

# Estimating and Analyzing the Tax Gap

Related to the Goods and  
Services Tax/Harmonized Sales Tax



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# Introduction

This paper is an examination of the tax gap related to the Goods and Services Tax Harmonized Sales Tax (GST/HST). It includes a description of the underlying concepts, estimation methodology and an analysis of the results.

Tax gap estimates are widely viewed as an indicator of non-compliance. However, when analyzing tax gaps several considerations need to be kept in mind.

- First, tax gap estimates are only estimates. They are based on assumptions and depend on how well these assumptions reflect reality. Additionally, tax gap estimates are subject to errors in and revisions of the underlying data and estimates used.
- Second, while it is expected that the tax gap would be relatively stable from year-to-year, there can be volatility in the estimated measure of the tax gap which reflects the normal operation of the tax system, and is unrelated to non-compliance. For example, net GST/HST revenue is a function of both GST/HST revenues collected by businesses and input tax credits (ITCs) claimed in respect of GST/HST paid on business inputs. Businesses have up to four years to claim their ITCs and they are not required to allocate and report these amounts to preceding periods. Therefore, the net GST/HST revenue for a given period can be affected by the timing of businesses claiming ITCs, something that is completely unrelated to non-compliance.

As a result, tax gap estimates are best viewed over time, without overly examining year-to-year fluctuations, to provide an indication of the trend of non-compliance. This paper focuses on a 15-year period and finds that the estimated average GST/HST gap was about 5.6 per cent from 2000 to 2014, with a relatively stable trend.

## Concepts Underlying the Tax Gap

For this analysis, the tax gap is defined as the difference between the total theoretical tax liability (TTL) that would result from full compliance and actual assessed tax (AAT) by the tax administration (i.e., the Canada Revenue Agency (CRA) and the Canada Border Services Agency (CBSA)).

This analysis is intended to shed light on GST/HST non-compliance. In concept, the tax gap arises from economic activities occurring in the underground economy (i.e., under- or non-reported, informal, unlicensed and illegal economic activities). When taxable supplies are not declared or under-reported for tax purposes, tax is either not assessed or is under-assessed. While conceptually the tax gap is considered to be a compliance gap, the tax gap that is actually estimated can be influenced by factors unrelated to compliance such as the timing of claiming ITCs as noted above.

The estimates presented in this paper are not based on the amount of tax actually collected due to difficulties in obtaining accurate administrative data for GST/HST collections for a given tax year. As a result, the tax gap presented in this paper does not provide an indication of the payment gap (that is, the extent to which businesses do not pay their assessed tax liabilities, for example, due to bankruptcy).

This paper presents the tax gap as a percentage of the TTL. For further information on the definition, estimation and limitations of tax gaps, see the companion paper, *Tax Gap in Canada: A Conceptual Study*, being released concurrently with this paper.

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# GST/HST Gap Methodology

This analysis of the GST/HST gap is based on a "top-down" approach<sup>1</sup> using a number of economic and administrative data sources. The GST gap is not estimated separately from the HST because in provinces that joined the HST (Ontario, New Brunswick, Nova Scotia, Newfoundland and Labrador, and Prince Edward Island), the GST and the provincial portion of the HST are assessed as a single tax by the CRA and the CBSA. This analysis only covers the GST for Quebec.

## Total Theoretical Tax Liability (TTL)

The total theoretical GST/HST liability is the estimated amount of GST/HST that would result from all businesses accurately charging and reporting GST/HST. It is estimated as follows (terms not defined earlier are defined below):

$$TTL = (\text{Tax Base} \times UE) \times AETR$$

The estimated Tax Base is the combined GST/HST base comprised of household expenditures, residential construction, and the expenditures of entities that produce GST/HST exempt services<sup>2</sup>, including public sector bodies, listed financial institutions and certain other businesses. The data sources and related caveats are outlined below.

