Canada Revenue Agency

Agence du revenu du Canada

Canada

Tax Gap in Canada:

A Conceptual Study

Minister's Message

I am pleased to present the Canada Revenue Agency's (CRA) study on tax gap estimation.

The study represents the first step toward understanding the concept of the tax gap and what it can – and cannot – tell Canadians and the CRA about compliance with Canada's tax system.

Canada enjoys a high level of compliance, with 93 percent of individuals filing their tax returns and paying their taxes on time. However, despite this commitment by the vast majority of Canadians to play by the rules and pay their fair share, we know that some attempt to avoid or evade the taxes they rightfully owe.

Budget 2016 made a historic investment to improve the CRA's ability to detect, audit, and prosecute tax evaders. This will build on the strong identification, audit and enforcement programs already in place and delivering results at the Agency.

It is important that the CRA use every tool at its disposal to ensure that Canadians and Parliamentarians have confidence in the fairness of the tax system. It is equally important that we continue to seek innovative ways to understand and combat non-compliance.

> That is why the Government of Canada is publishing an open and transparent discussion of the tax gap as a concept. We want to understand the benefits and drawbacks of tax gap estimation so we can maximize the value of this tool in the Canadian context.

In cooperation with the Department of Finance, we are also releasing a companion paper entitled *Estimating and Analyzing the Tax Gap Related to the Goods and Services Tax/Harmonized Sales Tax,* which contains an estimate of the tax gap related to the Goods and Services Tax/Harmonized Sales Tax (GST/HST). This estimate gives us an indication of the level of non-compliance with GST/HST rules and also demonstrates some of the insight that can be gained through tax gap estimation.

Together, these reports lay the foundation for the Government's future work on the tax gap and complement the work underway to deliver on our commitment to transparency and to a tax system that functions fairly.

Looking ahead, we will continue our work toward developing the tools necessary to estimate the tax gap and we will keep the lines of communication open with stakeholders and all Canadians as we progress in this important work.

The Honourable Diane Lebouthillier, P.C., M.P.
Minister of National Revenue

Executive Summary

On April 11, 2016, the Government of Canada announced a historic investment of over **$444 million** to enhance the CRA's ability to detect, audit, and prosecute tax evasion, both at home and abroad. At that time, the Minister of National Revenue also announced that the CRA would begin work to estimate the tax gap.

Broadly defined, the tax gap is the difference between the tax that would be paid if all obligations were fully met in all instances, and the tax actually paid and collected.

The tax gap is a complex concept that can be considered from a number of perspectives – domestic or international, by type of tax or taxfiler, or by form of non-compliance. A country's aggregate tax gap – that is all tax dollars lost through all forms of non-compliance – is, in reality, the sum of a number of smaller tax gaps, representing revenue lost to non-compliance with distinct types of taxes such as income taxes or value added taxes (VAT), or areas of non-compliance, for example unreported or under-reported income or non-payment of taxes owing.

> Tax gap estimation is a challenging. Estimates should be (a) useful to taxpayers in better understanding what the tax administrator is doing and its effectiveness in undertaking those activities, and (b) relevant for a tax administration in improving compliance.

While there is generally no direct method for calculating the tax gap, it can be estimated, albeit with varying levels of precision. There are two main approaches used to develop tax gap estimates: top-down and bottom-up. Top-down methodology relies mainly on independent external data (usually national accounts data) to estimate the tax base, a figure that is then used to calculate a theoretical value of tax that should be paid and collected. Bottom-up methodology, on the other hand, uses a tax administrator's internal administrative data to estimate the amount of taxes theoretically owing.

> Countries around the world have started publishing tax gap estimates including the United Kingdom, United States, Sweden, and Australia. Each of these countries takes a different approach and estimates different components of their respective tax gaps. Their experience can provide valuable insight into the benefits and challenges of tax gap estimation.

There are a number of challenges facing tax administrations undertaking tax gap estimation. The key challenge is access to the comprehensive and good-quality data necessary to produce estimates. A significant proportion of the tax gap involves unreported or under-reported income and assets and economic activity that are deliberately hidden from the government. As a result, many countries that publish tax gap estimates highlight their uncertainty.

Nevertheless, tax gap estimates, considered along with other information and intelligence on non-compliance, can provide insight into the overall health of the tax system and approximate the level of non-compliance with tax laws. They can also act as a guide for tax administrators and enhance the value of the intelligence held by a tax administration on the sources of non-compliance within the tax system.

Chapter 1 Introduction

The fairness and integrity of the self-assessment tax system is rooted in compliance with the tax rules – that is, the right people paying the right amount of tax at the right time.

The fundamental importance of a fair and efficient tax system and, consequently, of ensuring compliance has led to an increased focus on accountability of tax administrations by taxpayers and stakeholders alike, as well as on performance measurement by governments. However, assessing compliance and the overall health of the tax system is a complex task. The domestic underground economy and international tax evasion, for example, are difficult to quantify because, by definition, they involve undeclared or under-declared income and assets or transactions that are deliberately hidden from the government.

Tax administrators use a variety of techniques to understand and combat non-compliance and their approaches are constantly evolving. In recent years, some tax administrations have started to use the tax gap as an additional tool to help evaluate the extent of lost tax revenue and the effectiveness of their compliance activities, and to communicate to the government and the public the results of their efforts.

This paper represents the first step in the Canada Revenue Agency's (CRA) work on the concept of the tax gap. As we begin this work, it is important that Canadians and stakeholders alike have a clear understanding of what a tax gap estimate is and what it can – and cannot – tell the CRA and Canadians.

To achieve this understanding, this paper:

- Examines some of the key considerations related to tax gap estimation;
- Outlines the approaches to tax gap estimation taken by key countries that publish such estimates;
- Reviews the advantages and limitations of tax gap estimation and discusses the potential utility and relevance of the concept for the CRA; and
- Identifies the next steps that the CRA will take on this issue.

In cooperation with the Department of Finance, the CRA is also releasing today a companion paper entitled *Estimating and Analyzing the Tax Gap Related to the Goods and Services Tax/Harmonized Sales Tax,* which contains an estimate of the tax gap related to Canada's Goods and Services Tax/Harmonized Sales Tax (GST/HST). The results indicate that the average estimated GST/HST gap over the 2000 to 2014 period was 5.6 percent of the total theoretical revenues with a relatively stable trend. The GST/HST estimate also demonstrates some of the insight that can be gained through tax gap estimation.

Ensuring Compliance with the Federal Tax System

The CRA's compliance activities protect the integrity of Canada's self-assessment system by identifying and addressing those who do not accurately report income. Our compliance interventions follow an escalating approach, from influencing voluntary compliance to enforcing it.

- We seek to influence compliance attitudes by increasing taxpayers' understanding of their tax obligations through targeted outreach activities, client service, and education.

- We also conduct examinations, audits, investigations, and collection activities at the domestic and international levels to ensure compliance with Canada's tax laws, including payment of amounts owed.

In recent years, the CRA has taken significant action to detect, correct and deter non-compliance. This has included increasing the focus on high-risk segments of the population and reducing the burden on compliant and low-risk taxpayers, as well as reinforcing strategic partnerships with key countries and organizations, developing business intelligence tools to maximize the use of all available tax data, and enhancing risk assessment capacity.

