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Fiscal Sustainability Report 2011

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The mandate of the Parliamentary Budget Officer (PBO) is to provide independent analysis to Parliament on the state of the nation's finances, the government's estimates and trends in the Canadian economy; and upon request from a committee or parliamentarian, to estimate the financial cost of any proposal for matters over which Parliament has jurisdiction. This report provides PBO's assessment of the sustainability of federal and provincial-territorial government finances over the long term. PBO will be providing an update of the federal government's medium-term fiscal outlook later this fall.

Long-term economic and fiscal projections are an essential element of budget transparency and sustainability analysis. Responsible fiscal planning needs to take account of challenges not only over the next few years, but also those anticipated over the long term. Indeed, twenty-seven OECD (Organisation for Economic Co-operation and Development) countries produce long-term fiscal sustainability reports. According to OECD (2009), such reports, "offer invaluable signposts to help current governments to respond to known fiscal pressures and risks in a gradual manner, earlier rather than later, and help future governments avoid being forced to adopt sudden policy changes".

To date, Canadian governments have rarely published such analysis. In an effort to address this gap, PBO released its first Fiscal Sustainability Report (FSR) in February 2010. That report represented a first step towards providing a comprehensive assessment of the sustainability of public finances in Canada. While the scope of the first FSR was limited to the federal government, this year's report expands the analysis to include provincial-territorial governments on a consolidated basis. This is an important extension that facilitates assessing fiscal sustainability for a broader government sector as well as examining the implications of existing and alternative federal health and social transfers.

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Summary

This report provides PBO's assessment of the sustainability of the federal and provincial-territorial governments' fiscal structure over the long term. PBO's assessment of fiscal sustainability involves projecting government debt relative to the size of the economy over the long term based on assumptions about current program commitments and tax 'burden' given projected demographic and economic trends. Fiscal sustainability requires that government debt cannot ultimately grow faster than the economy. Further, following the Congressional Budget Office (CBO) in the United States and the Office for Budget Responsibility (OBR) in the United Kingdom, PBO estimates the degree to which this structure is not sustainable using the fiscal gap, which is the amount of fiscal action required to achieve fiscal sustainability.

The focus of this report is on the consolidated federal and provincial-territorial government sector given that, at the national level, the economic impacts of government indebtedness depend on the overall level of debt relative to the size of the economy. However, given the joint nature of financing major social programs (federal transfers amounted to 30 per cent of federal program spending and 21 per cent of provincial-territorial revenues in 2010-11), it is also informative to project intergovernmental transfers over the long term to quantify how their current structure may influence the allocation of fiscal actions across orders of government to achieve sustainability.

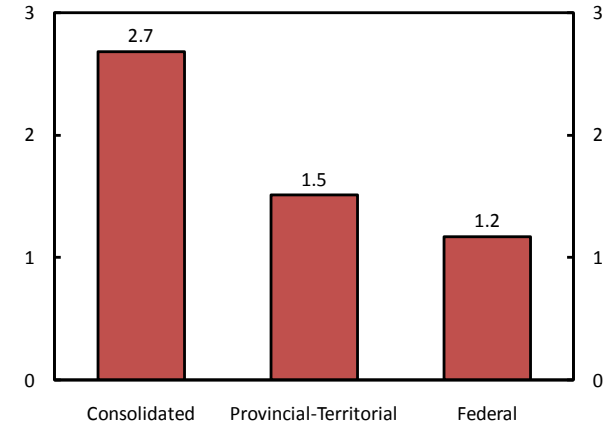
PBO views long-term fiscal projections and fiscal gap estimates as providing an essential perspective for analyzing the state of the nation's finances. While long-term projections can be produced for various horizons, PBO uses a 75-year time horizon in order to fully capture the demographic transition in Canada. Moreover, it is the same time horizon over which the Chief Actuary projects incomes, expenditures and assets in the Actuarial Reports of the Canada Pension Plan. That said, given the large and inevitable uncertainty associated with such long-term projections this report includes a sensitivity analysis that considers different fiscal policy assumptions as well as alternative demographic and economic projections.

Overall, PBO's analysis suggests that the fiscal structure at the federal and provincial-territorial level is not sustainable over the long term. In the baseline projection, PBO estimates that addressing this fiscal gap and restoring sustainability to public finances would require permanent policy actions of 2.7 per cent of gross domestic product (GDP), either to raise taxes, reduce overall program spending, or some combination of both (Summary Figure 1). To put PBO's estimate of the fiscal gap in context, it represents $46 billion of fiscal actions in 2011-12 and the amount of these actions, in dollar terms, would increase over time in line with GDP.

Summary Figure 1

Fiscal Gap Estimates

(Per cent of GDP)



Source: Office of the Parliamentary Budget Officer.

All else equal, changes to assumptions about intergovernmental transfers do not significantly impact the estimated size of the consolidated federal and provincial-territorial fiscal gap; however, these changes would influence the fiscal gaps for each order of government. Assuming that the escalators for the federal Canada Health

Transfer (CHT) and Canada Social Transfer (CST) are maintained at their current legislated rates – growing at 6 and 3 per cent annually – indefinitely, PBO estimates a federal fiscal gap of 1.2 per cent of GDP and a provincial-territorial fiscal gap of 1.5 per cent of GDP.

Caveats

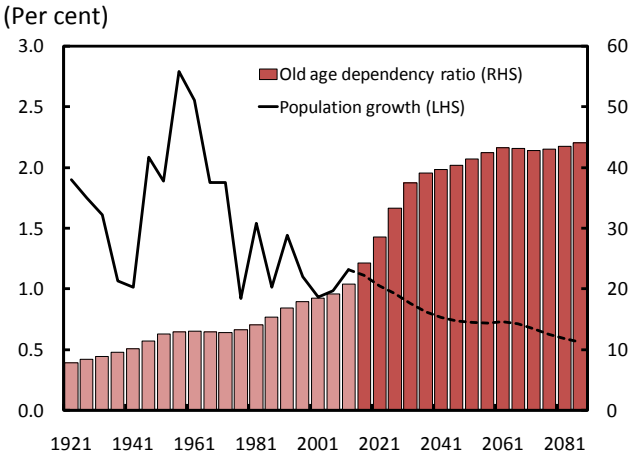
PBO's long-term projections are best viewed as illustrative 'what if' scenarios that attempt to quantify the implications of leaving a government's current fiscal structure unchanged over long periods of time. As such, these scenarios should not be interpreted as predictions of the most likely outcomes. Furthermore, several important issues are beyond the scope of this report and have not been explicitly incorporated in this analysis. For instance, this report does not: consider the outlooks for individual provinces or territories; include local governments or the Canada and Quebec public pension plans (CPP and QPP); identify which fiscal actions should be taken or what a government's long-term debt-to-GDP objective should be; capture any interaction between government debt levels and economic activity; and, assess the implications for intergenerational fairness.

The Demographic Transition and Economic Growth

Although it is important to acknowledge that many elements of a long-term fiscal projection are uncertain, the ageing of Canada's population is not. The demographic transition – already underway – is expected to intensify over the long term, with population growth declining steadily and the ratio of individuals 65 years of age to the population 15 to 64 years of age (often referred to as the old age dependency ratio), rising sharply in the coming decades (Summary Figure 2).

Summary Figure 2

The Demographic Transition

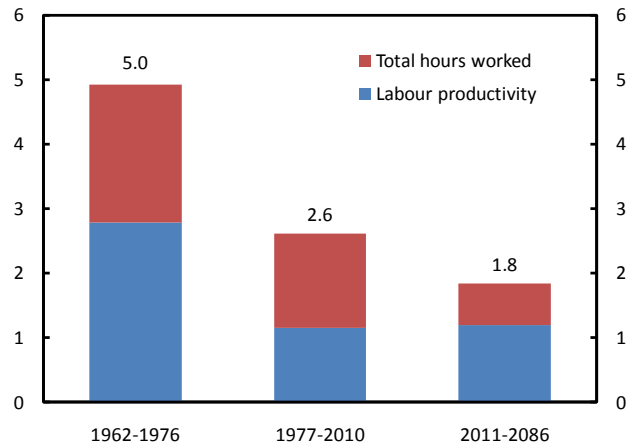


Source: Statistics Canada; Office of the Parliamentary Budget Officer.

The ageing of the population will move an increasing share of Canadians out of their prime working-age and into their retirement years, resulting in slower growth in the labour force. Assuming that the pace of labour productivity growth over the last 34 years continues over the long term, PBO projects that slower labour force growth will reduce annual average real GDP growth from 2.6 per cent observed over 1977-2010 to 1.8 per cent over 2011-2086 (Summary Figure 3).

Summary Figure 3

Average Annual Real GDP Growth



Source: Statistics Canada; Office of the Parliamentary Budget Officer.