- Household expenditures are derived from personal expenditure data contained in Statistics Canada's Provincial Economic Accounts and Provincial Supply and Use Tables. The household expenditure base is estimated by applying an interpretation of the legal taxability to net expenditures by households on goods and services taking into consideration whether commodities are fully taxable, zero-rated or exempt.
- Investment in residential construction comprises new housing construction, alterations and improvements and transfer costs such as real estate commissions and legal fees. The tax base for residential construction is calculated from a reliable estimate of the GST on housing provided by Statistics Canada. This calculation is more robust than estimating this part of the tax base from Provincial Economic Account data which excludes the value of land (which is, however, subject to GST/HST) and records new construction at the time of construction rather than at the time of ownership or possession (which is when GST/HST is levied).
- The tax base related to public sector bodies captures taxable expenditures from municipalities, universities, schools, hospitals, colleges, charities and non-profit organizations. The estimation of this tax base is based on administrative GST/HST rebate data from the CRA and yields more robust results than estimating this base using statistical/survey data.

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1 A "top-down" approach uses external data such as Statistics Canada's National and Provincial Economic Accounts data to estimate the tax base, which is then used to estimate the TTL.

2 Businesses or other organizations that produce GST/HST exempt services are not eligible to claim ITCs on purchases made towards the provision of these services. Therefore, purchases of such inputs form part of the GST/HST tax base.

- The tax base of listed financial institutions stems from taxable expenditures by chartered banks, insurance corporations, credit unions and trust companies related to their provision of exempt services. This tax base is estimated using data from the CRA and Statistics Canada.
- The tax base of other businesses producing exempt services captures other exempt producers including physicians, dentists and private education. Due to the confidential nature of the data, this base is estimated by Statistics Canada based on the Supply and Use Tables.

Since economic activities taking place in the underground economy are only imperfectly captured in the National and Provincial Economic Accounts, the estimated tax base components are separately grossed up by factors that take into account the underground economy ("UE"). The UE gross-up factors are derived from Statistics Canada's estimates of the underground economy. For example, the consumer expenditure tax base is grossed up by a factor ranging from 2.8 per cent to 3.1 per cent depending on the year, which is derived by dividing the estimated gross domestic product (GDP) in the underground economy by reported GDP related to household final consumption expenditure. As the latest available estimates for the underground economy are for 2012, the 2013 and 2014 gross-up factors are assumed to be equal to those in 2012. Given that the tax gap estimates are intended to be an indication of non-compliance, they are highly dependent on the quality of the estimates of the underground economy. While Statistics Canada notes that the underground economy estimates are an upper bound for the activities that these estimates cover, they may be underestimates because activities that are forbidden by law (e.g., illegal drugs, prostitution) are not covered in the estimates due to the difficulty in obtaining reliable data.<sup>3</sup>

The adjusted tax base is then multiplied by the weighted average national effective tax rate of GST/HST ("AETR"). The AETR is estimated for each year based on the applicable GST rate and the provincial portion of the HST by participating province. For instance, the weighted AETR in 2012 was 8.6 per cent (see Annex).

## Actual Assessed Tax (AAT)

Actual assessed GST/HST is based on data for declared GST/HST revenue from the CRA and the CBSA. However, certain adjustments are made so that revenue forgone due to tax policy design is added back to AAT, and therefore, excluded from the GST/HST gap:

$$AAT = \text{GST/HST Revenue} + \text{POS} + \text{SmBus} + \text{S.87} + \text{PVATHousing} + \text{TBPVAT}$$

3 Charles Morissette (2014). *The underground economy in Canada, 1992 to 2011*. Statistics Canada Research Paper, Income and Expenditure Accounts Technical Series. Catalogue no. 13-604-M — No. 73.

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The following highlights the adjustments that are made to account for leakages due to legitimate reasons, including the data sources and caveats related to these estimates.

