (see

³ Based on regional averages of household spending in stores in 2001 from Statistics Canada's Food Expenditures in Canada (2003)

Appendix 1 for a visual aid of how I calculate my second pass-described in more detail below).

Because some sales tax should be collected on exempt goods (while the final sale is not taxable, credit cannot be claimed for taxes paid on inputs) I treat these goods as 26-40% taxable, depending on the year. This is based on annual national figures published by the Canadian Tax Foundation of the proportion of gross collections that remain after refunds and credits (including GST tax credits and rebates to the MUSH sector, for example, so I have reduced the number by the portion of GST tax credits plus 5% each year to account for this) are paid out which I use as a proxy for how much value of a good, on average, is added⁴ before the last stage and is therefore taxable. I use the same (but not reduced) proportion for its directly relevant purpose: to reduce the gross collections I calculate by applying the appropriate weighted tax rate against each category of spending in the economy by how much the government actually paid out from the same pot in credits and rebates. I further decrease the hypothetical revenues by 1% each for bankruptcies (as Nam did) and the amount of purchases from small traders.

As a first-pass calculation, I apply the GST rate, adjusted to $r/(1+r)$ because the data is tax-inclusive, against the national base using Statistics Canada's estimate of annual national personal expenditures, usefully broken down into a number of spending areas. Because the direct data on personal expenditures is available nationally I do not need to use the data from household spending to approximate it in the first-pass.

This first-pass will allow me to do two things. First, it will give me an estimate of annual aggregate GST evasion in Canada to compare it to the range found in the Nam

⁴ I treat like zero-rated goods spending on services like educational tuition where there are not likely many stages of value-adding or those accounted for by credits and refunds like tax on new homes.

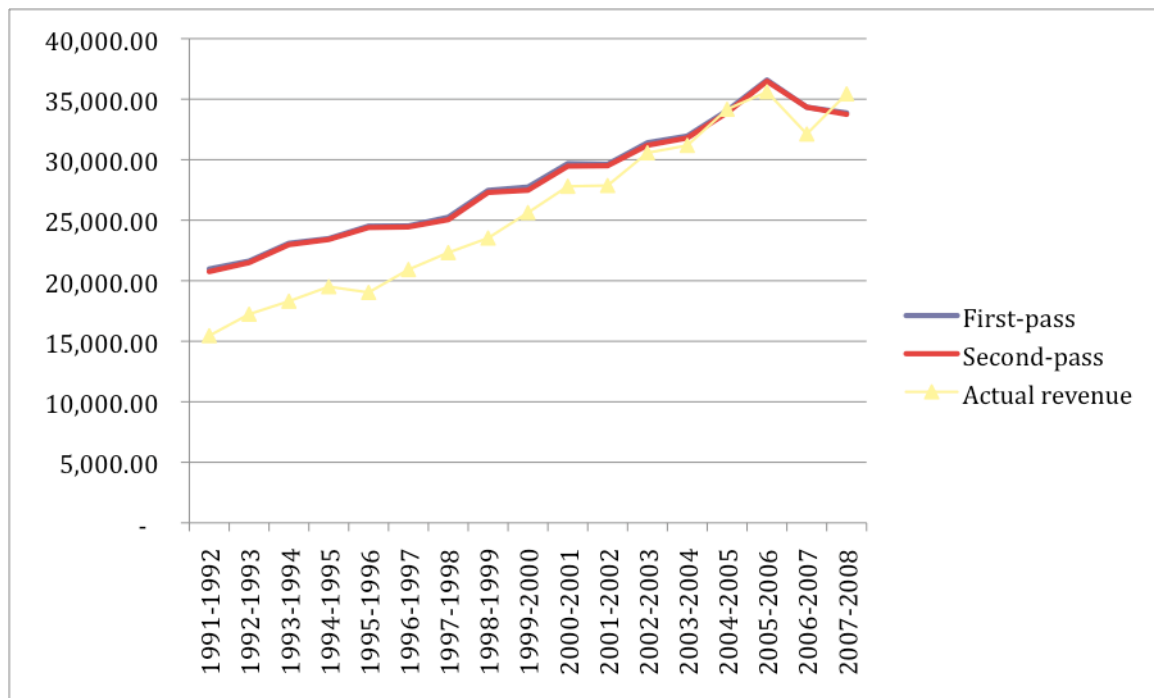
study. As the UK and other European countries most similar to Canada in the world were estimated to have relatively low levels of sales tax evasion, finding high levels of evasion could be an early indication that direct international comparisons using the estimates from the Nam et al. study may not be possible, but would not necessarily be surprising given the very general information about the methodology in that paper. In any case, while it is not so much necessarily the *level of*, as it is the *change in*, the level of sales tax evasion in each province that I am interested in, it is nonetheless important for the estimates to be believable.

Second, this first-pass estimate will enable me to test my approximation process of using related data for each province. I will run a second-pass estimate using aggregate national data but with the personal expenditures proxy that I will utilize with provincial data and see if the two estimates of the same thing are similar. Because the personal expenditure data is created from a number of sources, including but not limited to the Survey on Household Spending, there is a risk that using Survey on Household Spending as a proxy for personal expenditure will not give an accurate estimation. Moreover, the household spending data is only available for 1997 onward. However, this proxy does have one important redeeming quality: because the Survey on Household Spending gives a much more detailed breakdown of each category of spending, it should enable me to get a more precise estimate of evasion than the Personal Expenditure data would, particularly later when I estimate evasion provincially, where all of the data used in the first-pass is not available.