Further investments to crack down on tax evasion and combat tax avoidance will increase the CRA's ability to find those who aggressively evade or avoid taxes, making the tax system fairer for everyone. To that end, Budget 2016 proposed to invest $444.4 million over five years for the CRA to enhance its efforts to crack down on tax evasion and combat tax avoidance by:

- hiring additional auditors and specialists;

- developing robust business intelligence infrastructure;

- increasing verification activities; and

- improving the quality of investigative work that targets criminal tax evaders.

These measures are expected to result in a revenue impact of **$2.6 billion** over five years.

The CRA will also continue ramping up its outreach efforts to ensure that taxpayers understand and meet their tax obligations. These efforts improve tax compliance through a "get it right from the start" approach to educate, inform and support taxpayers by improving service and encouraging voluntary compliance.

Chapter 2 The Tax Gap – Definition and Conceptual Issues

2.1 What is the Tax Gap?

a. Definition

Broadly defined, the tax gap is the difference between the taxes that would be paid if all obligations were fully met in all instances, and the tax actually paid and collected.

The tax gap is sometimes seen as a measure of tax fraud or similar conduct. However, the tax gap encompasses revenues lost due to both intentional and unintentional behaviour, including tax evasion, taxpayer error, and in some cases unpaid and uncollectible tax liabilities (such as when a taxpayer is bankrupt).

While it may appear to be a relatively simple concept, tax gap estimation is complex and is grounded in the unique circumstances of each tax administration. The legislative and administrative framework of each particular country will influence whether and how tax gap estimates are undertaken.

Estimating the tax gap will only be useful if the information gained through the process is (a) useful to taxpayers in better understanding both what the tax administrator is doing and its effectiveness in undertaking those activities, and (b) relevant for a tax administration in improving compliance.

On a conceptual level, the tax gap is multi-faceted.

- The tax gap can be evaluated from a number of perspectives: domestic or international, by type of tax (such as income taxes, VAT, excise taxes etc.), by form of non-compliance (such as non-payment, taxfiler error, deliberate under-reporting, etc.), or by type of taxpayer (such as individuals, corporations, trusts, non-residents, etc.).

- The tax gap can also be presented in a variety of ways: as a dollar amount or range, a percentage of some other amount (e.g. percentage of tax liability or percentage of revenue), a trend over time, or a combination of all these.

- The aggregate tax gap – that is, all tax dollars lost though all forms of non-compliance – is, in reality, the sum of a number of smaller tax gaps, representing revenues lost to distinct types or areas of non-compliance, for example the VAT gap (e.g. GST/HST), or the non-payment tax gap.

- For a number of reasons that will be discussed later in this paper, tax gap estimates are all subject to varying degrees of uncertainty based on a variety of factors including the type of tax gap being estimated and the availability of and quality of supporting data.

In summary, the tax gap is a complex concept and its estimation is both nuanced and contentious. The following three sections examine additional challenges faced by tax administrators when estimating the tax gap.

The Underground Economy

On June 20, 2016, Statistics Canada released a study, commissioned by the CRA as part of our ongoing efforts to understand the underground economy, containing new estimates of the underground economy for Canada from 1992 to 2013. The study indicated that in 2013, total underground activity in Canada was estimated at $45.6 billion or 2.4 percent of Gross Domestic Product (GDP). These estimates represent an upper bound (or the maximum potential underground activity beyond what is already included in GDP).

> The Statistics Canada underground economy estimate is not a tax gap estimate. The Statistics Canada study provides information on the growth or decline of the underground economy in relation to the GDP for Canada and the provinces and territories. It does not estimate the total amount of taxes that are not reported or paid as a result of these activities.

That said, the results of the study are being used by the CRA, in conjunction with other information, to develop targeted strategies to combat non-compliance and to direct resources to the sectors of the economy at highest risk for underground economy activity.

b. Tax Avoidance

The appropriate treatment of tax avoidance for the purposes of tax gap estimation is a matter of debate internationally. While it is clear that tax evasion, or deliberate contravention or ignoring of a specific part of the law, should be considered to contribute to the tax gap, the appropriate treatment of tax avoidance is less clear.

Tax Avoidance vs. Tax Evasion

Tax avoidance results when actions are taken to minimize tax, and when – while within the letter of the law – those actions contravene the intent and spirit of the law, for example, where a person undertakes a series of transactions that have as a primary purpose to reduce or eliminate tax in a manner not intended by the law.

Tax evasion typically involves deliberately ignoring a specific part of the law. For example, those participating in tax evasion may under-report taxable receipts or claim expenses that are non-deductible or overstated. They might also attempt to evade taxes by willfully refusing to comply with legislated reporting requirements.

Tax evasion, unlike tax avoidance, has criminal consequences. Tax evaders face prosecution in criminal court.

The challenge with tax avoidance in particular is that, due to the highly complex nature of certain transactions, it is often difficult to distinguish between legitimate and abusive activities based on the information available to tax administrations. Some methodologies used to estimate the tax gap, by their very nature, may capture tax avoidance. For example, an estimate developed using high-level economic indicators such as national accounts data (otherwise known as the top-down approach, which will be discussed later in this paper) may capture tax avoidance since it is based on data external to the tax administrator that captures activities which may not be reported for tax purposes. However, this method may not necessarily be able to distinguish between tax evasion, acceptable tax planning, and tax avoidance.

The United Kingdom explicitly includes tax avoidance in its tax gap estimates. Her Majesty's Revenue and Customs (HMRC), the United Kingdom's tax administration, views tax avoidance as "exploiting the tax rules to gain a tax advantage that Parliament never intended." In HMRC's view, this activity is different than tax planning, which involves using the various tax "reliefs" (that is, tax credits and deductions) for the intended purpose of reducing tax. Other countries examined in the course of this study do not specifically address tax avoidance in their estimates.

The inclusion or exclusion of tax avoidance is one of the many decisions that must be considered by tax administrations when determining the parameters that apply to their tax gap estimates.

c. Gross vs. Net Tax Gap

Generally speaking, the gross tax gap is the total estimated tax gap, while the net tax gap takes into account the impact of a tax administration's enforcement activities.[1] The Internal Revenue Service (IRS) in the United States refers to the net tax gap as "the portion of the gross tax gap that will not be paid."

The factors used to determine the net tax gap vary across countries – some (like Sweden) consider only the results of audits, while others (such as the United States) also include late payment and the impact of collections activities.

Presentation of both a gross and net tax gap estimate may be the most complete for taxpayers and stakeholders, as it provides an estimate of the overall level of non-compliance, insight into the tax administration's effectiveness in promoting compliance, and an estimate of the amounts that are likely to remain uncollected. However, the ability to do so would depend on the information and resources available to undertake such analysis.

d. The International Component

The portion of the tax gap that could be attributed to overseas tax evasion and other cross-border transactions, or the international component of the tax gap, is of significant interest to the public and stakeholders, as uncollected taxes resulting from these types of activities are often thought to be substantial. Unfortunately, the international component is also the most complex aspect of the tax gap to estimate. This is not to say that tax administrators do not have an in-depth understanding of overseas evasion, but rather that it is exceedingly difficult to quantify.