Public Finance Implications of Population Ageing

Population ageing will put downward pressure on revenues, as growth in economic activity, and therefore the tax base, slows. At the same time, ageing will put upward pressure on programs whose benefits are mostly realized by Canadians in older age groups, such as health care and elderly benefits. The upward pressure on the costs of these programs will only be partially offset by reduced spending on programs with benefits largely focused on younger age groups, such as education, social and children's benefits.

Assuming that once the economy fully recovers and revenue grows in line with nominal GDP, population ageing along with increased spending on health care and elderly benefits – adjusted for inflation and ageing – are projected to result in a deterioration in the operating balance (i.e., revenue less non-interest spending) from surpluses over the medium term to sizeable deficits over the long term. This projected deterioration begins to feed debt levels, which combined with higher public debt charges result in ever-increasing debt-to-GDP ratios (Summary Figure 4).

Fiscal Sustainability Assessment

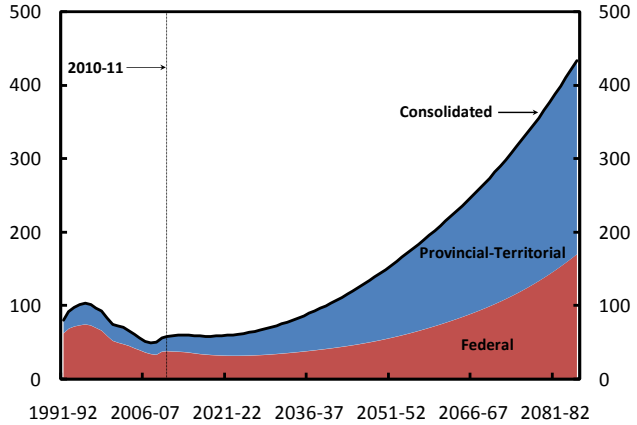
PBO's debt-to-GDP projection indicates that the current federal and provincial-territorial fiscal structure is not sustainable over the long term given projected demographic and economic trends. PBO estimates that permanent and immediate fiscal actions – either through increased taxes or reduced program spending, or some combination of both – amounting to 2.7 per cent of GDP annually would be required to ensure that the net debt-to-GDP ratio does not ultimately rise above its current level.

To put the required amount of fiscal action into historical context, it is helpful to compare the fiscal gap to movements in the estimated structural operating balance over history. Summary Figure 5 shows that the consolidated federal and provincial-territorial government structural operating balance improved by 6.2 percentage points from 1994-95 to 1997-98. This amount of fiscal action is well in excess of the estimated fiscal gap; however, these actions were not permanent and were subsequently reversed over the decade that followed.

Summary Figure 4

Net Debt (Liabilities – Financial Assets)

(Per cent of GDP)

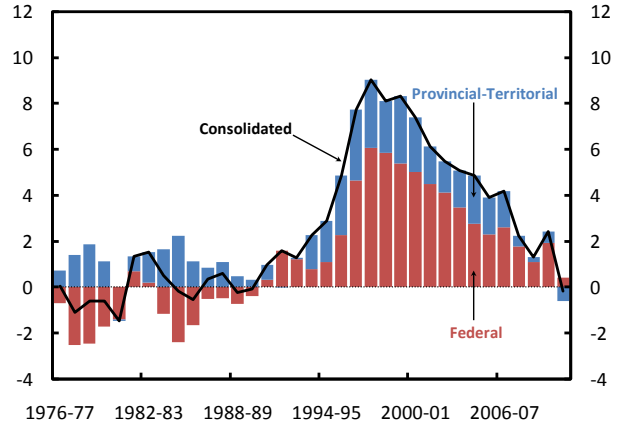


Source: Office of the Parliamentary Budget Officer; Statistics Canada.

Summary Figure 5

Structural Operating Balance

(Per cent of potential nominal income)



Source: Office of the Parliamentary Budget Officer.

Sensitivity Analysis – Key Findings

To assess the sensitivity of PBO's fiscal gap estimates, alternative scenarios are considered based on different fiscal, demographic and economic assumptions and projections. Based on the alternative scenarios examined, PBO finds that:

- Implementing the required fiscal actions may be delayed until the economy has fully recovered without unduly increasing the size of the fiscal gap. However, significant delays in implementing the required actions substantially increase the amount of corrective measures.
    - Delaying fiscal actions by 5 years increases the fiscal gap from 2.7 to 3.0 per cent of GDP.
    - Delaying fiscal actions by 10, 20 and 30 years increases the fiscal gap to 3.4, 4.4 and 5.8 per cent of GDP, respectively.

- While PBO projects federal and provincial-territorial budgetary deficits over the medium term, achieving budgetary balance over this horizon significantly reduces – but does not eliminate – the fiscal gap. Even if both federal and provincial-territorial governments balance their budgets by 2015-16, a fiscal gap of 1 per cent of GDP would persist.
    - Assuming federal and provincial-territorial governments balance budgets over the medium term, their fiscal gaps would be reduced to 0.7 and 0.4 per cent of GDP respectively from 1.2 and 1.5 per cent.

- Under a scenario in which health spending grows in line with only nominal GDP and ageing impacts (i.e., no 'enrichment'), the federal and provincial-territorial fiscal gap would be reduced to 1.2 per cent of GDP. Assuming that the CHT continues to grow at 6 per cent annually, the provincial-territorial fiscal gap would be almost eliminated but a federal fiscal gap of 1.2 per cent would remain.

- The federal fiscal gap would be eliminated if, instead of growing at 6 and 3 per cent respectively beyond 2015-16, the CHT and CST grew in line with nominal GDP. However, to achieve sustainability, provincial-territorial governments would therefore have to implement fiscal actions amounting to at least 2.5 per cent of GDP.

- With a 'younger' population over the long term as a result of higher fertility and increased immigration levels, the federal and provincial-territorial fiscal gap would be reduced to 2.1 per cent of GDP. Federal and provincial-territorial fiscal gaps would be reduced to 1.0 and 1.1 per cent of GDP respectively.

- Higher real GDP growth (+0.5 percentage points) or lower interest rates (-50 basis points) over the long term would reduce but not eliminate the federal and provincial-territorial fiscal gap.
    - This higher real GDP growth would reduce the fiscal gap to 2.4 and per cent of GDP from 2.7 per cent.
    - These lower interest rates would reduce the fiscal gap to 2.6 per cent of GDP from 2.7 per cent.

1 Introduction

In February 2010, PBO released its first Fiscal Sustainability Report (FSR), which committed the PBO to preparing long-term economic and fiscal projections and to providing a FSR on a regular basis. The 2010 FSR was a first step in providing a comprehensive assessment of the sustainability of public finances in Canada and its scope was limited to the federal government. The 2011 FSR has expanded the analytical scope to include, on a consolidated basis, the provincial and territorial governments.

Sustainability Analysis

Medium-term fiscal projections that PBO, the Department of Finance Canada and other organizations regularly produce provide a useful but incomplete description of the budgetary challenges policymakers face. The main limitation of analysis based on these projections is that given the major demographic transition, which is already underway and projected to continue over the next several decades, they cannot be used to determine whether a government's fiscal structure is *sustainable* over the long term. Fiscal sustainability requires that government debt cannot ultimately grow faster than the economy.

To assess fiscal sustainability, PBO projects government debt-to-GDP ratios over the long term based on assumptions about current program commitments and tax 'burden' given projected demographic and economic trends. In addition, PBO estimates the degree to which this current fiscal structure would need to be adjusted to achieve sustainability – the fiscal gap. Although long-term debt projections serve as a useful signal and a gauge of fiscal sustainability, it is important to recognize that they are – as is the case with all long-term projections – subject to considerable uncertainty. That said, as the Office for Budget Responsibility (OBR) rightly cautions in its recent FSR, "policymakers need to be aware of these uncertainties, but should not use them as an excuse for ignoring the long-term challenges that lie ahead."

Key Innovations in FSR 2011

Expanding the scope of the sustainability analysis to include the provincial-territorial sector has necessitated a change in accounting frameworks. To put the federal and provincial-territorial government sectors on a consolidated basis (i.e., eliminating all transfers between sectors) and to ensure consistency between federal and provincial-territorial government sectors, PBO has moved from the Public Accounts to Statistics Canada's (preliminary) Government Finance Statistics (GFS). PBO has also improved its projection of the federal effective interest rate on debt to better reflect the composition of interest-bearing debt. Further, PBO has expanded its sensitivity analysis to include alternative scenarios with different fiscal and demographic assumptions and projections.