On the second purpose, I find that using household spending survey data can serve as a very good proxy for Personal Expenditures and that the missing data on

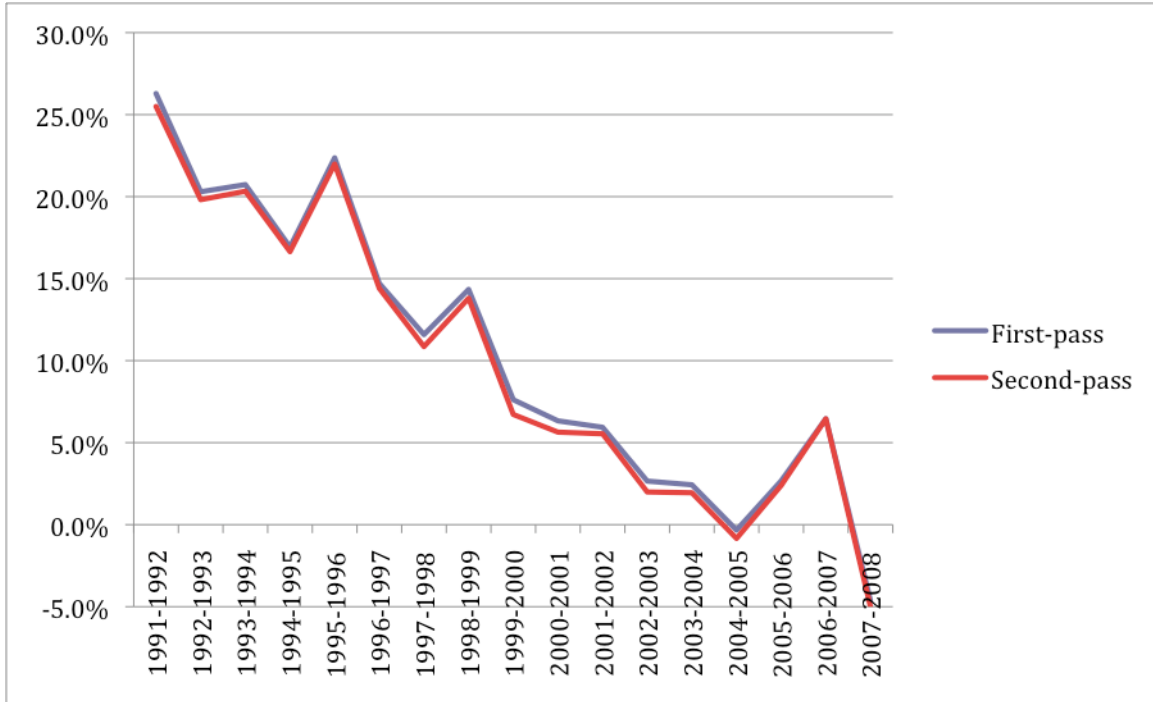
household spending prior to 1997 seems not to be a major reason for concern, as the first- and second-pass estimates are almost identical (seen below in Figure 1).

Figure 1: First-pass estimate, second-pass estimate, and actual revenue



On the first purpose, both the first- and second-pass provide me with estimates (seen below in Figure 2) of annual national GST evasion between -5% and 26%, indicating that my method is likely relatively similar to the one used by Nam et al., although the negative estimates indicate that my method is not perfect. Also, while Nam’s estimates for each country certainly did not have a range of 31%, that study only had estimates for three years so the longer-term trends are not available to compare to directly. However, the average three-year range in my calculations is under 3% compared to an average range of 3.2% over three years in the Nam et al. study, indicating that they may be more comparable than at first glance.

Figure 2: Estimates of annual national GST evasion

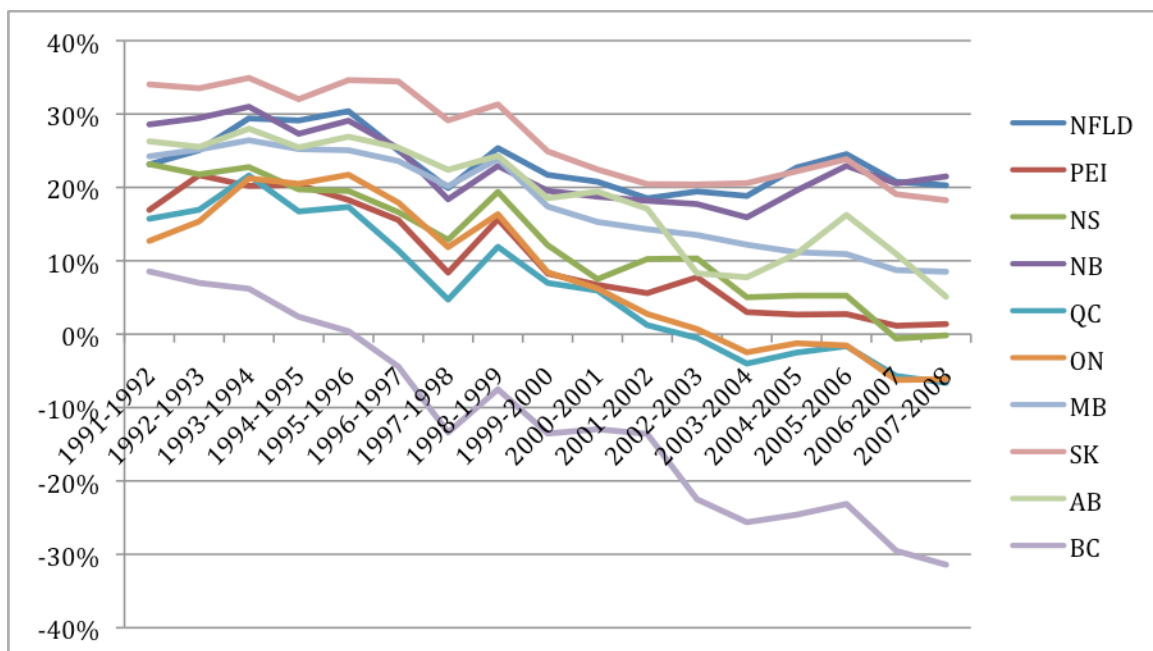


While 26% in fiscal 1991 certainly seems high at first glance, as it puts Canada in the same area as Europe’s worst sales tax evaders (if one is assuming that Nam’s methodology was very similar to mine), it was known that MST evasion was quite high in the years immediately prior to the introduction of the GST so the initial high level of evasion is really not that surprising. Another explanation – related to the aforementioned drivers of evasion – is that GST evasion was highest when the GST was first introduced because the public rage against it was highest at that time, and compliance has increased as public rage against it wore off. The decrease over the past decade may also have been fuelled by a lower tax burden as governments cut taxes. While difficult to prove, widespread concern over government spending (drop in confidence in government) related to the fallout from the Gomery Commission coincided with the period of rising

estimated GST evasion from 2004-2006 and the sharp drop from 2006-2008 coincided with the only sales tax cuts (drop in direct tax burden), two things that possibly help explain the changing levels of estimated evasion in recent years.