Defining the international component of the tax gap is a complex matter; as a concept, the international tax gap could be understood in a number of ways. For example, the international component could be defined broadly as all aspects of the tax gap that have any international connection whatsoever. Alternatively, a narrower view could be taken that would define the international tax gap as including only those international transactions undertaken by taxpayers explicitly designed to evade taxes.

Further, as will be discussed in greater detail later, specific data challenges exist related to estimating the international component of the tax gap, which lead to a high degree of uncertainty when developing international tax gap estimates.

2.2 How Are Tax Gaps Estimated?

To arrive at tax gap estimates, tax administrations rely on data from within and outside their organizations. The data are collected and analyzed through the lens of the definition of the tax gap adopted by the particular country, based on a variety of decisions about what should and should not be included in a tax gap estimate and the context of the existing tax framework.

The approaches used by tax administrators to undertake these estimates are constantly evolving but are mainly categorized as top-down or bottom-up methods.

1 The range of activities undertaken to improve compliance is very broad and interventions can occur at any point in a taxpayer's compliance journey: compliance measures are not restricted to auditing, but are increasingly taking the form of preventative measures and other interventions designed to help taxpayers get it right from the start. Accordingly, even estimates of the gross tax gap are influenced to a certain extent by broad awareness of the tax administration's compliance actions and activities through the deterrence effect they have.

a. Top-down Methodology

Broadly speaking, top-down methodology uses independent external data (usually national accounts data) to estimate the tax base, a figure that is then used to calculate a theoretical value of tax that should be paid and collected, by applying the appropriate tax rate to that high level figure. The actual amount of tax paid and collected is then subtracted from the theoretical value to estimate the tax gap. This approach is most commonly used to estimate tax gaps for indirect taxes (including VATs such as the GST/HST, as well as excise duties and taxes) and indeed is the method used to estimate the GST/HST gap in the study released concurrently with this paper.

THEORETICAL VALUE OF TAX
− ACTUAL AMOUNT OF TAX

TAX GAP ESTIMATE

The top-down approach is ill-suited to estimating tax gaps related to direct taxes, such as income taxes, because, although it can estimate a broad measure of income, it does not take into account the particular circumstances of taxpayers reflected in the various credits and deductions claimed.

Key to top-down methodology is the extent to which economic activity is captured in the national accounts data and the level of detail they provide. In addition, national accounts data should be independent and not linked in whole or in part to tax data.

Top-down estimates are limited in their usefulness from a tax administration perspective because the estimates are aggregate and can only indicate whether the tax administration collects a significant portion of the taxes that should be paid. In other words, it is difficult to determine from a top-down estimate which groups or sectors of taxpayers may be at risk of non-compliance, which in turn makes it difficult for the estimate to help target compliance activities to particular groups or sectors. This is reflected in the GST/HST study, which provides an overall estimate of the GST/HST gap but indicates that the study cannot pinpoint which "groups or sectors are the most likely to be non-compliant." Nevertheless, top-down estimates can identify relatively broad areas for further investigation using other data sources.

b. Bottom-up Methodology

Bottom-up methodology uses a tax administrator's internal administrative data to estimate the amount of taxes theoretically owing. In general, a statistically representative sub-set of taxpayers is used to estimate non-compliance, which is then extrapolated to the full taxpayer population to produce a tax gap estimate. This approach is used for estimating tax gaps related to direct taxes.

Unlike the top-down approach, bottom-up estimation of the tax gap requires extensive individual taxpayer-level data on non-compliance. To gather that data, the bottom-up approach relies on methods such as random audit programs and data-matching[2], resulting in the identification of specific tax segments of non-compliance, something that the top-down approach cannot do directly.

For a variety of reasons, auditors do not always identify all sources of non-compliance in the course of conducting audits. As a result, bottom-up estimates are often subject to a significant adjustment factor to account for undetected non-compliance.

Given the type and extent of data requirements, bottom-up methodologies are significantly more expensive and burdensome for taxpayers, especially those based on random audits.

c. Data Considerations More Generally

One of the key challenges tax administrators face in estimating the tax gap is access to the comprehensive and good-quality data necessary to produce an estimate. Significant aspects of the tax gap, such as the domestic underground economy and international tax evasion, by definition involve unreported or under-reported income and assets and transactions that are deliberately hidden from the government. This makes it difficult to quantify the amount of tax revenue lost due to these activities.

Tax gap estimates must be interpreted with the understanding that they are based on the tax administrator's knowledge at the time.

The quality and quantity of data available is fundamental to every aspect of tax gap estimation.

Other countries' experiences demonstrate that a lack of available data may lead a tax administrator to determine that estimation of a particular aspect of the tax gap is not feasible. Available, but poor-quality, data may allow an estimate to be calculated, but with a lower level of reliability or confidence and usefulness.

Finally, the process of undertaking a tax gap estimate may in fact identify areas where information and data are lacking and so may be helpful in highlighting areas for future development or investment.

2 Data matching: the comparison of two sets of data, matching one set against another set or comparing complex variables for similarities.

d. International Component – A Special Case

Estimating the international component of the tax gap, or tax revenues lost to overseas tax evasion and other cross-border transactions, with a sufficient degree of accuracy presents a distinct set of challenges. In addition to requiring the estimation of income and assets that are deliberately hidden from the government, estimating the international tax gap requires reliable and consistent data from other jurisdictions – this is a difficult task, given the large number of countries and institutions/intermediaries involved (e.g. foreign governments and tax administrators, financial institutions etc.). Other countries also face this challenge; the CRA is not aware of any countries that currently estimate the international component of the tax gap.

That said, in 2008, Sweden estimated the international component of its tax gap – which appears to be the only estimate of its kind published to date by any country. The international estimate prepared by Sweden in 2008 was based on the experience of the tax authority's foreign sections and some top-down estimation using national accounts and financial account data. Sweden described the estimate as highly uncertain due to a lack of data to quantify the gap.

In 2014, when the Swedish Tax Authority (STA) published a new tax gap report, it was not able to estimate the overall tax gap or the international component due to data limitations. In fact, the tax authority indicated that:

> "Tax gaps due to international evasion have not been studied explicitly, even though it has previously been acknowledged that gaps within this area are likely to be substantial. The STA has a relatively high level of knowledge regarding the nature of gaps in the international field, but finding data that would make it possible to quantify the gap is particularly difficult since it generally concerns activities and/or persons located overseas."
>
> — *Tax Gap Map for Sweden, How it was created and how can it be used? Report 2008:1B*, Swedish Tax Agency

There are a number of significant data issues that make estimating the international component of the tax gap especially challenging for tax administrations, including the availability of third-party data (e.g. from financial institutions). There are generally no prohibitions to overseas investment, provided that the investor follows tax rules that apply in his or her particular circumstances. As noted earlier in this paper, it is often difficult to distinguish between legitimate and abusive activities based on the information available to tax administrations due to the highly complex nature of certain transactions.

Developing a bottom-up estimate of the international component of the tax gap would likely require expanded collaboration with international partners, not only on data sharing issues, but also on the larger question of the overall feasibility of undertaking this type of estimate. Further, the generality of top-down estimation would likely not be able to capture the complexities, such as varying tax rates and return on investment, that would be required to achieve a reliable estimate.