- **"POS"**: Provinces participating in the HST offer rebates of the provincial portion of the HST (PVAT) to consumers at the point of sale for certain items, such as books, children's clothing and footwear, diapers and heating oil. Since these items are part of the tax base, an adjustment based on Statistics Canada data and surveys is added to revenues to account for the forgone PVAT due to point-of-sale rebates.
- **"SmBus"**: The small supplier threshold rule allows businesses with annual gross taxable sales under \$30,000 to not register for GST/HST. A small supplier that chooses not to register for GST/HST does not collect GST/HST on goods and services sold and is ineligible for ITCs. Because the activities of small suppliers are included in the estimated tax base as if they were taxable, an adjustment to revenue is needed. The net GST/HST associated with the small supplier threshold is estimated based on T1 returns for unincorporated businesses and T2 returns for incorporated businesses, while accounting for those small suppliers that have voluntarily registered using GST data. This adjustment is rather notional for several reasons. First, a key assumption is that the net revenue of small suppliers is equal to the value-added on which GST/HST is levied. Second, this adjustment is based on aggregate data rather than taxpayer micro-data. Finally, there are challenges in respect of the quality of gross and net revenue information in T1 and T2 data.
- **"S.87"**: Purchases by status Indians on or delivered by the vendor onto a reserve are eligible for a GST/HST exemption under section 87 of the *Indian Act*, and are therefore not subject to GST/HST. The "S.87" adjustment is a notional estimate of the GST/HST that would be assessed on purchases by status Indians in the absence of the section 87 exemption. The estimate is based on several assumptions related to median income, the adult population of status Indians living on reserve and the share of income they spend on purchases on and delivered by the vendor onto a reserve. No data exists regarding the purchases by status Indians which are delivered by the vendor onto a reserve as the suppliers are not obligated to keep records in respect of purchases by status Indians. The "S.87" adjustment does not take into account that several Indian bands levy a GST-type of tax and section 87 of the *Indian Act* is not applicable within their respective reserves.
- **"PVATHousing"**: An adjustment is made for PVAT relieved on grandparented housing purchases that arise from provinces joining the HST or increasing their rates. This adjustment captures PVAT forgone due to sale agreements of new housing being signed before a tax change is announced for which the purchaser takes ownership or possession after the tax change is implemented. Information on these amounts is collected by the CRA.
- **"TBPVAT"**: Canada-U.S. transborder flights are subject to the GST but not to the provincial portion of the HST. An estimate of the associated forgone PVAT based on Statistics Canada data is added to revenues.

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## GST/HST Gap Estimation Formula

Table 1 in the Annex provides an overview of the estimates for the high-level components of the GST/HST gap for 2000 and 2014. To review, this paper estimates the GST/HST gap as follows:

$$\begin{aligned} \text{GST/HST Gap} &= 1 - \frac{\text{Actual Assessed GST/HST}}{\text{Total Theoretical GST/HST Liability}} \\ &= 1 - \frac{\text{GST/HST Revenue} + \text{Revenue Adjustments}}{(\text{Tax Base} \times \text{Base Adjustment}) \times \text{AETR}} \\ &= 1 - \frac{\text{GST/HST Revenue} + \text{POS} + \text{SmBus} + \text{S.87} + \text{PVATHousing} + \text{TBPVAT}}{(\text{Tax Base} \times \text{UE}) \times \text{AETR}} \end{aligned}$$

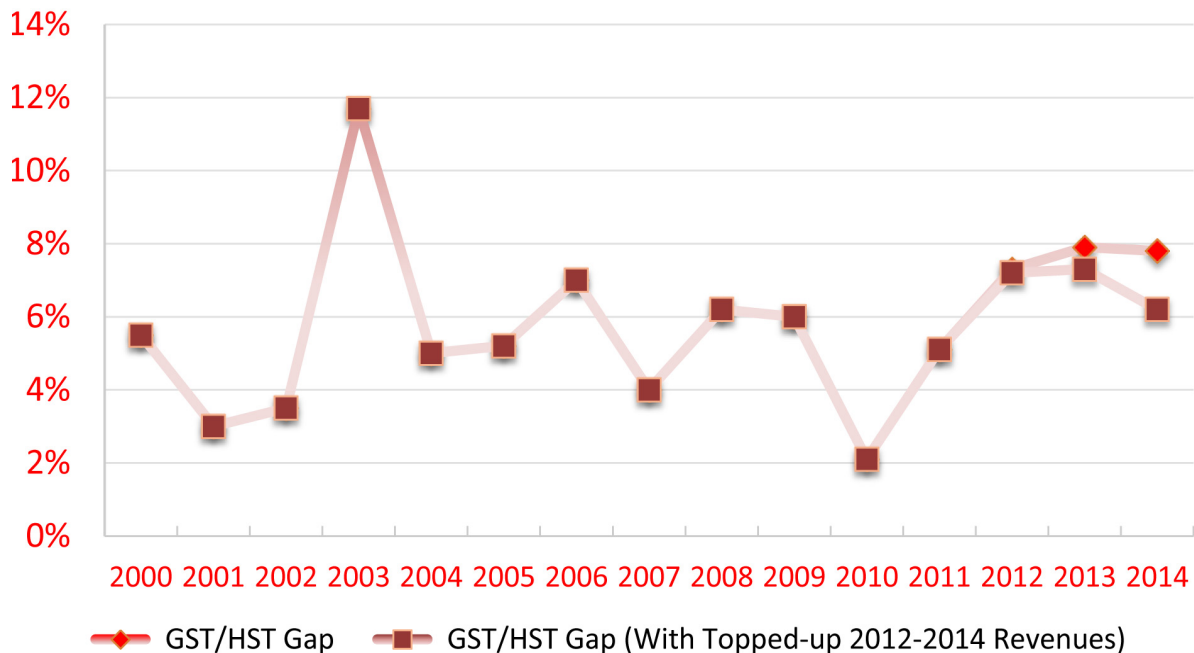
where:

- POS: Point-of-sale rebates adjustment
- SmBus: Small supplier threshold adjustment
- S.87: Section 87 of the Indian Act adjustment
- PVATHousing: Grandparented housing adjustment
- TBPVAT: Transborder flights adjustment
- UE: Underground economy gross up factor
- AETR: Average effective tax rate

# Findings

At first glance, the GST/HST gap appears to be fairly volatile since 2000 (Figure 1). The volatility in the GST/HST gap estimate indicator can be explained by reasons unrelated to tax compliance or the underground economy. Most of the volatility is caused by the timing of businesses claiming ITCs, which can have a significant effect on declared GST/HST revenues by the CRA and CBSA.

**Figure 1** GST/HST Gap Estimate (2000-2014)



**Note:** Figure 1 and Figure 2 below show two lines for the tax gap estimate which differ for 2012 to 2014. It takes time for the CRA and CBSA to assess GST/HST in full due to late filing and the results of audits. This effect is considered to be most significant for the most recent years and an estimated top-up is added to GST/HST revenues to make up for this shortfall (upper lines demarcated by diamonds). In contrast, the lower lines (demarcated by squares) show the estimated tax gap based on current data for GST/HST revenues.

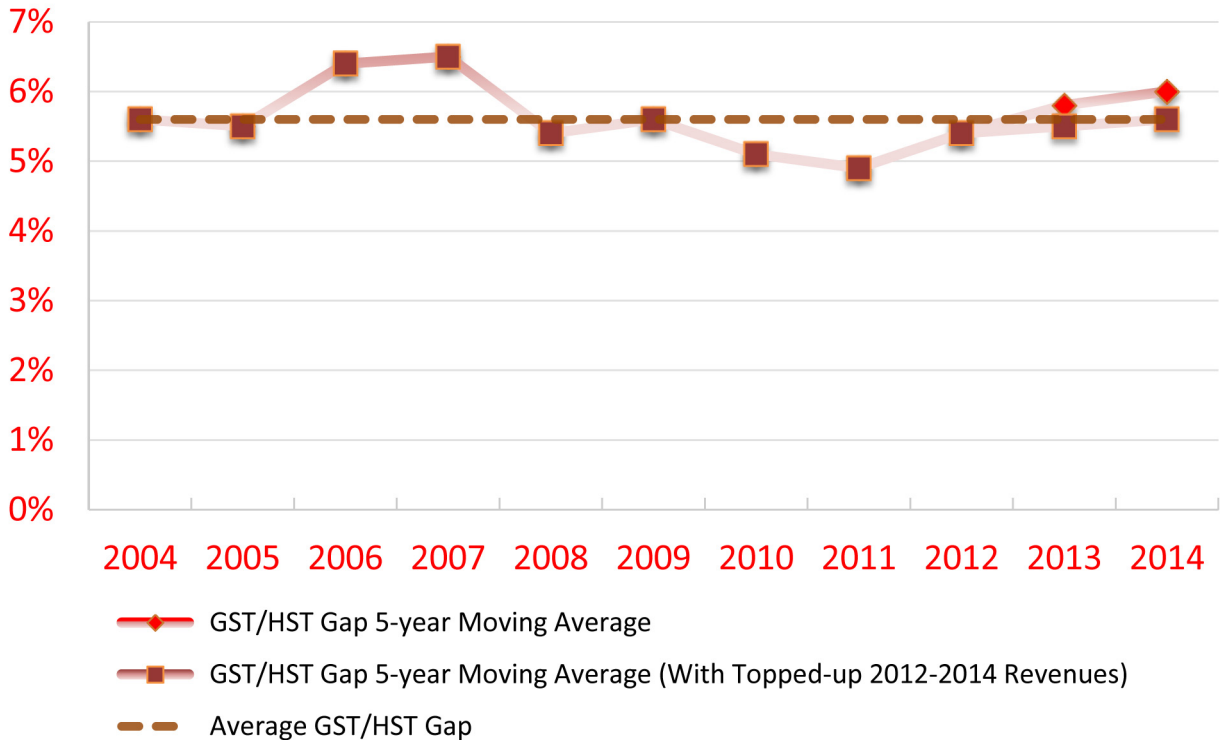
The following are explanations of the volatility in the GST/HST gap estimates:

- The estimated tax gap was well below average in 2001 and 2002 and well above in 2003. In response to pre-announced federal and provincial corporate income tax rate reductions, some businesses delayed claiming ITCs to increase their expenses in high tax years which deferred recognition of profits to lower tax years. This lag in ITCs caused GST/HST revenues to be higher than usual resulting in below-average GST/HST gap estimates in 2001 and 2002. Due to legislative changes, businesses had to claim all outstanding ITCs in 2003, causing the opposite effect on GST/HST revenues and estimated GST/HST gap.

- The estimated GST/HST gap for 2010 was well below average. Revenues were abnormally high because Ontario and British Columbia joined the HST on July 1, 2010, even after accounting for the higher overall average tax rate. This could be the result of several causes:
  - As mentioned, businesses can claim their ITCs up to four years after the period in which they were incurred. Some ITCs incurred in Ontario and British Columbia before July 1, 2010 at 5 per cent were claimed after that date. Because these ITCs were claimed at the 5 per cent rate while collections in the periods following July 1 were at the 13 per cent rate, total net revenues (collection less ITCs) in these periods would be inflated. In addition, the usual delays in claiming ITCs may have been exacerbated due to additional transitional difficulties for businesses due to the newly added provincial components. Note that revenues are not lost with this phenomenon, only shifted between reporting periods.
  - Some supplies made after July 1, 2010 may have contained embedded retail sales tax due to input purchases made before July 1 having the effect of inflating the pre-tax price, resulting in higher GST/HST collections.
- Similar but smaller and opposite impacts can be seen for 2006 and 2008, at the time of the GST rate reductions, as well as in 2013 with British Columbia's exit from the HST.

To smooth the effect of volatility, the GST/HST gap may be measured using a multi-year average. The estimated GST/HST gap during the 2000-2014 period is, on average, about 5.6 per cent (dashed line in Figure 2). Moreover, the 5-year moving average shows that the GST/HST gap estimates are relatively stable over time, which could be an indication that non-compliance with GST/HST has been fairly constant from 2000 to 2014.

**Figure 2 GST/HST Gap Estimate, Average and 5-Year Moving Average (2004-2014)**





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# International Comparison

It is difficult to make international comparisons of tax gaps because of different approaches used. Several countries, including Australia and the United Kingdom (U.K.), provide estimates for the tax gap related to their Value-Added Tax (VAT) that use a similar approach to the one used in this study. The GST/HST gap estimate of about 5.6 per cent presented in this paper is between estimates published by Australia and the U.K..

- The net GST gap in Australia is estimated at about 4.9 per cent in 2014.<sup>4</sup> This is defined as the difference between the theoretical GST liability (derived from the Australian System of National Accounts including a "non-observed economy"<sup>5</sup> uplift component" and adjusting for GST concessions) and accrual GST revenue (i.e., amounts remitted plus an estimate of amounts outstanding). The net GST gap estimate excludes debt, i.e., it does not account for any gaps in the payment of tax liability. For more information, see the companion paper being released concurrently with this paper.
- Estimates of the VAT gap in the U.K. have been fairly stable at approximately 10 per cent since 2009-10.<sup>6</sup> The VAT gap is the difference between VAT total theoretical liability (derived from expenditure data from the Office for National Statistics, net of input tax adjustments and after accounting for legitimate leakages) and actual VAT receipts. The 10 per cent figure is the VAT gap estimate related to non-compliance only, although the U.K. also publishes a gap estimate for non-compliance and non-payment combined.