With my method tested and estimates found to be generally believable, and my proxy found to be quite accurate, I next move to estimate GST evasion (seen below in Figure 3 and listed in Appendix 2) in each province using the same method as I did in the second-pass, but with provincial data.

Figure 3: Estimates of annual GST evasion by province



Individually, the provincial estimates are less accurate than the aggregate estimate, because while most of the important data is available by province (for example, the GST revenue raised in each province comes from Table 12 of the Provincial and Territorial Economic Accounts), some is not. And while some of the missing data can be

reasonably well approximated (for example, the amount of GST tax credits paid out in each province can be estimated with income distribution data), some cannot be. For example, determining the amount of input tax credits refunded to each province is not possible. As a result, we get the situation where the evasion estimates of some of the provinces enter the negative territory, indicating that the estimates are likely not completely accurate and so direct comparisons across provinces may not be possible. If more data was available, for example on the distribution of input tax credits and the value of credits received from zero-rated exports in each area, each province's estimate would likely be shifted up or down depending on its position relative to the national average. Unless the province's economy significantly altered in composition from 1991-2007, the change in the provincial trends should be more of a vertical than horizontal change. While certain differences between provinces – like compositions of industry, income levels, levels of tax morale, etc. – would naturally create different levels of tax evasion between provinces, the true levels across provinces are likely closer to one another than the estimate above implies and although each of the provincial GST evasion estimates are not fully accurate, they should be quite precise in terms of tracking changing levels of evasion from year-to-year.

3 Estimating provincial sales tax evasion

For the provincial estimates I will follow the same method as I used for the second-pass, in which I (primarily but not exclusively) use data on household spending to proxy personal expenditures. With regards to the Provincial Sales Taxes that exist, the list of things that get special treatment is longer, and vary from province to province to some

extent. However, there are a number of things that are generally exempt from PST, including:

- Services, except for:
 - Telecommunication services
 - Hotel and motel accommodation
 - Prepackaged computer software
 - Labour services relating to personal property
 - Insurance premiums
- Food
- Prescription drugs and medical appliances
- Most books
- Children's clothing
- Alcohol⁵
- Magazines and periodicals
- Farm machinery and equipment, farm products, crops, livestock, feed, etc
- Production machinery
- Production consumables
- Processing materials
- Products used directly in the production process
- Some exemptions for municipalities

Clearly, the list of exempt goods is much larger than that for the GST/HST. The PSTs also have a large number of exemptions specific to each province, which I have done my best to do try to identify and incorporate into my estimates.

And again, because of the detailed Survey of Household Spending data, fortunately it is possible to identify the amount of spending in each province on each of these goods. The other categories of GDP again have less detailed data, but they are broken down enough for me to be able to apply the available information and make educated inferences about PST treatment to non-personal expenditures. For example, I treat investment in machinery and capital as non-taxable in those provinces that it is and

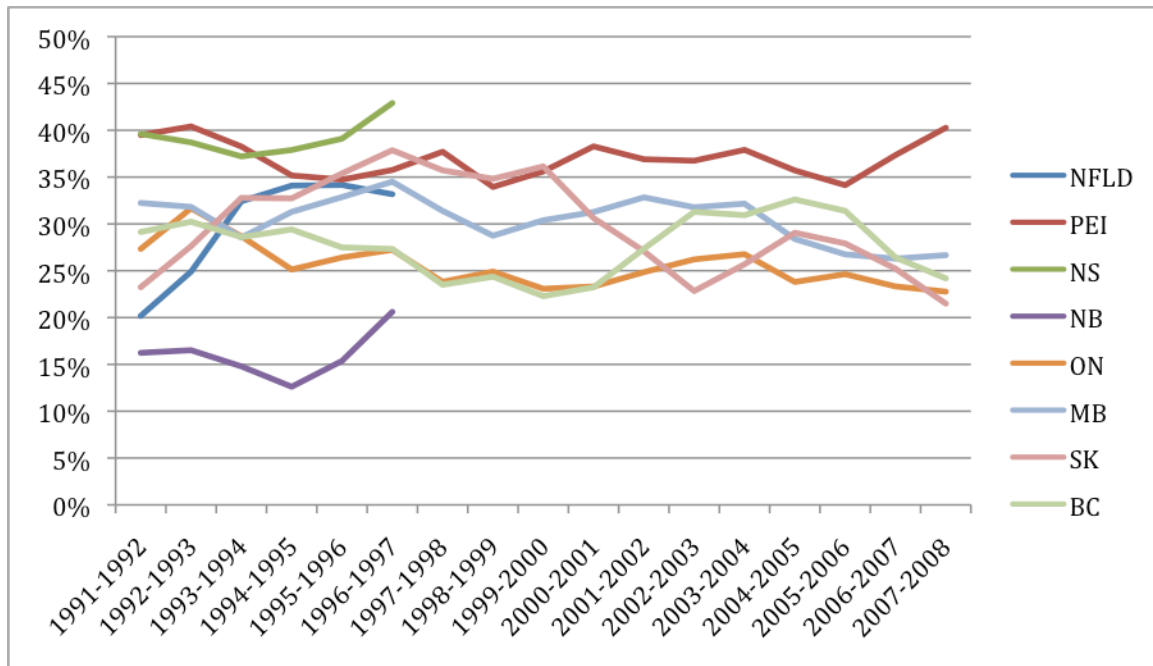
⁵ Generally, goods like alcohol and gasoline which are taxed under separate statutory provisions are exempt from sales tax

treat inventories as 50% taxable in those provinces in which production consumables are exempt.