Taxes lost to offshore evasion or avoidance are of great interest both to tax administrations and to the public. In recent years, there has been increasing international pressure to improve transparency and the exchange of information internationally to enable tax administrations to address tax avoidance and evasion. Ongoing work with the Organisation for Economic Cooperation and Development (OECD) and a significant increase in international cooperation is expected to provide more information and lead to better and more consistent methodologies to produce more reliable estimates.

International Cooperation

The Government of Canada continues to play a leadership role in the growing global network of tax administrations that work together to fight offshore tax evasion and tax avoidance. Information sharing and international cooperation are paramount to fighting international tax evasion and aggressive tax avoidance, serving as a deterrent and a means to identify non-compliance.

Canada is working in conjunction with the OECD to combat the adverse fiscal and economic impacts of base erosion and profit shifting (i.e. tax avoidance or aggressive international tax planning). Canada, together with its OECD counterparts, is participating in a Base Erosion and Profit Shifting (BEPS) project. As part of the its work to tackle BEPS, the project seeks to improve access to and analysis of available data across jurisdictions and to collect new data to measure, monitor and take action to address base erosion and profit shifting.

Work by the OECD on data sharing issues, both within and outside of BEPS, has led to the adoption of new initiatives related to data sharing.

- **Country-by-Country Reporting:** almost 40 jurisdictions now require large multinational enterprises (MNE) to report, for each tax jurisdiction in which they do business, on key aspects of their operations, including the MNE's revenue, profit before income tax, number of employees, income tax paid and accrued, retained earnings, and tangible assets. This applies to fiscal years beginning on or after January 1, 2016.

- **Common Reporting Standard:** beginning in 2018, 101 participating jurisdictions will automatically exchange the financial account information of resident individuals and entities (e.g. trusts and foundations) reported to them by financial institutions. Information will include balances, interest, dividends and sales proceeds.

Canada has one of the most extensive tax treaty networks in the world, with 92 tax treaties and 22 Tax Information Exchange Agreements in force at this time. Canada has also recently ratified the multilateral Convention on Mutual Administrative Assistance in Tax Matters, which further expands our international information sharing network.

Chapter 3 What Do Other Countries Do?

3.1 Overview

In 2015, the OECD published its most recent report on tax administration,[3] which included a survey conducted in 2013 of a number of countries on different aspects of the administration of their respective tax systems. Of the 56 countries surveyed, 24 produced estimates of the tax gap for at least some of their domestic taxes.

The most common estimates related to VATs, with income tax and excise tax gaps also frequently estimated. Of the countries that estimate some component of the tax gap, a total of 13, including the United States, the United Kingdom, Sweden, and Australia, reported the results publicly. However, the frequency of these estimates varies greatly, from a one-time estimate to an annual estimate.

A number of countries surveyed by the OECD also indicated that they use or intend to use random audit programs for some taxes administered. These programs serve a variety of purposes in addition to tax gap estimation, including helping to develop and/or refine risk profiling systems, monitoring compliance in specific areas of the tax system and helping identify areas for potential legislative change. Random audit programs can also act as a general deterrent to non-compliance.

A comparative table of the strategic approach for managing tax compliance of OECD countries, and in particular their use of tax gap estimation, can be found in the table on the next page.

3.2 Tax Gap Estimation Programs in Other Countries

Of those countries that do publish tax gap estimates, varying degrees of detail and experience are provided. The approaches of a number of key countries are highlighted below.

It is important to note that tax gap estimates developed by different countries are not directly comparable due to differing economies, varied tax policy and administrative contexts, as well as a range of approaches to estimating the tax gap.

3 OECD (2015), *Tax Administration 2015: Comparative Information on OECD and Other Advanced and Emerging Economies*, OECD Publishing, Paris. http://dx.doi.org/10.1787/tax_admin-2015-en

Table 1		Tax gap estimates for some/all taxes			
Country	Formal risk management process used	Required by MOF*	Research carried out	Results made public	Random audits for some/all taxes
Australia	✓	✗	✓	✓	✗
Austria	✓	✗	✗	N/A	✓
Belgium	✓	✓	✓	✗	?
Canada	✓	✗	✗	N/A	✓
Chile	✓	✗	✓	✓	✗
Czech Republic	✓	✓	✗	✗	✗
Denmark	✓	✓	✓	✓	✓
Estonia	✓	✓	✓	✓	✓
Finland	✓	✓	✓	✓	✓
France	✓	✓	✗	N/A	✓
Germany	✓	✗	✗	N/A	✓
Greece	✓	—	—	—	—
Hungary	✓	✗	✗	✗	✓
Iceland	✓	✗	✗	N/A	✓
Ireland	✓	✗	✗	N/A	✓
Israel	✓	✗	✗	N/A	✓
Italy	✓	✗	✗	N/A	✗
Japan	✓	✗	✗	N/A	✓
Korea	✓	✗	✗	✗	✗
Luxembourg	✓	✗	✓	✓	✓
Mexico	✓	✓	✓	✓	✗
Netherlands	✓	✗	✗	N/A	✓
New Zealand	✓	✗	✗	N/A	✗
Norway	✓	✗	✓	✗	✓
Poland	✓	✓	✓	✗	✗
Portugal	✓	✗	✓	✗	✗
Slovak Republic	✓	✗	✓	✓	✗
Slovenia	✓	✗	✓	✓	✗
Spain	✓	✗	✗	N/A	✗
Sweden	✓	✗	✓	✓	✗
Switzerland	✓	✗	✓	✗	✓
Turkey	✓	✓	✓	✗	✓
United Kingdom	✓	✓	✓	✓	✓
United States	✓	✗	✓	✓	✓

*Ministry of Finance
Source: *FTA Tax Administration 2015: Comparative Information on OECD and Other Advanced and Emerging Economies Series*

a. United Kingdom

Of the countries discussed in this paper, the U.K. estimates the largest number of components of its domestic tax gap, including VAT, corporate income tax, personal income tax, excise tax, national insurance contributions, and capital gains tax. As noted above, the HMRC includes a separate estimate of its tax gap attributed to tax avoidance.[4] HMRC does not publish a separate estimate of the international component.

> HMRC defines the tax gap as "the difference between the amount of tax that should, in theory, be collected by HMRC, against what is actually collected."

The estimates are expressed both as an absolute figure (that is, in British pounds) and as a percentage of tax liability so to better measure compliance over time.

- For 2013-14, the total tax gap is estimated to be GBP34 billion, which is 6.4 percent of total theoretical tax liabilities, indicating that over 93 percent of tax due that year was collected.
    - Income tax, National Insurance Contributions and Capital Gains Tax accounted for 41 percent of the overall tax gap or GBP 14 billion.
- The 2013-14 estimate shows that the United Kingdom tax gap estimate has slowly declined since 2005-06, both in terms of absolute value, from GBP 37 billion to GBP 34 billion, and as a percentage of liabilities, from 8.4 percent to 6.4 percent.

HMRC has indicated that "although the tax gap isn't sufficiently timely or precise enough to set performance targets, it provides important information which helps us understand our long-term performance."