The focus of this report is on the consolidated federal and provincial-territorial government sector given that, at the national level, the economic impacts of government indebtedness depend on the overall level of debt relative to the size of the economy. However, given the joint nature of financing major social programs and the roles and responsibilities of federal and provincial-territorial governments, it is also informative to project intergovernmental transfers over the long term to illustrate and quantify how their current structure may influence the *allocation* of fiscal actions across orders of government that are required to achieve sustainability.

Overview

The remainder of this report is organized into 4 sections. Section 2 discusses the fiscal projection methodology and assumptions. Section 3 presents PBO's baseline revenue and program spending projection. Section 4 provides PBO's fiscal sustainability assessment and Section 5 discusses the results of the sensitivity analysis. Several annexes are also included that provide additional information and technical details.

2 Long-term Fiscal Projection Methodology and Assumptions

This section discusses the accounting framework, projection methodology and assumptions for PBO's long-term fiscal projections. Annex A provides a summary of key projection assumptions and results.

PBO's assessment of fiscal sustainability involves projecting government debt-to-GDP ratios over the long term based on assumptions about current program commitments and tax 'burden' given projected demographic and economic trends (see Annexes B and C respectively). More specifically, once the economy fully recovers, PBO assumes that government revenue grows in line with nominal GDP; and, that the current spending structure (relative to nominal GDP) is maintained but adjusted to account for projected changes in the demographic structure as well as assumed program enrichment.

Government Finance Statistics (GFS) Accounting Framework

Federal and provincial-territorial governments' financial statements and projections are presented on a Public Accounts basis. However, as Statistics Canada (2010a) notes, "there is a lack of consistency across jurisdictions and over time" given differences in organizational structures and accounting and reporting practices, which are determined by individual governments. To address this inconsistency Statistics Canada developed the Financial Management System (FMS).

However, recent changes in accounting systems by governments in Canada necessitate moving from the FMS to an accrual-based accounting system.[1] As a result, Statistics Canada terminated financial statistics based on the FMS – with 2008-09 as the last data point – and is in the process of moving to the internationally accepted accrual framework for government finance statistics, developed by the International Monetary Fund (IMF), the GFS 2001. Statistics Canada expects that it will take some years to provide detailed GFS-based statistics. However, in the interim, Statistics Canada has decided to release quarterly GFS data using Canada's System of National Accounts (CSNA), which "already compiles some government data on an accrual basis and therefore offers an excellent foundation to produce preliminary estimates of government data on a GFS basis". Therefore, given the lack of current data from the FMS, this report uses Statistics Canada's preliminary GFS-based statistics (available to 2010-11) and the underlying CSNA statistics on which they are based. These data ensure consistency between federal and provincial-territorial government sectors and can be used to put the federal and provincial-territorial government sectors on a consolidated basis.[2]

The CSNA, however, does not explicitly identify provincial-territorial government spending on health, rather it combines it with spending on social services to form a sub-sector in the provincial-territorial government sector. As a result, PBO uses data from the Canadian Institute for Health Information (CIHI) for provincial-territorial government health spending. A residual spending category ensures that overall provincial-territorial spending matches the CSNA total.

Further, the treatment of provincial-territorial governments on a consolidated basis at the national level ensures consistency in underlying economic assumptions over the projection horizon. Even if accounting practices were consistent across jurisdictions, the economic assumptions underlying the fiscal forecasts in provincial and territorial budgets would likely be inconsistent – in aggregate – with the assumptions at the national level used to develop the federal fiscal projections.

[1] The FMS is a 'modified-cash' based system, whereas governments in Canada have recently moved to an 'accrual' based system. IMF (2001) notes that under an accrual-based system "flows are recorded at the time economic value is created, transformed, exchanged, transferred, or extinguished."

[2] Consolidation involves eliminating all the transfers between sectors as well as inter-sectoral holdings of government assets and liabilities.

Projection Methodology and Assumptions

Own-source Revenue

This report adopts the same approach as PBO (2010b) to project government revenue over the long term. That is, beyond the medium term – when the economy is operating at its potential capacity – consolidated federal and provincial-territorial own-source revenues (i.e., revenues excluding intergovernmental transfers[3]) are assumed to remain constant as a share of nominal GDP – the broadest measure of the tax base. This is a standard assumption used by many countries that have produced fiscal sustainability reports. While this assumption is consistent with the flat rate structures of some of the largest revenue streams (i.e., taxes on goods and services and corporate income[4]), it implies that future policy action must occur to maintain the personal income tax (PIT) 'burden' faced by individuals (see Box 2-1). The assumption that federal and provincial-territorial own-source revenue is held constant as a share of nominal GDP can therefore be viewed as an assessment of the adequacy of the current economy-wide tax 'burden' to finance government spending over the long term.

The medium-term outlook for federal revenue is based on PBO's June 2011 Economic and Fiscal Outlook which has been updated to include measures from the June 2011 federal budget. As the economy recovers over the medium term, growth in federal own-source revenue is projected to outpace growth in nominal GDP. Provincial-territorial own-source revenue (relative to nominal GDP) is assumed to rebound from a cyclical low in 2010-11 in proportion to the increase in federal revenue over the medium term. This assumption results in provincial-territorial own-source revenue (relative to nominal GDP) that is slightly higher than levels observed just prior to the recent recession (i.e., in 2007).

Box 2-1: Projecting Personal Income Tax Revenue over the Long Term

PBO (2010b) notes that due to the progressivity of Canada's PIT system and given that its brackets are indexed only to inflation (at the federal level and in some provinces), the real income growth that is expected over time will result in PIT revenues rising relative to GDP over the projection period, unless specific policy actions are taken. Further, PIT revenues over the long term may also be boosted somewhat due to the withdrawal of Registered Retirement Savings Plan (RRSP) and Registered Pension Plan (RPP) assets by retiring individuals that is likely to occur over the projection period due to the ageing of the population. Studies by the OECD (2004), "Long-term Budgetary Implications of Tax-Favoured Retirement Savings Plans" and the Department of Finance (2003), "Long-run projections of the Tax Expenditure on Retirement Savings" in Tax Expenditure and Evaluations 2003, however, indicate that the revenue effect of RRSP and RPP withdrawals will likely be small. This effect, however, may be tempered by the increasing use and expansion of Tax-Free Savings Accounts (TFSAs), which earn tax-free investment income.

Program Spending

PBO uses a relatively standard approach to project demographically-sensitive spending categories. This approach has been used by the CBO and the OECD to project health expenditures.[5] The general approach decomposes growth in nominal spending on a given category (*EXP*) into its three key drivers, namely: age composition (*AGE*); nominal income (*GDP*); and, an 'enrichment' factor (*X*).[6]

[3] In its entirety, federal revenue is essentially 'own-source'. In 2010-11, transfers from other government sectors (i.e., provincial-territorial governments) constituted 0.4 per cent of total federal revenues. In contrast, transfers from other government sectors amounted to 21.2 per cent of (total) provincial-territorial government revenues. The vast majority (99.8 per cent) of government transfers to provincial-territorial governments are provided by the federal government.

[4] Under stable long-run economic conditions, EI premium revenues should also grow in line nominal GDP. However, over the decade beyond 2015-16, and based on PBO's baseline economic projection, EI premium rates would be projected to decline in order to restore balance to the EI account.

[5] See Annex B in PBO (2010a) which provides a more detailed discussion of the approach used by the CBO.

[6] In some studies this factor is called *excess cost growth* or *residual cost growth*.

$$EXP_t = EXP_{t-1} \cdot \left(\frac{AGE_t}{AGE_{t-1}} \right) \cdot \left(\frac{GDP_t}{GDP_{t-1}} \right) \cdot (1 + X_t)$$

The age composition factor, for each category, attempts to capture the impact of changes in the population's age structure over time. Specifically, it is constructed as an index of the weighted (with weights ω_i) shares of age groups (Pop_i) in the population (Pop).

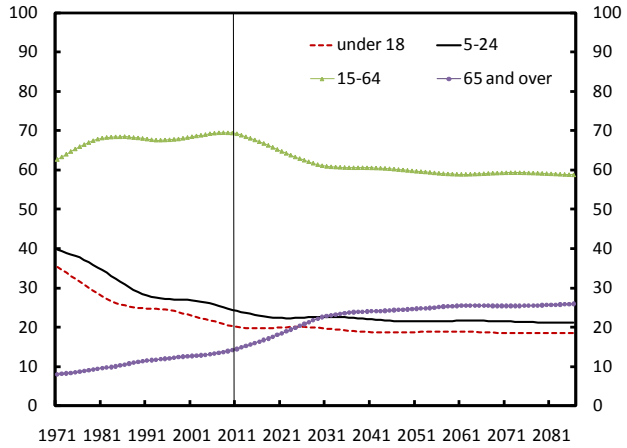
$$AGE_t = \sum_i \left[\omega_i \cdot \left(\frac{Pop_{i,t}}{Pop_t} \right) \right]$$

Figure 2-1 shows the population shares for the age groups considered.