Because the PSTs are single-stage taxes and do not involve input tax credits, nearly all of the gross collections should remain as net revenues. I again reduce the tax base by 1% each for small traders and bankruptcies as well as 1% further to account for the small percentage of revenue that provinces allow retailers to keep in compensation of their role as tax-collectors. It is important to note that east of Ontario PST is collected on the GST-inclusive prices, making their 'effective' rates slightly higher than the nominal ones. As well, since the expenditure-based GDP data is again inclusive of taxes paid, it is necessary to adjust these 'effective' tax rates to $r/(1+r)$.

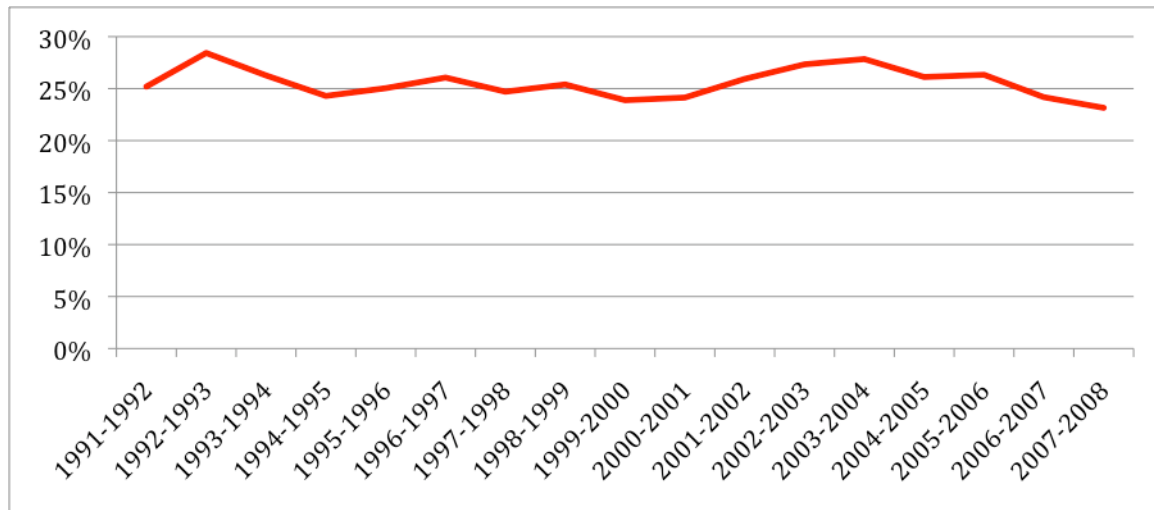
For those three provinces that harmonized in 1997, I estimate evasion under their PSTs from 1991-1996. Since the federal government administers the HST and sends provinces their share of the revenues, the provincial sales tax evasion in those provinces must be the same as GST evasion from 1997 onward. Since Quebec has not had an RST for essentially the entire time period on which I am focusing (and has largely harmonized its sales tax with the GST for most of the period) I do not make a provincial estimate for that province. For those provinces that had PSTs from fiscal 1991-2007, I estimate the entire period (seen below in Figure 4 and listed in Appendix 3).

Figure 4: Estimates of PST evasion by province



Because of the lack of necessary data at the provincial level, direct comparisons of PST and GST evasion in each province are not wholly appropriate, though for reference they are featured in Appendix 4. And while systematic differences across provinces are normal given different tax burdens and morale as well as compositions of output, overall trends seem to imply fairly steady levels of PST evasion over time, perhaps because the PSTs were not new in 1991 and there was no major public outcry against them so perhaps evasion behaviour had reached a sort of steady-state. Indeed, taking a weighted average (by size of provincial GDP) gives me an estimate of aggregate provincial sales tax evasion (seen below in Figure 5) that seems to indicate that there has been little or no decrease in PST evasion since 1991 even though the level of evasion is non-trivial.

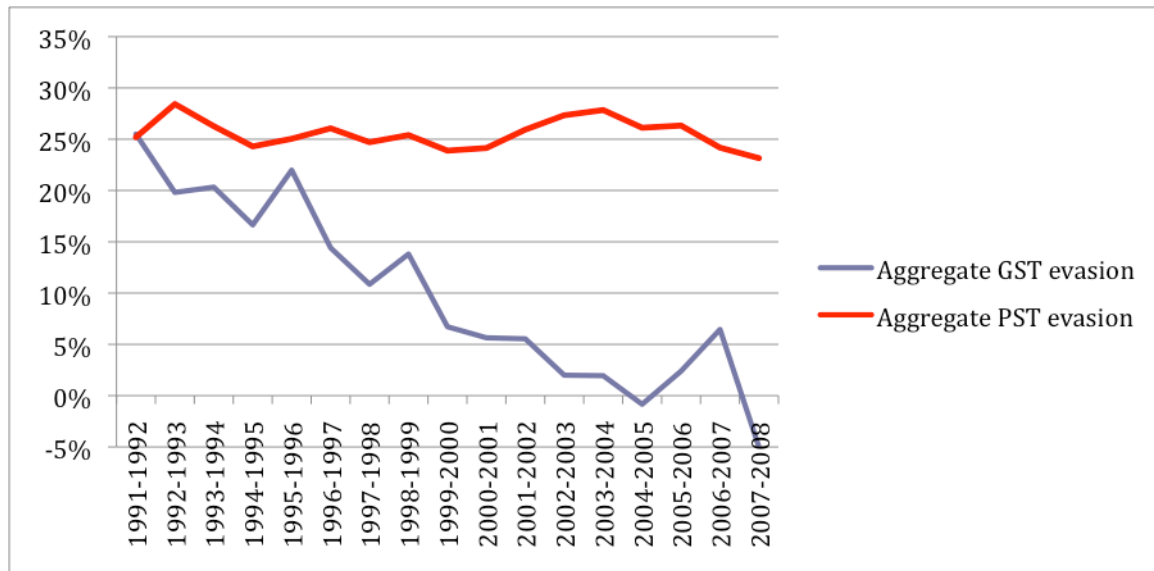
Figure 5: Estimate of aggregate PST evasion



4 Comparison

Ideally, there would be sufficient data to rigorously test evasion in each of the three maritime provinces that harmonized in 1997 before and since harmonization to test the hypothesis that VATs have lower evasion than RSTs because of the aforementioned reasons, including the paper trail and incentive for firms to report to receive their input tax credits as well as the broader base which make avoiding paying tax more conspicuous. Unfortunately the limitations associated with making estimates at the provincial level, and in particular the unavailable data on GST credits and refunds in each province that make the GST evasion estimates by province somewhat inaccurate, make that difficult to do. Another, more general way, to compare evasion under both types of regimes are to simply to compare the aggregate GST evasion estimates to the aggregate PST estimate if there is a clear trend. Fortunately, there is in this case (as seen below in Figure 6).