The methodology used by HMRC to estimate the tax gap depends on which aspect of the domestic tax gap is being estimated (e.g. VAT, excise tax). Both top-down and bottom-up methodologies are used, with methods and data sources like: data matching, management information, random enquiries (that is, random audits), and illustrative measures.[5]

The top-down approach is used to estimate VAT and excise tax gaps by comparing consumption data to tax receipts. Bottom-up estimates are used for direct taxes, with components of the direct tax gaps estimated separately for each different group of taxpayers and type of non-compliance.

The United Kingdom is one of the only countries that provides information regarding the cost of its tax gap estimation program. In 2015, the United Kingdom reported that 14 full-time equivalent employees work on improving, producing assuring and explaining the domestic tax gap (not including its random audit program), along with a random audit program that has a staff cost of about GBP 2 to 4 million.

4 The tax avoidance gap estimated by HMRC reflects cross-border tax avoidance which can be challenged under U.K. law.

5 Illustrative measures: assumptions made on existing data to develop a possible scenario of reality.

b. United States

The United States estimates all three aspects of its tax gap: the non-filing gap, the underreporting gap, and the underpayment gap. It estimates most of these components for each type of tax separately: corporation income tax, individual income tax, estate and excise tax, and employment tax. It does not explicitly identify the international component of its tax gaps.

> The IRS defines the tax gap as "the amount of tax liability faced by taxpayers that is not paid on time".

In late April 2016, the IRS released new tax gap estimates for tax years 2008 to 2010.

- For this period the IRS estimated that the gross tax gap averaged USD458 billion per year, with an average yearly net tax gap of USD406 billion. This represents a voluntary compliance rate of 81.7 percent (or 83.7 percent net voluntary compliance rate).
    - Underreporting of individual income tax accounted for the largest portion of the gross tax gap – an annual average of USD264 billion for the 2008 to 2010 tax years.
- While the dollar values estimated are higher than the previous report issued for the 2006 tax year (USD450 billion gross and USD385 billion net), the new report indicates that the increase reflects improvements to the IRS' methodology which lead to a more accurate and comprehensive estimate.

The report also indicates that compliance rates are significantly higher when third-party reporting is required and even higher when amounts are subject to third-party withholding (that is where a payer of an amount of income is required to deduct an amount of tax from the payment and remit it directly to the government).

Several methods are used to estimate the tax gap, including the use of administrative and third-party data, along with a substantial random audit program (about 14,000 random audits of individual income tax returns annually).

The IRS first issued tax gap estimates in July 1983 that covered tax years 1973, 1976, 1979, and 1981. Those estimates relied heavily on information gathered from an extensive random audit program, the Taxpayer Compliance Measurement Program (TCMP). The TCMP covered a nearly 25-year period including selected tax years from 1963 through 1988. After the 1988 tax year, the TCMP was discontinued. In 1988 the IRS issued estimates of the individual and corporation income gross tax gaps that focused on tax years 1973-1992. Subsequent reports included a net income tax gap report issued in 1990, an employment tax gap report issued in 1993, and an individual income tax gap report issued in 1996 (that was based on the final TCMP studies for tax year 1988). Formal tax gap estimation recommenced in 2005 for tax year 2001 using data collected by the newly formed National Research Program. The results of these analyses were released in March of 2005 and April 2006.

Tax gap estimates published by the IRS in 2006 and 2012 related to a single tax year whereas the results released in 2016 present an average compliance rate and associated average annual tax gap for the tax years 2008 to 2010. The IRS has indicated that this shift reflects a change in methodology aimed at improving the reliability of the individual income tax underreporting gap estimates by sources of non-compliance stemming from the redesign of the NRP from larger periodic samples to smaller ones.

c. Sweden

Sweden has estimated various components of its tax gap in the past including: VAT, corporate income tax, and personal income tax.

> The Swedish Tax Authority (STA) defines the tax gap as "the difference between the tax that would have been determined if all taxpayers had reported all their activities and transactions correctly and the tax that was determined in practice following the STA's compliance procedures."

In 1998, at the request of the Swedish Government, the STA made its first attempt to estimate the tax gap. Since then, tax gap estimates have been published periodically by the STA.

- In 2008, the STA produced comprehensive tax gap estimates of a number of components of its tax gap, including, as noted above, the international component. Overall, its estimates suggested a total tax gap of SEK133 billion or 10 percent of tax determined.
- However, in its most recent tax gap report, published in 2014, the STA stated that data limitations prevented estimation of the tax gap, but suggested that the tax gap had probably decreased between 2007 and 2012.

The STA has used both top-down and bottom-up methodologies, with methods and data sources including: third-party data, surveys and random checks (that is, random audits). The STA suggests that the more information the STA has on the tax base from sources other than taxpayers themselves, the smaller the scope for errors, and that an estimation of the auditable tax gap would require an increase in random audits.

The STA has not indicated publicly whether or how it intends to undertake tax gap estimation in the future. The STA indicated in its 2014 report that estimating the tax gap is a difficult task, particularly given that major parts of the tax gap are deliberately hidden. Further, the type of data that was used to develop the 2008 estimate is no longer available due to a shift in the STA's approach to auditing. More specifically, the STA now conducts fewer and more detailed audits of high-risk taxpayers rather than random files, which does not provide the type of information required to develop a reliable tax gap estimate.

d. Australia

Australia has estimated and published the tax gap since 2012 and currently estimates tax gaps related to the goods and services tax (GST) and luxury car tax and some excise taxes.[6]

> The Australian Tax Office (ATO) defines the tax gap as "the difference between the estimated amount of tax theoretically payable assuming full compliance by all taxpayers, and the amount actually reported to the ATO, or collected by the ATO for a defined period."

- Australia's net GST gap in 2013-14 was estimated at AUD2.7 billion or 4.9 percent of revenue. (Australia does not publish an overall tax gap estimate at this time.)
- For each tax gap estimated, the ATO indicates the reliability of the estimate from low to high. For 2013-14, none of the estimates achieved a high level of reliability.