Figure 2-1

Population Shares for Key Age Groups

(Per cent of total population)



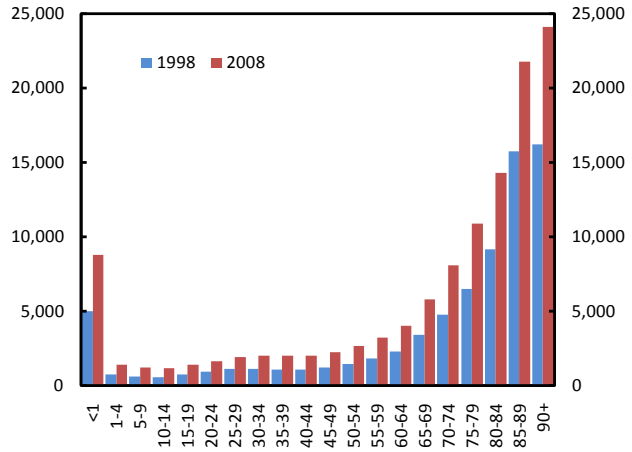
Source: Office of the Parliamentary Budget Officer; Statistics Canada.

For categories in which benefits or spending are well targeted, for example federal spending on elderly benefits, the weights for age groups 65 and over are set equal to one and the weights for all other age groups are set equal to zero. In the case of provincial-territorial government health spending, and following PBO (2010b), the weights are based on health expenditure data on a per capita age-group basis produced by CIHI (Figure 2-2).[7]

Figure 2-2

Provincial-Territorial Government Health Expenditures by Age Group, 1998 and 2008

(Dollars per capita)



Source: Canadian Institute for Health Information.

Table 2-1 provides a summary of the demographically-sensitive expenditure categories along with their targeted age groups and long-term enrichment assumptions in the baseline projection (Box 2-2 describes some key medium-term spending assumptions). Following PBO (2010b), the enrichment factor for provincial-territorial health spending is set equal to its long-term historical average.[8] For federal spending on elderly benefits, PBO continues to assume that that the average inflation-adjusted payment per beneficiary is only partially indexed (at 50 per cent) to growth in real GDP per capita.[9] This assumption implies that the enrichment factor for elderly benefits (as represented in the equation above) is negative. While the existing program does not include indexation to real income growth, PBO believes that recipients will benefit at least somewhat from

[7] CIHI provides data for provincial-territorial government health expenditures per capita by age group from 1998 to 2008. Following PBO (2010b), 1998 is used as the base year in constructing the age composition factor over history. Over the projection horizon 2011 to 2086, expenditures per capita by age group for 2008 are used to construct the weights.

[8] PBO (2010b) estimated the enrichment factor for health spending based on the period 1976-2007. In October 2010, CIHI released data that was updated to include 2008 and forecasts for 2009 and 2010. PBO treats CIHI's near-term forecasts as 'historical' data for the purposes of calculating the enrichment factor and extrapolating health spending over the projection horizon.

[9] Full indexation to real GDP per capita growth would result in an enrichment growth factor equal to zero.

the growth in living standards experienced by the remainder of the population over the 75-year projection horizon. Lastly, the long-term enrichment factor for EI is set such that the average benefit payment grows in line with nominal wages (i.e., at inflation plus labour productivity growth).

Table 2-1

Key Spending Categories

(Per cent)

	Share of program spending in 2010-11	Age groups	Long-term enrichment growth
Provincial-Territorial government:			
Health	34.6	all ages[a]	+0.4[b]
Education	22.1	ages 5-24	0.0
Social benefits[c]	6.0	ages 15-64	0.0
Federal government:			
Elderly benefits	14.8	ages 65+	-0.5[d]
Employment Insurance	7.1	labour force 15+	+0.2[e]
Children's benefits	5.3	ages 0-17	0.0

Source: Office of the Parliamentary Budget Officer.
Note: [a] CIHI per capita expenditure data by age is provided for 20 ages groups from less than 1 year old to 90+ years old.
[b] Estimated enrichment growth over the period 1976-2010.
[c] Includes social assistance, workers' compensation and other social insurance benefits.
[d] Ensures that inflation-adjusted benefits increase at half the rate of real GDP per capita growth.
[e] Ensures that inflation-adjusted benefits increase at the rate of labour productivity growth.

For spending on education, social benefits and children's benefits, the enrichment factor is assumed to be zero over the long term. This implies that relative to the size of the economy, spending on these categories will increase or decrease over the long term in line with changes in the age structure of the population. This means that spending targeted at relatively older (younger) age groups will increase (decrease) relative to GDP over the long term. Further, this assumption implies that inflation-adjusted spending per beneficiary is fully indexed to growth in real GDP per capita.

Consistent with PBO (2010b), the remainder of program spending – excluding intergovernmental transfers – is assumed to grow in line with nominal GDP over the long term for both federal and provincial-territorial government sectors.

Box 2-2: Medium-term Spending Assumptions

For the federal government, the medium-term spending outlook is based on PBO's June 2011 Economic and Fiscal Outlook, which has been updated to include measures from the 2011 federal budget. Over the medium term, elderly benefits grow in line with the Consumer Price Index (CPI) and the population 65 years of age and over; direct program spending is assumed to grow, on average, at just over 1 per cent annually.

For the provincial-territorial government sector, the medium-term outlook for spending on health, education and social benefits is constructed using the long-term projection approach. However, adjustments are made to account for over- and under-projections in 2010-11. As a result, the adjustments to growth in spending build in a degree of 'restraint' (i.e., projected spending growth that is lower than would be the case based exclusively on the long-term projection approach). These adjustments diminish over the medium term, after which growth is determined exclusively using the long-term projection approach and the assumptions presented in Table 2-1. Provincial-territorial investment spending (i.e., acquisition of non-financial capital) is assumed to grow in line with nominal GDP, after accounting for the impact of stimulus spending in 2010-11. Similar to the assumption for the federal government sector, all other program spending is assumed to grow, on average, at just over 1 per cent annually over the medium term.

Intergovernmental Transfers

Consolidating federal and provincial-territorial government sectors at the national level eliminates – arithmetically – intergovernmental transfers between the two sectors. Further, at the national level the economic impacts of government indebtedness depend on the overall level of debt relative to the size of the economy.[10] However, given the joint nature of financing major social programs and the roles and responsibilities of federal and provincial-territorial governments, it is also informative to project intergovernmental transfers over the long term to illustrate and quantify how their current structure may influence the *allocation* of adjustments across orders of government to achieve fiscal sustainability. Therefore, this report provides long-term projections of federal and provincial-territorial intergovernmental transfers under the assumption that the current structure is maintained indefinitely.

That is, beyond the 2013-14 expiry date of the current legislation, PBO assumes that the CHT and CST continue to increase annually at their current legislated escalators of 6 and 3 per cent respectively.[11] This practice is consistent – albeit extended over a much longer horizon – with the planning assumptions in the federal government's 2011 budget, which extends the current escalators beyond 2013-14 out to 2015-16. Alternative CHT and CST structures are examined in the sensitivity analysis. Equalization and Territorial Formula Financing and other (i.e., non-major) federal transfers, as well as transfers from provincial-territorial governments to the federal government, are assumed to grow in line with nominal GDP over the long term.

Debt Accounting

In this report, the stock of debt that is used to assess fiscal sustainability is based on the GFS concept of net financial worth, which is defined as financial assets less liabilities. Rearranging these terms (i.e., liabilities less financial assets) results in 'net debt' which is typically the concept used to assess fiscal sustainability.[12] For example, the recent *Fiscal Sustainability Report* by the OBR provides long-term fiscal projections and fiscal gap estimates based on a net debt concept as opposed to a net worth concept, which includes all government assets (financial and non-financial).

Revenue and program spending form a government's 'operating' balance.[13] The operating balance less interest payments is equivalent to net lending (*NL*) in the GFS framework and mirrors the Public Accounts concept of the budgetary balance. Federal and provincial-territorial governments are assumed to finance any budgetary deficits (i.e., net borrowing from other sectors in the economy) by issuing interest-bearing debt.[14] Similarly, any budgetary surpluses (i.e., net lending to other sectors in the economy) are used to pay down interest-bearing debt. In addition, it is assumed that there are no changes to the initial stock of financial assets and non-interest-bearing debt.

[10] The economic impacts would also depend on the finances of local governments as well as the Canada Pension Plan (CPP) and Quebec Pension Plan (QPP). These government sectors are, however, beyond the scope of this report.

[11] The baseline projection in PBO (2010b) assumed that federal CHT and CST would grow in line with, respectively, provincial-territorial health and social spending beyond the medium-term projection horizon which ended in 2013-14, coinciding with the expiry of the current legislation.