Figure 6: Estimates of aggregate GST evasion and PST evasion



While this method may be not optimal, it does tell a believable story. VAT and RST evasion start at a similar level in 1991, as would be expected when moving to a new tax system. At first Canadians may have acted to the GST as they did to the tax that they were used to at the time, the PST, and so evasion of each was initially the same. But after starting at the same point, evasion of the two taxes diverged quickly, with VAT evasion falling quite quickly and steadily in comparison to RST evasion, as the conventional wisdom predicted.

In addition to the benefits from the GST’s paper trail and broad base, or the results expected by the convention wisdom relating to the theory of tax design, part of the difference may have to do practical or operational differences, like the ability to enforce certain policies. The Canadian Tax Foundation (1991) notes that: “In practice, the provinces have few mechanisms in place to enforce the tax on imports, unless, like automobiles, the goods must be registered by provincial authorities. In most cases, the

provinces rely on purchasers voluntarily reporting imports of taxable goods and remitting the appropriate tax.” Both theoretical and practical considerations likely contribute to why the federal GST is less evaded than the provincial PSTs in Canada.

5 Conclusion

While total tax evasion and the size of the underground economy have commanded some attention in the literature, evasion relating to sales tax alone has been given much less attention even though it has been a focus for policymakers and affecting levels of sales tax evasion can be a byproduct of sales tax harmonization. This paper follows the general method of a study of sales tax evasion in Europe to estimate evasion nationally and provincially in Canada and finds that GST evasion has fallen significantly since its introduction in 1991 and that PST evasion has declined much less, if any, over the same time period. While unavailable data at a sub-national level makes it difficult to test the hypothesis in the traditional way, the evidence from Canada since 1991 indicates that evasion is generally lower under a VAT than an RST.

As such, in addition to the benefits relating to economic efficiency that have been touted previously as reasons to harmonize, lower levels of tax evasion are likely to result from harmonizing sales taxes in the three remaining Canadian provinces with PSTs. Although sales tax revenues will likely fall in those provinces, as was the experience in the three provinces that harmonized in 1997 (Blagrove 2005), more consumers and businesses paying their fair share of taxes is hard to argue against. In fact, to address the disincentive of a likely drop in sales tax revenue, the federal government has recently been offering transitional funding assistance to provincial governments, making the

broader effects of greater profits for firms, lower prices for consumers and more jobs for workers – all stemming from of lower input costs for businesses – even more attractive. In the least, the expected result of lower evasion under the HST certainly makes the reform worthy of serious consideration by those governments.

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Appendix 1 – Estimate of national GST evasion, 1991 – 1996

	1991- 1992	1992- 1993	1993- 1994	1994- 1995	1995- 1996	1996- 1997
Canada(3) Total current consumption						
Canada(3) Food	29%	29%	30%	30%	30%	31%
Canada(3) Shelter	21%	21%	21%	21%	21%	21%
Canada(3) Household operation	87%	87%	87%	87%	87%	87%
Canada(3) Household furnishings and equipment	100%	100%	100%	100%	100%	100%
Canada(3) Clothing	100%	100%	100%	100%	100%	100%
Canada(3) Transportation	98%	98%	98%	99%	99%	99%
Canada(3) Health care	26%	26%	27%	30%	30%	32%
Canada(3) Personal care	100%	100%	100%	100%	100%	100%
Canada(3) Recreation	100%	100%	100%	100%	100%	100%
Canada(3) Reading materials and other printed matter	100%	100%	100%	100%	100%	100%
Canada(3) Education	32%	32%	32%	32%	32%	32%
Canada(3) Tobacco products and alcoholic beverages	100%	100%	100%	100%	100%	100%
Canada(3) Games of chance (net)	34%	34%	34%	34%	34%	34%
Canada(3) Miscellaneous expenditures	100%	100%	100%	100%	100%	100%
6 Net government current expenditure on goods and services	20%	20%	20%	20%	20%	20%
7 Government gross fixed capital formation	20%	20%	20%	20%	20%	20%
8 Structures						
9 Machinery and equipment						
10 Government investment in inventories	20%	20%	20%	20%	20%	20%
11 Business gross fixed capital formation						
12 Residential structures	100%	100%	100%	100%	100%	100%
13 Non-residential structures	100%	100%	100%	100%	100%	100%
14 Machinery and equipment	100%	100%	100%	100%	100%	100%
15 Business investment in inventories	100%	100%	100%	100%	100%	100%
16 Non-farm						
17 Farm						
18 Exports of goods and services	10%	10%	10%	10%	10%	10%
19 Exports to other countries						
20 Exports to other provinces						
21 Deduct: Imports of goods and services						
22 Imports from other countries	62%	62%	62%	62%	62%	62%
23 Imports from other provinces	62%	62%	62%	62%	62%	62%
24 Statistical discrepancy						
25 Gross Domestic Product at market prices						

(continued)