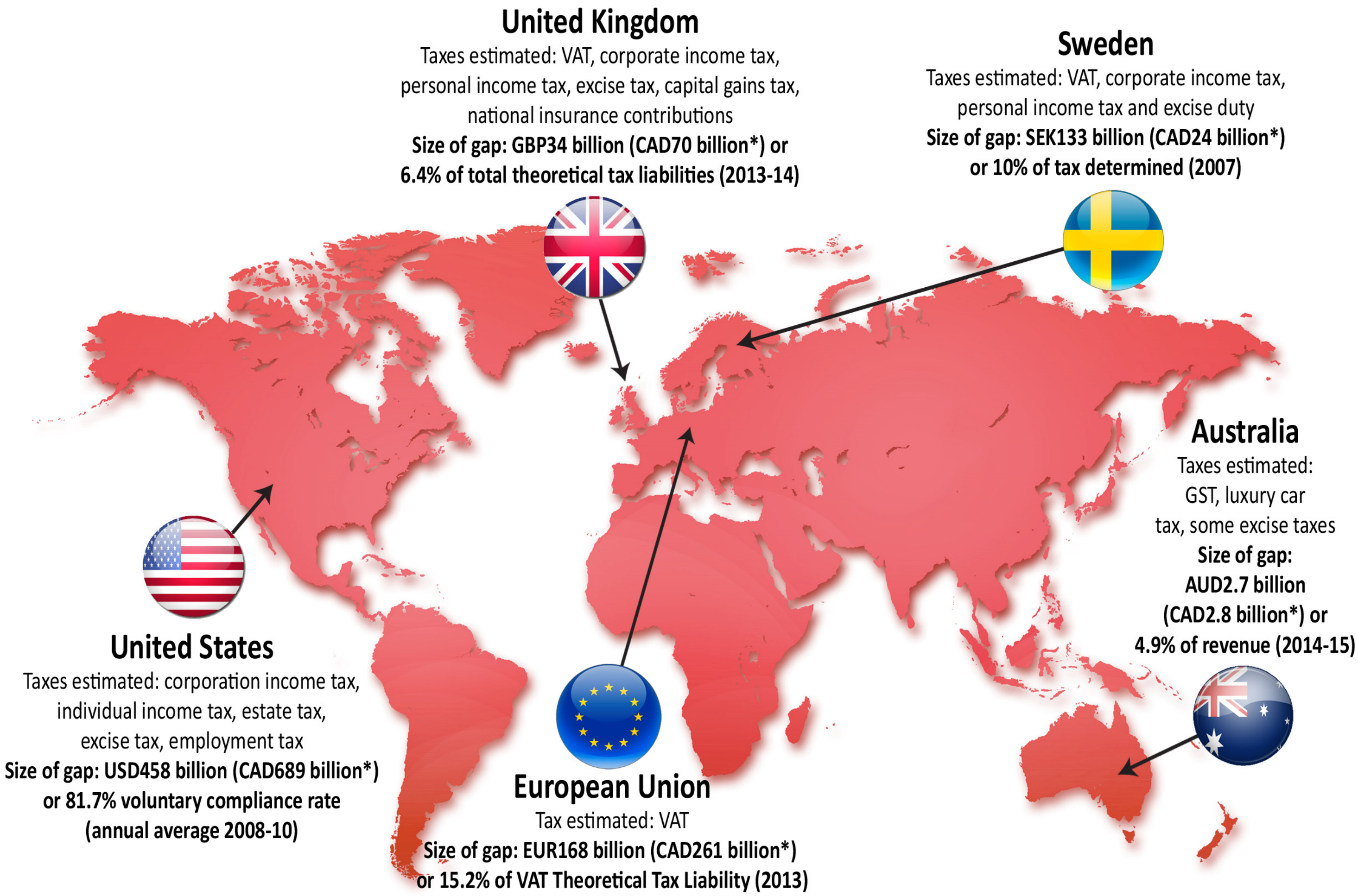
The ATO uses both top-down and bottom-up methods, and a combined approach where possible. Methods used include: audit results, risk registers, and data-matching. These estimates are considered 'compliance' gaps that arise in relation to tax obligations, employer obligations, and administered expenses. The tax gap estimates form part of the suite of high-level measures that track the integrity of the tax system. Insights gained will inform the approach to supporting willing participation in the tax system and ensure that the right amount of revenue is being collected.

The ATO has publicly committed to developing tax gap estimates for all taxes it administers in the future. Several new tax gap estimates were published in tax year 2014-15, including the excise and duty tax gaps related to petroleum and diesel, and beer. The current schedule suggests that estimates will be developed for all remaining taxes by 2017.

The ATO collaborates with an expert panel and other tax gap private sector experts, such as researchers, stakeholders, and academics, in estimating its tax gap.

6 The ATO has also released an estimate of a "withholding gap" (an estimate of the amount of tax that should have been withheld by employers from their employees' salaries and actual withholdings) as well as a "fuel tax credits gap" (the difference between fuel tax credits claimed by taxpayers and the value of claims they were entitled to under the law).

Overview of International Approaches



*Expressed in 2015 Canadian dollars. Inflation adjustments based on World Bank and Eurostat (European Union only) data.

Chapter 4 How Can the Tax Gap Be Used in Tax Administration?

As outlined above, a tax gap estimate should ideally be useful both for a tax administration to improve compliance and for taxpayers to understand what the administrator is doing and how well. Estimating the tax gap may also provide insight into potential weaknesses in existing tax policy and legislative frameworks which can provide the basis for discussions aimed at improving compliance between the tax administration and the relevant legislative body.

Tax gap estimation has benefits and shortcomings that are outlined below.

4.1 Usefulness for Tax Administration Purposes

Tax gap estimation is not a panacea for combatting non-compliance. However, it can play a role in helping tax administrations improve their understanding of the health of the tax system, as well as, providing guidance on which areas may benefit from increased attention.

a. Insight into the Overall Health of the Tax System

Tax gap estimates can provide a general sense of a tax administration's performance at promoting and enforcing compliance. Provided that an estimate is accompanied by a detailed description of the methodology used to arrive at the estimate, publication of a tax gap estimate can improve the openness and transparency of the tax administration.

Where the tax gap estimates are available over a period of time based on the same methodology, they can provide information on whether non-compliance is increasing or decreasing, and highlight the state of voluntary compliance with the tax system. This can provide a degree of insight into the effectiveness of tax laws, tax administration services, and enforcement activities.

However, as a rule, tax gap estimates should be analyzed in conjunction with other information and intelligence on non-compliance to provide a more complete view of the health of the tax system. In general, tax gap estimates, on their own, are poor indicators of a tax administration's short-term performance because the size of the tax gap is not only determined by taxpayer compliance but also by factors beyond the tax administration's control (for example changes to tax policy, economic cycles, and other factors).

Bottom-up estimates, in particular, are problematic from a performance monitoring perspective. This is because bottom-up estimates only capture known and identifiable sources of risk and cannot take into account those that are unknown (for example, a new tax evasion scheme that the tax administrator is not yet aware is in use). Therefore, a small tax gap arrived at using bottom-up methodology may not mean there is truly a small tax gap. In addition, a bottom-up tax gap estimate may increase by virtue of having discovered a new form or area of non-compliance; in such a case, the tax gap would not have actually increased but a previously unknown area of non-compliance would simply now be identifiable and quantifiable.

> Interestingly, the very act of publishing a tax gap estimate may have an impact on compliance behaviour. Some commentators suggest that in circumstances where a tax gap is estimated to be low, indicating that most taxpayers comply with the tax rules, other taxpayers may be encouraged also to comply. However, the opposite may also be true. That is to say, a large estimated tax gap could potentially also discourage compliance among taxpayers if they perceive this indicator to imply a tendency towards non-compliance in the system in general.

The GST/HST gap estimate released today illustrates some of these issues. The estimate suggests an overall GST/HST gap of 5.6 percent of total theoretical GST/HST liability. Further, the estimate demonstrates that tax gap estimates are impacted by factors unrelated to non-compliance: the fluctuations in the GST/HST gap over the period covered by the study can largely be explained by the timing of when input tax credits are claimed, which may be influenced by changes to GST/HST rate or by provinces joining the HST framework.