[12] The assessment of fiscal sustainability in PBO (2010b) was based on a broader concept of federal debt, which includes non-financial assets. At the federal level, non-financial assets (i.e., non-residential structures, machinery and equipment, inventories and land) are relatively small in comparison to liabilities (e.g., in 2010-11 they amounted to just over 7 per cent of federal liabilities). However, at the provincial-territorial level, non-financial assets relative to liabilities are much larger – in 2010-11 they amounted to approximately 37 per cent of provincial-territorial liabilities. This report, however, assumes that non-financial assets would not be liquidated to reduce current liabilities or to finance future deficits and therefore excludes them from its assessment of fiscal sustainability.

[13] In the GFS framework, the definition of the operating balance includes interest payments. To mirror the Public Accounts definition, the operating balance in this report is re-defined as revenue less program spending, which excludes (gross) interest payments but includes the GFS category of acquisition of non-financial assets (i.e., government capital formation).

[14] Interest-bearing debt in this report is defined as the sum of the GFS liabilities consisting of securities, loans and technical reserves.

These assumptions result in the following evolution for a government's net debt:

$$Net\ Debt_t = Net\ Debt_{t-1} — Net\ Lending_t$$

Feedback from Government Finances to the Economy

To ensure a stable economic backdrop, and consistent with baseline projections in CBO (2011) and OBR (2011), PBO's long-term fiscal projections are constructed under the assumption that there is no feedback to the economy. However, rising debt ratios beyond the medium term could reduce GDP and or put upward pressure on interest rates (Box 2-3). Incorporating these effects would simply accelerate any projected increases in debt-to-GDP ratios.

Box 2-3: Impacts of Debt-to-GDP Accumulation

Permanent increases in government debt relative to the size of the economy can impact the economy through various channels (e.g., see Macklem, Rose and Tetlow (1994)). First, a permanent increase in the debt ratio can lead to reduced domestic savings if private saving does not increase sufficiently to offset the decrease in public saving (i.e., the increased budget deficits). Reduced domestic savings results in lower private investment and ultimately lower GDP and or increased borrowing from abroad, leading to increased foreign indebtedness. The increase in foreign indebtedness would ultimately have to be financed by higher trade surpluses and reduced domestic consumption. Second, a permanent increase in the debt-to-GDP ratio requires that a government run a larger operating surplus, financed through increases in tax rates and/or reductions in program spending, resulting in lower consumption, investment and GDP as households and firms respond to the required fiscal measures. Lastly, an increase in government debt relative to GDP to high levels could increase the uncertainty about future fiscal actions, resulting in an increase in the interest rate risk premium on government debt.

CBO (2011) and OBR (2011) also note that higher government debt levels can restrict the ability of policymakers to respond to unanticipated economic and financial developments. Further, debt-to-GDP accumulation can have important implications for intergenerational equity (e.g., see Statistics Canada's 1998 volume, *Government Finances and Generational Equity*.

3 Long-term Revenue and Spending Projection

The major demographic transition that is underway in Canada will strain governments' finances over the next several decades. During this time, population ageing will move an increasing share of the population out of their prime working-age years and into their retirement years. This will put downward pressure on revenues, as growth in economic activity, and therefore the tax base, slows. At the same time, ageing will put upward pressure on programs whose benefits are entirely or disproportionately realized by Canadians in older age groups, such as elderly benefits and health care. The upward pressure on the costs of these programs will only be partially offset by reduced spending (as a share of GDP) on programs with benefits largely focused on younger age groups, such as education, social services and children's benefits.

This section presents the baseline revenue and program spending projections for the federal and provincial-territorial governments.

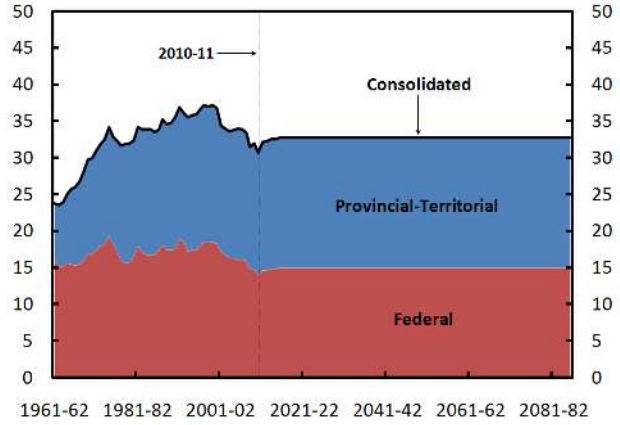
Consolidated Federal and Provincial-Territorial Government Revenue

On a consolidated basis PBO projects that, as the economy recovers, federal and provincial-territorial revenue will rebound from 30.7 per cent of GDP in 2010-11 to 32.7 per cent of GDP in 2015-16 (Figure 3-1). As discussed in Section 2, this revenue ratio is assumed to be maintained over the longer term. At 32.7 per cent of GDP, this ratio is only slightly higher than its historical average of 32.5 per cent observed over the past fifty years (1961-62 to 2010-11).

Figure 3-1

Consolidated Federal and Provincial-Territorial Revenue

(Per cent of GDP)



Source: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: Excludes intergovernmental transfers received by federal and provincial-territorial government sectors.

At the federal level, the increase in the revenue ratio also reflects increases in Employment Insurance (EI) premium rates that are required to balance the EI program over time. However, the impact of this policy action is dampened by the legislated reductions in the general corporate income tax rate to 16.5 per cent on January 1, 2011 and to 15.0 per cent on January 1, 2012. As the economy reaches its potential, federal revenue begins to stabilize at 15 per cent of GDP and then is assumed to remain constant as a share of GDP over the long term. The assumed federal ratio is almost 2 percentage points of GDP below its average over the past fifty years (1961-62 to 2010-11).

As discussed in Section 2, provincial-territorial own-source revenue (relative to nominal GDP) is assumed to rebound in proportion to the increase in federal revenue. Over the long term, provincial-territorial own-source revenue relative to GDP is assumed constant at 17.8 per cent, which is well above its long-term historical average. In contrast to the (relative) stability of the federal revenue ratio over history, the provincial-territorial revenue ratio has more than doubled since 1961-62. This increase primarily reflects the financing of the development and expansion of health and

education programs that occurred in the 1960s and 1970s. Since 1980-81, provincial-territorial own-source revenue has remained relatively stable averaging 17.5 per cent of GDP, slightly lower than its assumed level over the long term.

Federal and Provincial-Territorial Program Spending

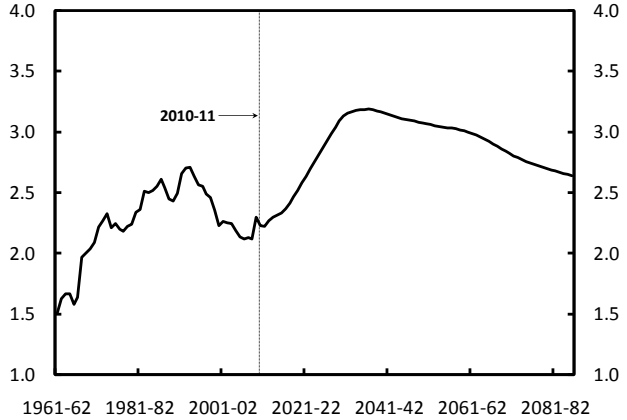
Federal Elderly Benefits

As the economy recovers, federal spending on elderly benefits is projected to grow in line with the number of recipients (i.e., the population 65 and over) and the average benefit payment, which is assumed to increase in step with the Consumer Price Index. Over the longer term, however, the projection includes an additional increase assumed to equal one half of the growth in real GDP per capita (see Table 2-1 in Section 2). PBO's projection of elderly benefits (Figure 3-2) results in an increase in the cost of the program of almost 1 per cent of GDP from 2015-16 (2.3 per cent of GDP) to 3.2 per cent of GDP by 2035-36. Elderly benefits are then projected to remain at around 3 per cent of GDP for the following 25 years, before declining as growth in the population 65 and over begins to decrease, falling to 2.6 per cent of GDP.

Figure 3-2

Federal Elderly Benefits

(Per cent of GDP)



Source: Office of the Parliamentary Budget Officer; Statistics Canada.

Federal Employment Insurance and Children's Benefits

Over the long-term projection horizon, PBO's approach and assumptions ensure that the overall average EI benefit payment grows in line with the average wage. With the projected number of beneficiaries growing in line with the labour force, this results in total spending on EI benefits remaining relatively stable at approximately 1 per cent of GDP over the long term.[15] Children's benefits are projected to grow with nominal GDP and the share of the population under 18 years of age. As a result, spending per child, on an inflation-adjusted basis, grows in line with real GDP per capita over the long term. As the share of the population under 18 declines modestly over the projection horizon, children's benefits are projected to decline from 0.8 per cent of GDP in 2010-11 to 0.6 per cent over the 75-year period.