	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997
Canada(3) Total current consumption						
Canada(3) Food	18,745	19,660	20,750	21,853	22,936	24,342
Canada(3) Shelter	23,189	23,992	24,985	25,967	26,900	28,183
Canada(3) Household operation	22,683	23,468	24,440	25,400	26,313	27,567
Canada(3) Household furnishings and equipment	15,988	16,542	17,226	17,903	18,547	19,431
Canada(3) Clothing	24,856	25,716	26,781	27,833	28,834	30,208
Canada(3) Transportation	70,213	72,661	75,678	78,718	81,566	85,506
Canada(3) Health care	407	425	450	532	567	652
Canada(3) Personal care	7,592	7,854	8,180	8,501	8,806	9,226
Canada(3) Recreation	32,111	33,223	34,598	35,957	37,250	39,026
Canada(3) Reading materials and other printed matter	3,104	3,212	3,345	3,476	3,601	3,773
Canada(3) Education	2,523	2,610	2,718	2,825	2,927	3,066
Canada(3) Tobacco products and alcoholic beverages	9,201	9,520	9,914	10,303	10,674	11,183
Canada(3) Games of chance (net)	933	966	1,006	1,045	1,083	1,134
Canada(3) Miscellaneous expenditures	9,023	9,335	9,722	10,104	10,467	10,966
	240,569	249,185	259,793	270,416	280,471	294,264
6 Net government current expenditure on goods and services	32,774	33,876	34,254	34,361	34,427	34,262
7 Government gross fixed capital formation	4,037	3,984	4,052	4,315	4,240	4,093
10 Government investment in inventories	(8)	(6)	(1)	1	4	(0)
11 Business gross fixed capital formation						
12 Residential structures	37,592	39,844	40,355	40,851	36,987	40,533
13 Non-residential structures	33,960	29,789	31,145	34,169	35,092	38,238
14 Machinery and equipment	41,878	41,639	42,783	47,870	51,454	56,926
15 Business investment in inventories	(5,855)	(5,215)	(839)	2,646	7,317	3,747
18 Exports of goods and services	31,200	33,212	37,053	42,193	46,609	49,507
21 Deduct: Imports of goods and services						
22 Imports from other countries	111,043	122,969	140,923	160,475	173,396	185,689
23 Imports from other provinces	83,469	83,246	86,679	92,795	98,640	103,882
24 Statistical discrepancy	-	-	-	-	-	-
25 Gross Domestic Product at market prices	-	-	-	-	-	-
Estimated Tax Base	610,658	632,522	676,198	730,092	768,636	811,142
Minus						
Small firms/farmers	1%	1%	1%	1%	1%	1%
	604,551	626,197	669,436	722,791	760,950	803,030
Bankruptcies	1%	1%	1%	1%	1%	1%
Gross receipts	598,506	619,935	662,741	715,563	753,341	795,000
Refunds and credits	47%	47%	47%	50%	51%	53%
Estimated Net Tax Base	317,208	328,565	351,253	357,781	372,904	373,650
Hypothetical revenues	20,752	21,495	22,979	23,406	24,396	24,444
Collection ratio	75%	80%	80%	83%	78%	86%
Evasion ratio	25%	20%	20%	17%	22%	14%

Appendix 2 – Estimates of GST evasion by province

	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997
NFLD	23%	25%	29%	29%	30%	25%
PEI	17%	22%	20%	20%	18%	16%
NS	23%	22%	23%	20%	20%	17%
NB	29%	29%	31%	27%	29%	25%
QC	16%	17%	22%	17%	17%	11%
ON	13%	15%	21%	20%	22%	18%
MB	24%	25%	26%	25%	25%	24%
SK	34%	34%	35%	32%	35%	34%
AB	26%	26%	28%	25%	27%	25%
BC	9%	7%	6%	2%	0%	-4%

	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
NFLD	20%	25%	22%	21%	19%	19%
PEI	8%	16%	8%	7%	6%	8%
NS	13%	19%	12%	8%	10%	10%
NB	18%	23%	20%	19%	18%	18%
QC	5%	12%	7%	6%	1%	-1%
ON	12%	16%	8%	6%	3%	1%
MB	20%	24%	17%	15%	14%	14%
SK	29%	31%	25%	22%	20%	20%
AB	22%	24%	19%	19%	17%	8%
BC	-13%	-8%	-14%	-13%	-14%	-23%

	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
NFLD	19%	23%	25%	21%	20%
PEI	3%	3%	3%	1%	1%
NS	5%	5%	5%	-1%	0%
NB	16%	20%	23%	21%	21%
QC	-4%	-3%	-2%	-6%	-7%
ON	-2%	-1%	-2%	-6%	-6%
MB	12%	11%	11%	9%	9%
SK	21%	22%	24%	19%	18%
AB	8%	11%	16%	11%	5%
BC	-26%	-25%	-23%	-30%	-31%

Appendix 3 – Estimates of PST evasion by province

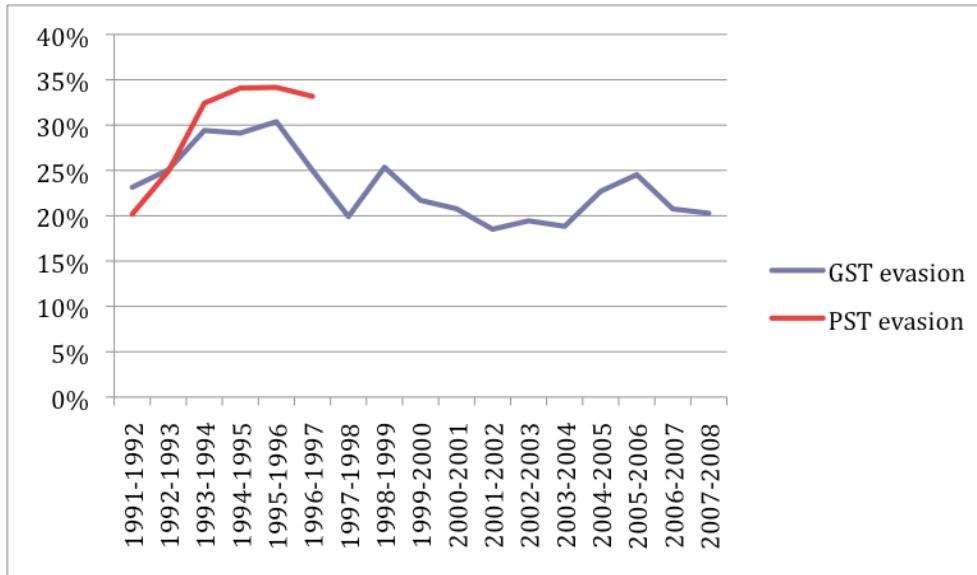
	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997
NFLD	20%	25%	32%	34%	34%	33%
PEI	37%	38%	36%	33%	33%	34%
NS	38%	37%	35%	36%	37%	41%
NB	14%	14%	12%	10%	13%	18%
ON	24%	28%	25%	21%	23%	24%
MB	29%	29%	25%	28%	30%	32%
SK	19%	24%	29%	29%	32%	35%
BC	29%	30%	29%	29%	27%	27%