Other compliance measurement tools also provide insight into the success of a tax administration in improving compliance. For example, the OECD's Forum on Tax Administration in its 2014 report "*Measures of Tax Compliance Outcomes*" discusses the concept of "tax assured" which is a measure of the proportion of the revenue base where there is confidence that the taxpayer is complying with all tax obligations, and in particular that information reported on tax returns is reliable. According to the OECD, "measuring where the tax system is working well provides the right incentives to ensure that the tax administration system is designed to get the right revenue outcomes the first time."

b. Understanding the Composition and Scale of Non-Compliance

Tax gap estimates, used in conjunction with other assessment tools, can also enhance the value of the intelligence held by a tax administrator on the sources of non-compliance within the tax system. By attempting to quantify non-compliance, tax gap estimates can provide a mechanism for comparing compliance among different aspects of the tax system, which could help the administration understand the areas of greatest risk within the system.

While tax gap estimates are not particularly well suited to pinpointing specific cases of non-compliance (i.e. estimates cannot identify a particular taxpayer who may be engaging in tax evasion), they can act as a guide for tax administrators in a variety of more general ways. In particular, information gained through tax gap estimation:

- may be used to refine risk assessment tools to guide tax administrators towards certain aspects of the tax system for further scrutiny;
- may help to inform management decisions and operations strategies including decisions relating to resource allocation; and,
- may contribute to identifying areas where new rules are needed to prevent non-compliance, and/or allow the tax administrator and policymakers to respond to non-compliance more effectively.

4.2 Limitations of Tax Gap Estimation

While tax gap estimates provide some insight into non-compliance within the tax system, they also raise a number of concerns about their precision, timeliness, and cost, as well as the impact that data collection may have on taxpayers. These issues are discussed in more detail below.

a. Precision and Margin of Error

It is widely acknowledged by tax administrators and policy officials, including those who estimate the tax gap, as well as commentators that tax gap estimation is imprecise. Further, the degree of imprecision may often be difficult to quantify.

Two key sources of error arise in the tax gap estimation process:

- **Sampling errors** arise because data is drawn and characteristics are estimated from a smaller population, or sample, rather than the whole population. For example, in the context of tax gap estimation, data from random audits (described in more detail later in this paper) are often used to estimate the tax gap among a given population. Similar to survey research, audit results of a sample used for tax gap estimation may not be fully representative of the issues that would be apparent if audits were performed on the whole taxpayer population.
- **Systematic errors** arise from errors in the assumptions used in calculating the estimate or other errors related to the data used resulting in an estimate that is either too low or too high. For example, top-down methodologies rely on the assumption that national accounts data covers all economic activities. However, if certain concealed economic activities are not captured by the national accounts, the revenue loss caused by those activities would not be covered by the tax gap estimate.

The resulting variations in tax gap estimates can be large. Accordingly, tax gap estimates, and the changes to those estimates over time, must be interpreted recognizing their imprecision. Changes to the estimates can occur not only as a result in changes to the level of non-compliance, but also due to improvements to or deterioration of the data available, the methodology used, and a host of other factors.

b. Timeliness

Tax gap estimates are prepared using historical data. The time lag between the period to which the data refers (the study period) and the development of a tax gap estimate varies depending on the source and quantity of the data used to estimate the tax gap and the related collection and processing time for that data.

- For example, an estimate of the personal income tax gap for a particular tax year would be based on information from tax returns filed in the following year, assessment of those returns in the year or years following, and for a robust estimate, audit and collections data related to that tax year. This information would only be available after a number of years had passed.

A comprehensive tax gap estimate may have a significant time lag from the study period to publication. For example, tax gap estimates for the United States published by the IRS in 2012, were for the 2006 tax year; estimates published in early 2016 were for the 2008 to 2010 tax years.

These time lags have an impact on how tax gap estimates should be interpreted and can be used. Tax laws may have changed and a tax administrator's techniques for improving compliance and combatting non-compliance may have evolved to address certain types of non-compliance during the time between the study period and publication. Consequently, tax gap estimates generally do not reflect the current state of compliance, health of the tax system, or impact of the tax administration on compliance, but rather lag behind it.

c. Random Audit Programs

The cost of tax gap estimation is determined by the comprehensiveness of the program and the techniques used to collect and analyze the data and to develop estimates. Tax gap estimates are particularly costly if they require a random audit program to gather data.

It is important to note that random audit programs are not only used to collect data for tax gap estimation purposes. They also help achieve a variety of other goals including evaluating the validity of existing risk assessment models and identifying new compliance issues for investigation in the future.

In the context of tax gap estimation, random audit programs are generally used to gather data to estimate tax gaps for direct taxes. Random audit programs generally involve selecting a random sample of taxfilers, intended to be representative of the entire tax-filing population, and conducting full compliance audits on the returns filed by those individuals or businesses. The main goal of a random audit program is to identify the extent of non-compliance in the sample with the aim of extrapolating that amount to estimate non-compliance in the whole population. It is important to note that random audits will not identify all instances of non-compliance, which may lead to the underestimation of the tax gap based on this approach alone.

> Random audit programs subject taxfilers, many of whom may be fully compliant, to scrutiny solely for the purposes of data collection. Despite the fact that random audits can yield valuable information from an intelligence perspective, they also impose a significant burden on these taxfilers, and potentially a significant cost as well.

For these reasons, random audits are generally only carried out to the extent required to effectively calibrate risk assessment systems (for example to improve risk based audit programs) or inform analysis of particular sectors in the economy for potential non-audit (preventative) interventions.

A number of countries around the world use random audit programs of varying sizes. As noted above, both the United States and the United Kingdom, for example, use random audit programs. The IRS undertakes approximately 14,000 random audits (out of approximately 138 million individual returns) to help inform its tax gap estimate, while in 2012-13, HMRC conducted approximately 2,600 random audits for individual taxpayers (out of approximately 30 million individual taxpayers). However, when employers and corporations are considered, more than 4,000 random audits were undertaken by HMRC.

As is the case with public opinion surveys, the reliability of the estimate derived from a sample of random audits increases with the number of audits conducted. Consequently, a relatively low number of random audits leads to estimates with a low level of reliability.

Random Audits at the CRA

Random audit programs have been used by the CRA for a number of years beginning with the Core Audit Program (CAP) that was first implemented in 1999. The CAP was a random audit program that alternated annually between Small and Medium Enterprise (SME) audit populations and consisted of 1,500 to 1,700 audits per year. This relatively small number of randomly selected audits only allowed the CRA to produce statistically reliable national and regional non-compliance estimates.

More recently, the CAP was replaced by the SME Research Audit Program, a random audit program designed to enhance the Agency's understanding of the reporting non-compliance of the different SME audit populations (self-employed individuals and corporations) for income tax and GST.

About 4,700 SMEs were selected for full-scope audits with the objective of measuring the non-compliance rates by industry as a basis for monitoring compliance trends over time, and to validate and refine the CRA's risk assessment systems in order to improve file selection and target audit resources more effectively.

Research audits for the unincorporated small business segment of the program have been completed; the results indicate that almost half of the target population made no reporting errors and for about 78 percent of the files that were adjusted, the errors were minor. Results for the incorporated business segment are expected in the summer of 2017, and GST results are expected later.