Provincial-Territorial Health Spending

Provincial-territorial government health spending comprises expenditure on: hospitals and other institutions; physicians and other professionals; drugs; capital; public health; administration; and, other spending.[16]

As discussed in Section 2, PBO uses a standard approach to project health expenditures, in which the age structure of the population; income; and, an enrichment factor drive the growth in health spending over the long term. The long-term enrichment factor used in this report (assumed at 0.4 per cent annually) is based on the average growth over the period 1976 to 2010. The longer sample period is chosen to average out the effects of episodes of high and low growth in health expenditures.

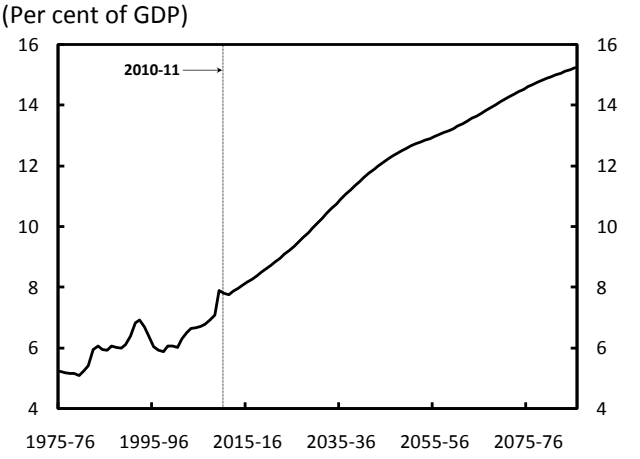
As a result of population ageing and given the assumed enrichment growth, provincial-territorial government health spending as a share of GDP is

[15] Implicitly this approach assumes that the share of wages and salaries in GDP remains stable over the long-term projection horizon.
[16] See CIHI (2010) for a description of these categories.

projected to rise from 7.8 per cent in 2010-11 to 12.7 per cent of GDP in 2050-51 and 15.2 per cent in 2085-86 (Figure 3-3). The (annual) contribution to growth in provincial-territorial health spending from population ageing is projected to rise gradually, peaking in 2032 at 1.2 percentage points from 0.9 percentage points in 2010.[17] From its peak in 2032, the ageing factor is projected to decline toward zero over the long term.

Figure 3-3

Provincial-Territorial Health Spending



Source: Office of the Parliamentary Budget Officer; Canadian Institute for Health Information.

PBO's projected increase in provincial-territorial health spending remains in line with other long-term projections of health expenditures. Jackson and King (2000) and TD Economics (2009) projected health spending of 11 and 12 per cent of GDP respectively by 2040. More recent analysis conducted by the C.D. Howe Institute (Dodge and Dion (2011)) projects total (i.e., public and private) health spending to grow at 6.4 per cent annually, on average, over the period 2012-2031. Over the same period, PBO's projection of provincial-territorial government health spending results in average annual growth of 5.3 per cent.

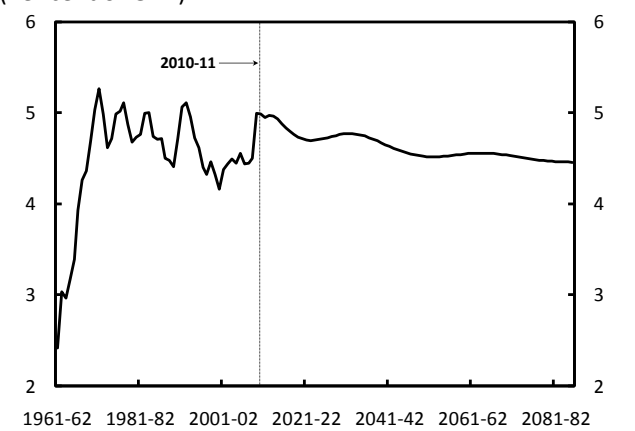
Provincial-Territorial Education Spending

Spending on education by provincial-territorial governments comprises: general government transfers to schools; outlays made by the education subsector (excluding capital consumption allowances and interest payments); and, capital spending.

As growth in the population aged 5-24 falls relative to that of the overall population, growth in education spending remains below growth in the economy (Figure 3-4). There are however periods during which the population aged 5-24 grows faster than the overall population (2023-24 to 2031-32 and 2053-54 to 2063-64), reflecting the impact of the children and grandchildren of the baby boom generation having children of their own. Over the projection horizon, provincial-territorial government education spending as a share of GDP is projected to trend down gradually from 5.0 per cent in 2010-11, to around 4.5 per cent of GDP in 2068-69.

Figure 3-4

Provincial-Territorial Education Spending



Source: Office of the Parliamentary Budget Officer; Statistics Canada.

[17] It is sometimes argued that the rise of life expectancy reflects a better health status of the population (i.e., *compression of morbidity)* and thus should lead to lower growth in health spending as the impact of ageing on health spending is delayed. Due to the difficulty of estimating this impact, PBO does not take it into account in its projection of health spending. See OECD (2006) and Hogan and Hogan (2002) for a detailed discussion of the relationship between ageing and health status and its implication for health spending.

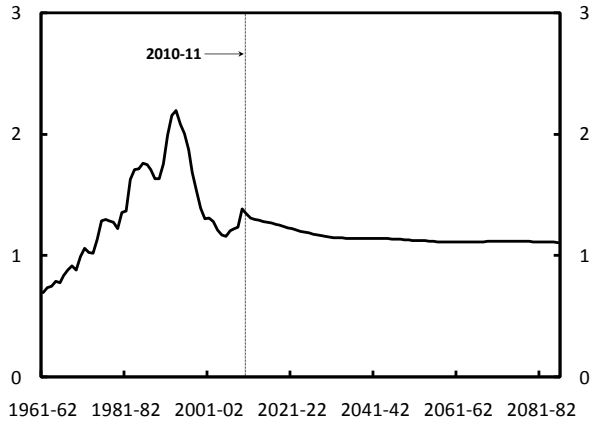
Provincial-Territorial Spending on Social Benefits

Provincial-territorial spending on social benefits includes social assistance payments, workers' compensation benefits and other social insurance benefits. As the demographic transition progresses, growth in the prime working-age population (defined as 15 to 64 years of age) remains below that of the overall population, keeping growth in spending on social benefits below growth in the economy. As the baby-boom generation dies off, the population age structure begins to stabilize and spending on social benefits settles at 1.1 per cent of GDP, slightly lower than the initial level of 1.3 per cent of GDP observed in 2010-11 (Figure 3-5).

Figure 3-5

Provincial-Territorial Spending on Social Benefits

(Per cent of GDP)



Source: Office of the Parliamentary Budget Officer; Statistics Canada.

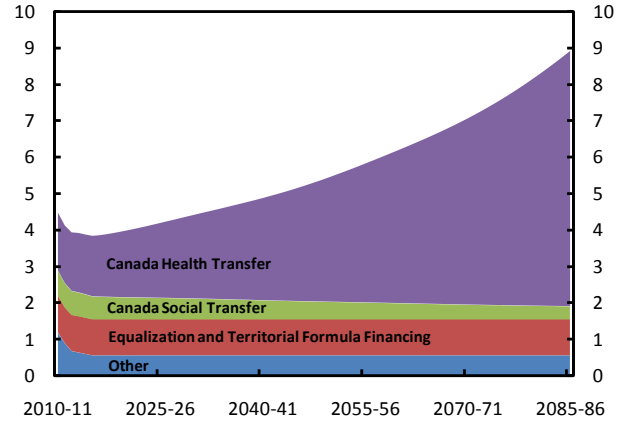
Intergovernmental Transfers

On the whole, as the economy recovers federal transfers to provincial-territorial governments are projected to decrease somewhat, relative to the size of the economy, reflecting absolute declines in 'other' transfers and relatively slower growth in the CST (Figure 3-6). Over the longer term, Equalization, Territorial Formula Financing and other transfers (net of Alternative Payments for Standing Programs (APSP)) are maintained at 1.5 per cent of GDP (1.8 per cent of GDP without APSP). The CST is projected to decrease from 0.7 to 0.4 per cent of GDP, reflecting its slower growth relative to the growth in the economy. The assumed growth in the CHT results in a projected increase of over 5 percentage points of GDP over the long term from 1.6 per cent of GDP in 2010-11 to 7.0 per cent of GDP in 2085-86.