	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
PEI	36%	31%	33%	36%	35%	34%
ON	24%	25%	23%	23%	25%	26%
MB	31%	29%	30%	31%	33%	32%
SK	32%	32%	33%	30%	27%	22%
BC	24%	24%	22%	23%	27%	31%

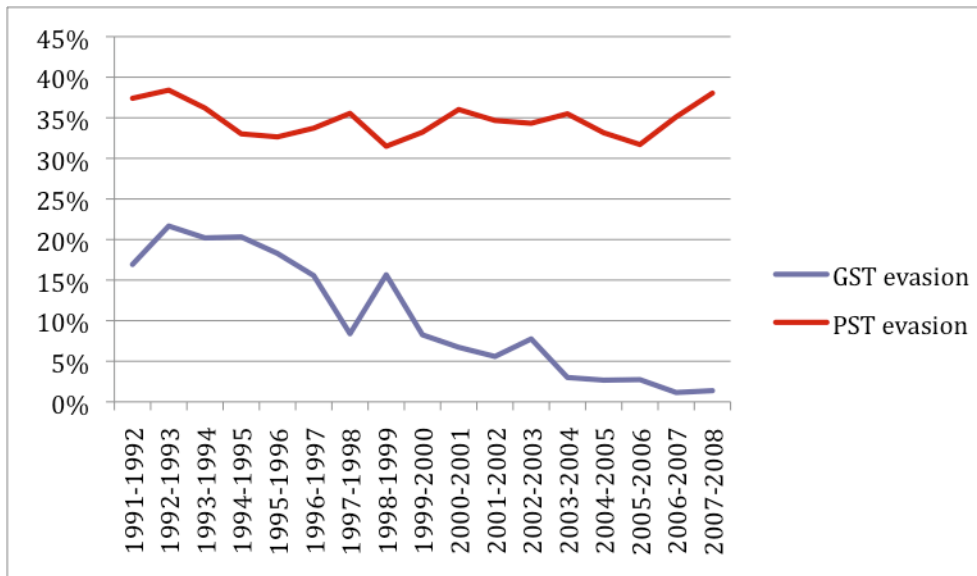
	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
PEI	35%	33%	32%	35%	38%
ON	27%	24%	25%	23%	23%
MB	32%	28%	27%	26%	27%
SK	25%	28%	27%	23%	19%
BC	31%	33%	31%	26%	24%