Chapter 5 The Canadian Perspective

The experience of other countries provides an in-depth view of the number of factors and considerations that inform the development of tax gap estimates. While the CRA's work is still in its early stages, a framework is emerging that will guide us as we progress.

Canada's unique federal-provincial context – and the CRA's role within the federation for tax and benefits administration – presents some additional considerations as we move forward with further studies on tax gap estimation. For example:

- The CRA not only administers and collects taxes for the federal and most provincial and territorial governments but also administers various social and economic development programs on behalf of other government departments, and provinces and territories. Despite this range of responsibilities, at this point, the CRA's view of the tax gap is focused exclusively on the various taxes it administers.

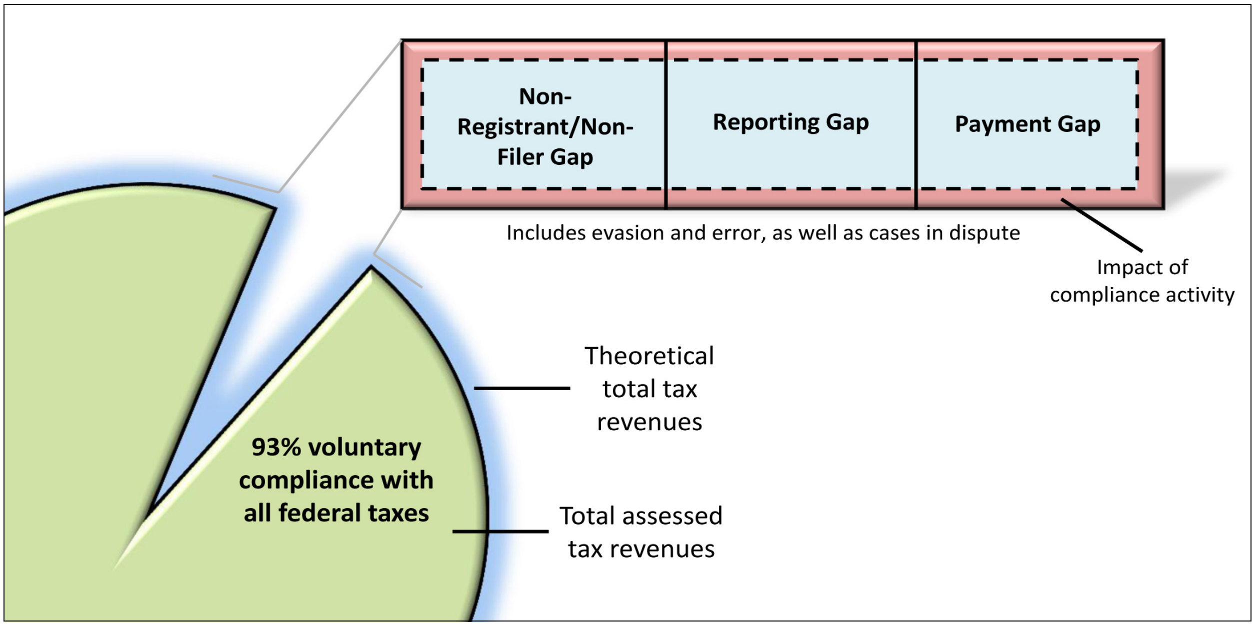
- Further, due to the complexity of incorporating the tax rules and rates of 13 provinces and territories, when discussing direct (or income) tax gaps the CRA will consider federal taxes only.

In this context, Canada will use the following as its broad definition of the tax gap:

> The tax gap is the difference between the taxes that would be paid if all obligations were fully met in all instances, and those that are actually paid and collected.

This definition will apply to personal income taxes, corporate income taxes, GST/HST, excise taxes and other taxes.[7] In general, the CRA's approach to the tax gap encompasses non-compliance related to non-filing, non-registration (in the case of GST/HST), errors, under-payment, non-payment, and unlawful tax evasion. To the extent possible, the CRA's approach will encompass the three main stages of compliance in the tax system: registration and filing, reporting, and payment. These stages will provide a framework for the CRA's exploration of the tax gap as illustrated in the tax gap map below. However, data availability and methodological factors may limit the CRA's ability to examine all stages of the compliance continuum. For example, the GST/HST gap estimate released in conjunction with this paper focuses on the tax gap that arises in respect of non-registration, non-filing and underreporting but does not consider the tax gap arising at the payment stage.

Tax Gap Map for Canada



7 Excise taxes include, for example, taxes applied to petroleum products. Other taxes include the Air Travellers Security Charge.

Chapter 6 Future Directions

This study has demonstrated the insight the concept of the tax gap can provide for tax administrations around the world and the complexities of tax gap estimation. It sets the baseline for the future work of the CRA on the tax gap and will contribute to the Agency's ongoing intelligence gathering with respect to non-compliance.

Following the release of this paper and its companion paper today, it is anticipated that a series of additional papers on other aspects of the tax gap will be published over the next two to three years, approximately every six to eight months. The release of the next paper is planned for early 2017.

> These papers will provide more in-depth analysis of the methodological and practical considerations associated with tax gap estimation, and will further enhance our understanding of how this tool could assist the Agency in administering Canada's tax system.

These papers will take a variety of approaches to analyzing further the methodological and practical considerations associated with tax gap estimation. Examples of the types of papers currently under consideration include:

- **Estimates of particular components of the tax gap:** studies of the tax gap related to a particular type of tax (e.g. personal income tax), a particular stage of the compliance continuum (i.e. registration, filing, reporting, or payment) or a particular subset of taxpayers. These studies will investigate non-compliance within the particular the particular component being analyzed and, depending on the data available, will likely include an estimate of that component of the tax gap. These studies will enrich the CRA's analysis of a variety of aspects of non-compliance and provide additional insight into the concrete work being done on the part of the CRA to combat non-compliance.

- **Discussion papers related to particular components of the tax gap:** studies of the tax gap related to a particular sector of the economy (e.g. the restaurant sector, or the sharing economy) These studies will deepen the CRA's analysis of a particular focus of non-compliance and, depending on the data available, could where appropriate include an estimate of that component of the tax gap.

- **An examination of the international tax gap:** an in-depth study of the international tax gap, focussing on offshore compliance issues from a Canadian perspective. The paper will investigate previous estimates of the international tax gap, and will outline the methodological and practical considerations that come into play when developing an international tax gap estimate. In particular, it will determine whether it is currently possible to estimate an international tax gap for Canada, and will identify the type of data that would assist the CRA in estimating the international tax gap component overall. Given the international experience to date, it is possible that such a paper would not include an estimate of Canada's international tax gap.

As part of the CRA's work on the tax gap to date, officials have had a number of productive and informative discussions with the Agency's international counterparts on the concept of tax gap, its estimation, and the respective experiences of those countries. The CRA intends to continue this collaboration with our international counterparts, as well as the OECD, the International Monetary Fund, and other organizations, as we progress in our work on the tax gap to ensure that the Agency benefits from international best practices. In addition, the CRA will engage with academics and experts in the field to obtain independent analysis of various aspects of tax gap estimation to deepen the Agency's understanding of this tool.

Finally, the CRA also intends to partner with stakeholder organizations to hold a seminar in the course of the next year to engage with experts, academics, and other interested parties. Details on this event will be released in the coming months.