Figure 3-6

Federal Transfers to Provincial-Territorial Governments

(Per cent of GDP)



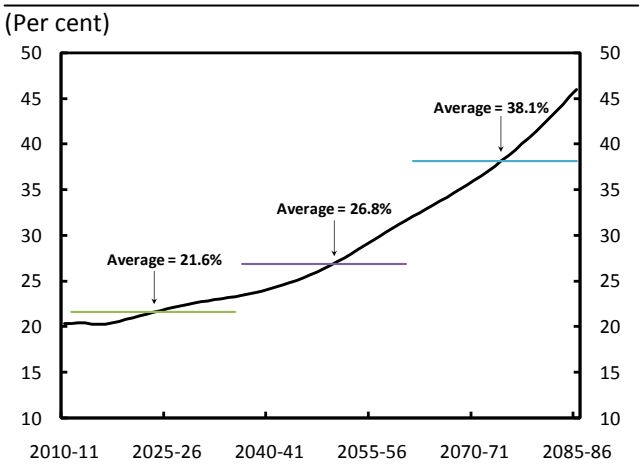
Source: Office of the Parliamentary Budget Officer.
Note: 'Other' federal transfers are presented net of Alternative Payments for Standing Programs (APSP).

Beyond the 2013-14 expiry date of the current legislation, PBO assumes that the CHT and CST continue to increase annually at their current legislated escalators of 6 and 3 per cent respectively. There is, however, considerable uncertainty surrounding growth in these transfers over the 70-year period following the expiry of the current legislation. PBO's assumption that the current escalators are maintained indefinitely helps to illustrate and quantify how the current structure of intergovernmental transfers may influence the *allocation* of adjustments across orders of government that are required to achieve fiscal sustainability. Moreover, the assumption that the current escalators for federal CHT and CST are maintained indefinitely has significant implications with respect to the magnitude of these transfers relative to projected provincial-territorial spending on health, education and social benefits.

To illustrate, PBO's projected growth in provincial-territorial health spending is somewhat lower than the assumed 6 per cent annual growth in the CHT that is maintained over the entire projection horizon. As a result, the share of federal CHT payments in provincial-territorial health spending is projected to increase substantially, albeit at a gradual pace (Figure 3-7). Federal CHT is projected to average 21.6 per cent of provincial-territorial health spending over the first 25 years of the projection horizon, then 26.8 per cent over the next 25 years and 38.1 per cent over the remaining 25-year period, as projected growth in provincial-territorial health spending continues its downward trend.

Figure 3-7

Federal CHT Relative to Provincial-Territorial Health Spending

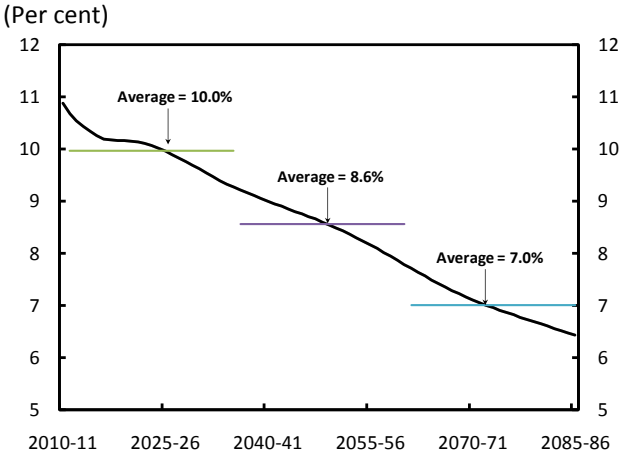


Source: Office of the Parliamentary Budget Officer.

PBO's projected growth in provincial-territorial spending on education and social benefits is somewhat higher than the assumed 3 per cent annual growth in the CST that is maintained over the entire projection horizon.[18] As a result, the ratio of federal CST payments to provincial-territorial spending is projected to decrease steadily over the long term (Figure 3-8). Federal CST is projected to average 10 per cent of provincial-territorial education and social spending over the first 25 years of the projection horizon, then 8.6 per cent over the next 25 years and 7 per cent over the remaining 25-year period, as projected growth in provincial-territorial education and social spending outpaces the 3 per cent growth in annual CST payments.

Figure 3-8

Federal CST Relative to Provincial-Territorial Education and Social Benefits Spending



Source: Office of the Parliamentary Budget Officer.

Consolidated Federal and Provincial-Territorial Program Spending

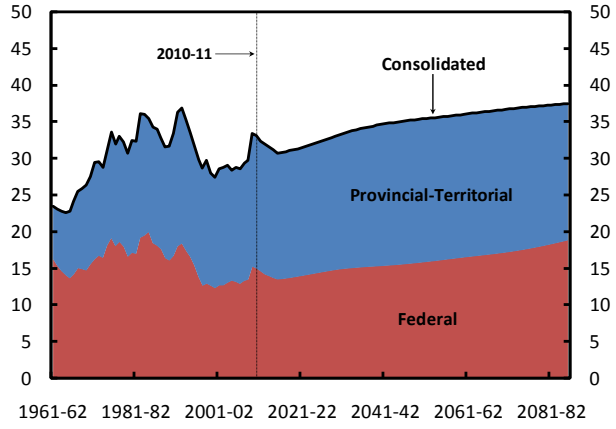
On a consolidated basis, as the economy recovers, federal and provincial-territorial program spending relative to nominal GDP is projected to decline sharply from 33.1 per cent of GDP in 2010-11 to 30.7 per cent of GDP in 2015-16 (Figure 3-9). Over the long term, program spending relative to the size of the economy is projected to rise steadily, ultimately reaching 37.5 per cent of GDP by the end of the projection horizon – well above its long-term historical average of 30.2 per cent of GDP (1961-62 to 2010-11).

[18] The CST provides federal funding to provincial-territorial governments to support post-secondary education, social assistance and social services, and early childhood development and early learning and childcare spending. However, the relatively high-level aggregation of PBO's spending projections do not allow for an exact comparison of the CST and provincial-territorial spending in these areas.

Figure 3-9

Consolidated Federal and Provincial-Territorial Program Spending

(Per cent of GDP)



Source: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: Excludes intergovernmental transfers received by federal and provincial-territorial government sectors.

Over the long term, federal direct program spending is assumed to grow in line with nominal GDP. This assumption, combined with projections of federal transfers to provincial-territorial governments and federal spending on elderly, EI and children's benefits, results in projected program spending that rises to just over 15.7 per cent – its long-term historical average – in 2049-50. Approximately 70 per cent of the increase over this period (amounting to 1.7 percentage points of GDP) is due to rising federal transfers to provincial-territorial governments, while the remainder stems from increases in elderly benefits. Ultimately federal program spending is projected to reach 18.8 per cent of GDP by the end of the projection horizon, which is well above its long-term historical average, but below its historical highs.

The remaining components of provincial-territorial program spending are assumed to grow with nominal GDP over the long term. This assumption, combined with the projections of provincial-territorial government spending on health, education and social benefits (excluding federal transfers) results in projected program spending that rises – due exclusively to growth in health spending that exceeds growth in the economy – from 17.2 per cent of GDP in 2015-16, to 19.6 per cent in 2049-50, remaining close to 20 per cent of GDP until 2070-71. Ultimately provincial-territorial program spending (excluding federal transfers) is projected to decline to 18.6 per cent of GDP by the end of the projection horizon, as the growth in federal transfers further outpaces growth in provincial spending on health, education and social benefits.

Effective Interest Rates on Government Debt

To calculate the borrowing costs for federal and provincial-territorial governments, PBO estimates an effective interest rate defined as the interest on the public debt divided by the previous year's interest-bearing debt. PBO projects the federal effective interest rate on debt to rise gradually over the medium from its historic low of 3.8 per cent in 2010-11 to 4.8 per cent by 2015-16, stabilizing at around 4.9 per cent over the long term, reflecting changes in the composition of federal market and non-market debt over the longer term (see Annex D). This results in a federal effective rate that is consistent with a weighted average of the market interest rates on 3-month treasury bills (4.2 per cent) and 10-year government of Canada bonds (5.3 per cent).

Given the extensive data requirements for projecting the provincial-territorial effective rate on a similar basis, PBO has taken a simple approach that abstracts from provincial-territorial non-market debt. Consistent with the relatively longer maturity structure of provincial-territorial debt, PBO assumes that the provincial-territorial effective rate settles at 50 basis points above the interest rate on the 10-year Government of Canada bond rate (5.3 per cent). This 50-basis point differential is based on the average market interest rate differential between long-term federal and provincial government debt over the period 1993 to 2007.[19] As a result, there is a 90-basis point differential between provincial-territorial and

[19] The long-term federal rate is the average yield on Government of Canada bonds with maturities over 10 years and the long-term provincial rate is Scotia Capital's average weighted yield on long-term provincials.

federal effective interest rates over the long term (i.e., 5.8 versus 4.9 per cent respectively) which is moderately smaller than the average differential of 120 basis points observed over the period 1991-92 to 2007-08.