Appendix 4 – GST and PST evasion by province

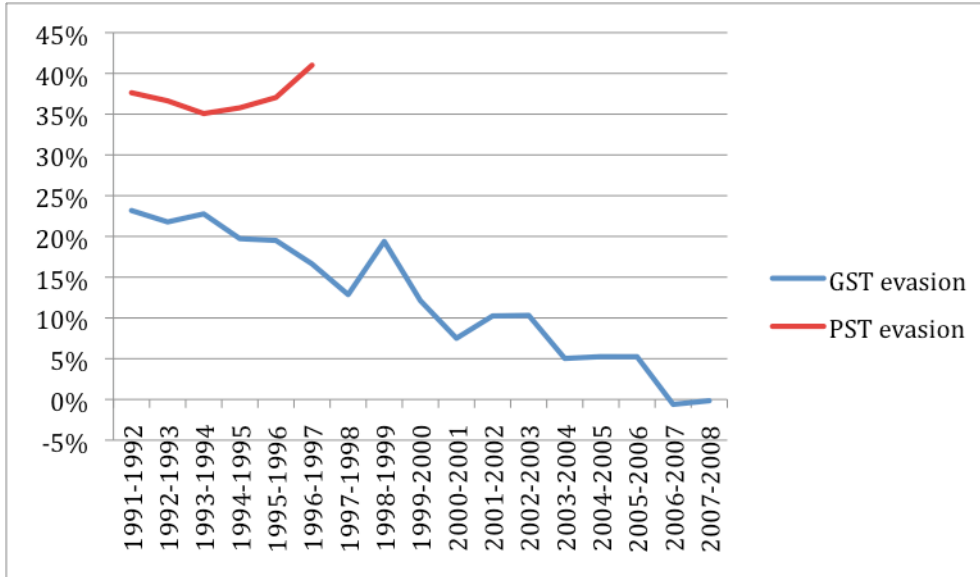
Newfoundland



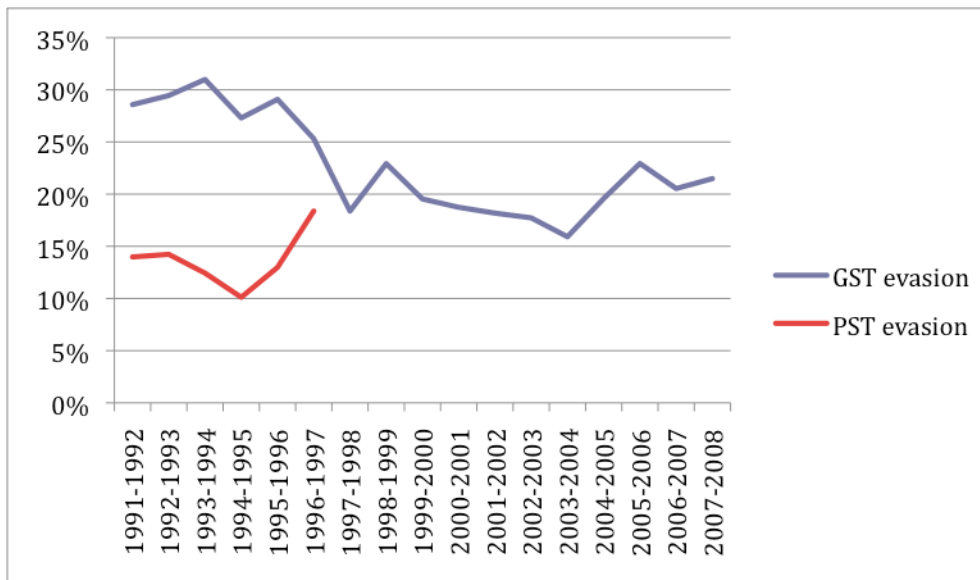
Prince Edward Island



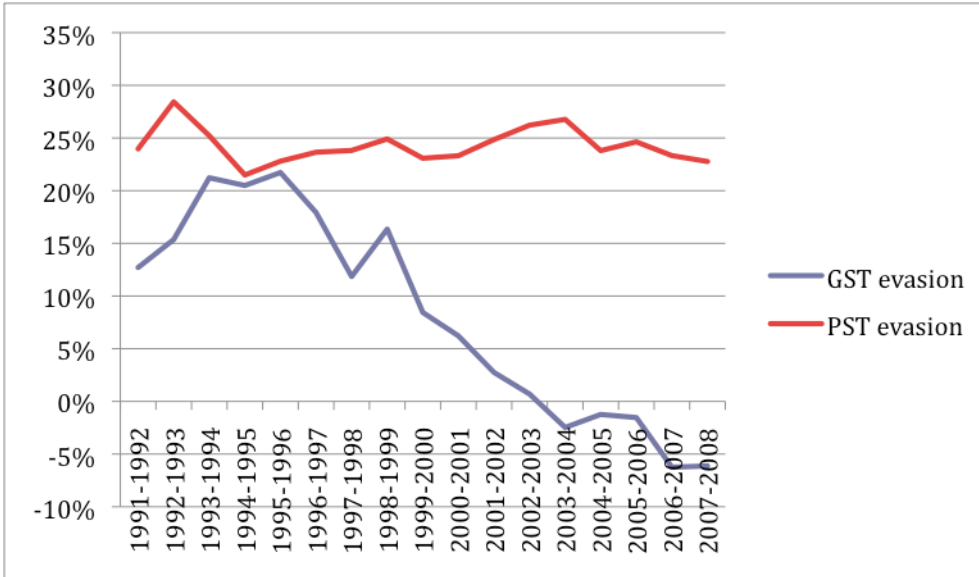
Nova Scotia



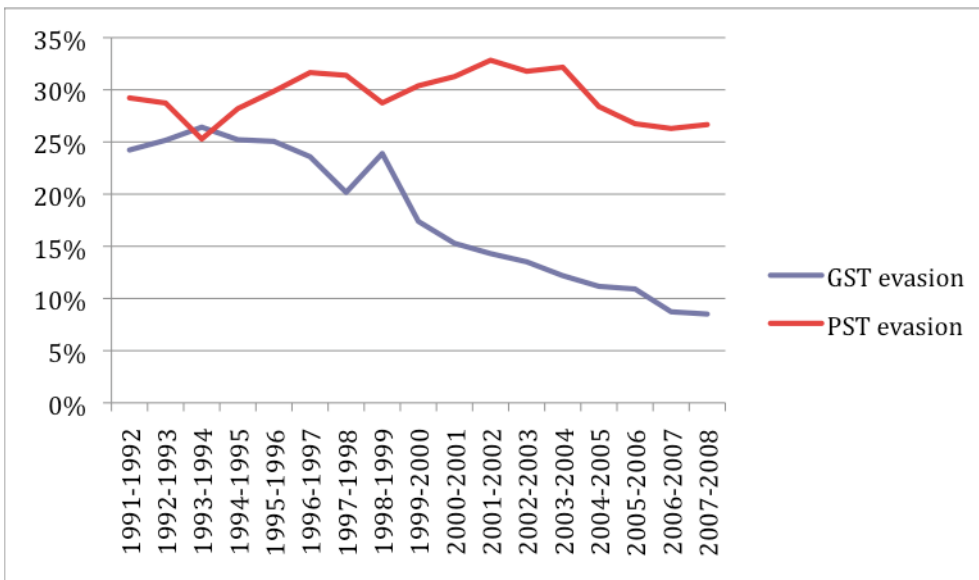
New Brunswick



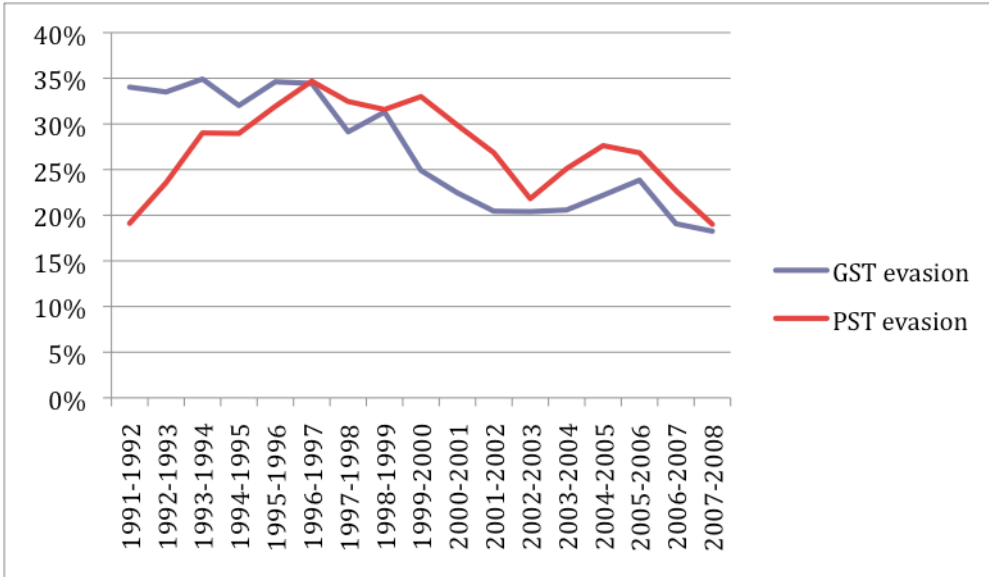
Ontario



Manitoba



Saskatchewan



British Columbia