A study with VAT gap estimates for most European Union (EU) countries estimates that the median VAT gap for the EU is about 13.9 per cent for 2013. Estimates range from 4 per cent in Finland, the Netherlands and Sweden, to 41 per cent in Romania for 2013. The VAT gap was estimated at 8.9 per cent for France, 11.2 per cent for Germany, and 16.5 per cent for Spain. The VAT gap is defined as the difference between the VAT total tax liability (derived from each country's National Accounts data which account for the non-observed economy<sup>7</sup>) and VAT collected. Due to the use of VAT collections rather than assessments, the EU approach is not directly comparable to this analysis. However, the EU estimates would likely be somewhat lower if assessed tax was used, which supports the indication that the GST/HST estimate presented in this paper is in the mid-range between other published VAT gap estimates.

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4 Australian Taxation Office (2015). *Measuring tax gaps in Australia, 2014-15*.

5 This differs somewhat from the Canadian estimate for the underground economy as the Australian estimate excludes informal economic activities but includes household production for own final use.

6 HM Revenue & Customs (2015). *Measuring tax gaps 2015 edition-Tax gap estimates for 2013-14*.

7 The EU study notes that each EU member state adjusts its National Accounts statistics to capture some elements of the informal economy but that the methodology may vary by country. It is also noted that estimates for illegal activities (i.e., prostitution, the production and trafficking of drugs, and alcohol and tobacco smuggling) will be included in future to comply with changes to the European System of Accounts. While this makes it difficult to pinpoint the differences from the approach used in this study, it suggests that the underground economy is accounted for differently.

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# Sensitivity Analysis

To determine the impact of a possible underestimation of the underground economy, the GST/HST gap analysis was subjected to sensitivity analysis.

- If the underground economy was 10 per cent larger, the 15-year average of the GST/HST gap from 2000 to 2014 would be about 6 per cent.
- If the underground economy was 50 per cent larger, the 15-year average of the GST/HST gap from 2000 to 2014 would be about 7.3 per cent.

The sensitivity analysis shows that the estimated average GST/HST gap would still be in the mid-range of comparable VAT gap estimates published by other countries.

## Conclusion

The analysis of GST/HST gap estimates for the period from 2000 to 2014 shows that, on average, about 5.6 per cent of potential tax revenues are forgone due to non-compliance. This paper does not attempt to estimate how much revenue is forgone due to non-payment. Many factors need to be considered when analyzing tax gaps including that the estimates are modeled and therefore impacted by the underlying assumptions and survey data.

While this estimate is useful in providing a rough benchmark of the extent of GST/HST non-compliance in Canada, it cannot be used to pinpoint which groups or sectors are the most likely to be non-compliant.

Tax gaps are best viewed as a trend over time. This is supported by the fact that fluctuations in the tax gap can be explained by the timing of when ITCs are claimed and changes to the GST/HST rates or provincial partners. This analysis suggests that non-compliance with the GST/HST has been fairly constant over time and is in the mid-range compared to international estimates.

# Annex

**Table 1** Estimates of the GST/HST Gap and Components, 2000 and 2014

	2000	2014*
GST/HST Revenue (Million \$)	31,600	68,700
Revenue Adjustments (Million \$)	300	1,300
<b>Actual Assessed GST/HST (Million \$)</b>	<b>31,900</b>	<b>70,000</b>
Tax Base (Million \$)	435,700	839,400
Overall Underground Economy Gross-up Factor	3.4%	3.5%
Average Effective Tax Rate	7.5%	8.6%
<b>Total Theoretical GST/HST Liability (Million \$)</b>	<b>33,700</b>	<b>74,900</b>
<b>GST/HST Gap Estimate</b>	<b>5.5%</b>	<b>6.5%</b>

**Notes:** \* GST/HST Revenue for 2014 has been adjusted to reflect the effect of late filers not captured in currently available data.

Dollar estimates are rounded to the nearest \$100 Million.

Totals may not add due to rounding.

The GST/HST gap figures have been estimated based on non-rounded numbers.