4 Fiscal Sustainability Assessment

PBO's assessment of whether a government's fiscal structure is sustainable involves projecting its debt-to-GDP ratio over the long term based on assumptions about current program commitments and tax 'burden' given projected demographic and economic trends. Fiscal sustainability requires that government debt cannot ultimately grow faster than the economy. The degree to which this structure is not sustainable can be estimated by the 'fiscal gap' – the difference between the current fiscal structure and a structure that is sustainable over the long term.[20]

The following presents PBO's baseline projection of federal and provincial-territorial government deficit and debt-to-GDP ratios over the long term and their estimated fiscal gaps based on the assumptions that this current fiscal structure, including the system of intergovernmental transfers, is maintained and that the economic backdrop over the long term remains stable (i.e., there are no 'feedback' effects between government finances and the economy).

Further, long-term budget deficit and government debt projections should not be regarded as forecasts or predictions of the most likely economic and fiscal outcomes, rather they should be viewed as 'what-if' scenarios. Indeed, an unsustainable fiscal structure could result in an explosive increase in a government's debt-to-GDP ratio over the long term. Such a scenario would not likely be realized as responses by the government, households, firms and financial markets would bring about changes to this structure and likely at higher costs. Nonetheless, long-term government debt-to-GDP projections serve as a useful signal and a gauge of fiscal sustainability although they are – as is the case with all long-term projections – subject to considerable uncertainty.

[20] The fiscal gap methodology was developed in Blanchard et al. (1990) and Auerbach (1994). The fiscal gap measure is used by organizations such as the CBO, OBR, OECD and IMF, to quantify governments' long-term fiscal imbalances. Annex E provides the detailed definition.

Long-term Debt-to-GDP Projections

Arithmetically, the debt-to-GDP ratio will increase if a government's debt grows faster than GDP. It is informative, however, to distinguish the key drivers underlying government debt-to-GDP accumulation: 1) the operating balance (i.e., revenue less program spending) relative to GDP; and, 2) the differential between the interest rate on debt and nominal GDP growth (see Box 4-1).

Box 4-1: Debt-to-GDP Dynamics

When the effective interest rate on debt (*i*) exceeds GDP growth maintaining a stable debt-to-GDP ratio (*D/Y*) requires running operating balance (*OB*) surpluses. Further, as a share of GDP, the size of the operating surplus necessary to maintain a stable debt ratio depends on the difference between the interest rate and the GDP growth rate as well as the current debt ratio.

$$\frac{OB}{Y} = (i - g) \cdot \frac{D}{Y}$$

This relationship dictates that the debt-to-GDP ratio will increase if the operating balance as a share of GDP is smaller than the interest-growth rate differential multiplied by the current debt ratio.

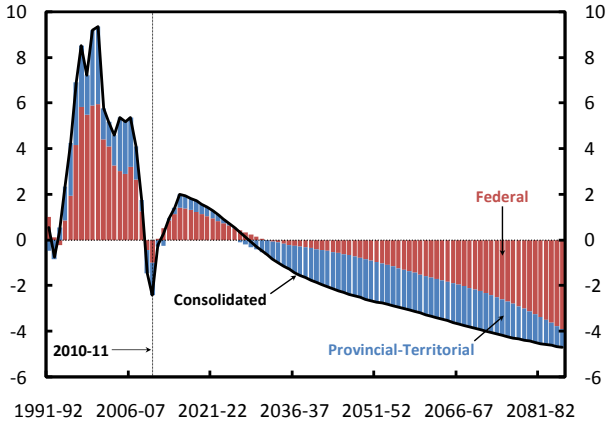
Figures 4-1 to 4-3 show the deficit and debt dynamics resulting from PBO's baseline projection of federal and provincial-territorial revenue and program spending combined with the projected effective interest rates on government debt.

As the economy recovers revenues rebound from their cyclical lows while growth in overall program spending remains constrained. This results in a sharp improvement in the consolidated operating balance relative to GDP (Figure 4-1). However, once the economy has fully recovered and revenue grows in line with nominal GDP, population ageing along with assumed growth in spending – adjusted for inflation and ageing – on health care and elderly benefits are projected to result in sizeable operating deficits over the long term.

Figure 4-1

Consolidated Federal and Provincial-Territorial Operating Balance (Revenue – Program Spending)

(Per cent of GDP)

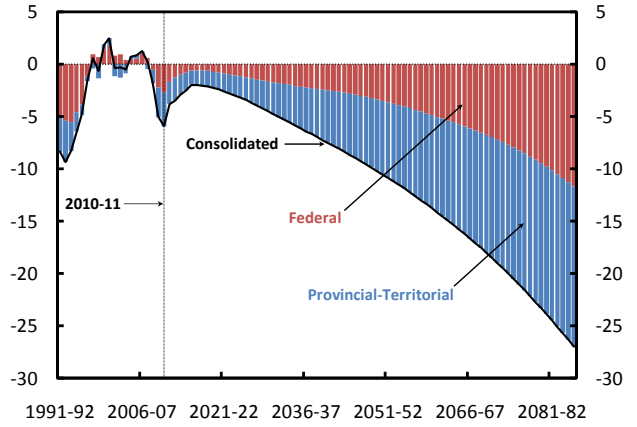


Source: Office of the Parliamentary Budget Officer; Statistics Canada.

Figure 4-2

Consolidated Federal and Provincial-Territorial Government Budget Balance (Net Lending)

(Per cent of GDP)



Source: Office of the Parliamentary Budget Officer; Statistics Canada.

With interest rates on debt exceeding GDP growth, maintaining a stable debt-to-GDP ratio, however, requires running operating *surpluses*. Thus the projected deterioration in the operating balance begins to feed deficit and debt levels, which lead to higher public debt charges that combined with larger and persistent operating deficits causes further increases in budget deficits and debt levels etc., resulting in ever-increasing budget deficit and debt-to-GDP ratios.

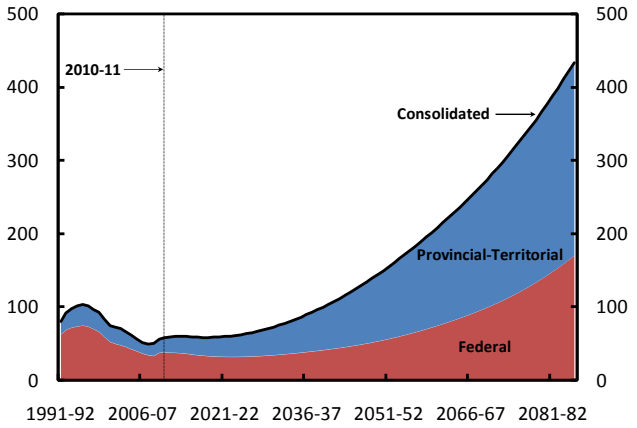
On a consolidated basis, the federal and provincial-territorial budget deficit is projected to improve markedly over the medium term from 5.9 per cent in 2010-11 to 2.0 per cent of GDP in 2015-16, reflecting the rebound in revenues and reductions in program spending relative to nominal GDP (Figure 4-2).[21] However, as growth in program spending begins – and continues – to outpace growth in revenues beyond the medium term, this leads to ever-larger budget deficits.

In PBO's baseline projection consolidated federal and provincial-territorial government net debt relative to GDP is projected to rise steadily from 58 per cent in 2010-11 to 149 per cent in 2050-51 and to over 400 per cent by the end of the projection horizon (Figure 4-3).

Figure 4-3

Consolidated Federal and Provincial-Territorial Government Net Debt (Net Financial Liabilities)

(Per cent of GDP)



Source: Office of the Parliamentary Budget Officer; Statistics Canada.

[21] An alternative medium-term scenario is considered in which both federal and provincial-territorial governments achieve balanced budgets by 2015-16 (Section 5).

Under PBO's baseline projection, as the economy reaches its full capacity, the federal budget deficit (i.e., net borrowing in the CSNA) is projected to improve substantially from 2.7 per cent of GDP in 2010-11 to 0.6 per cent of GDP in 2015-16. However, this improvement is not sustained over the longer term as population ageing reduces growth in revenues and boosts growth in spending on elderly benefits. In addition, maintaining the 6 per cent CHT escalator as revenue growth slows to below 4 per cent compounds the ageing-related pressures. The federal budget deficit is projected to deteriorate to about 12 per cent of GDP in the final year of the projection period, reflecting the unstable dynamic between debt and debt charges.

The deterioration in the federal budget deficit through 2022-23 is however very modest and as a result the federal net debt-to-GDP ratio continues to decline to 31 per cent of GDP. Although beyond this point, further deterioration in the budget deficit drives the federal net debt-to-GDP ratio higher to 54 per cent in 2050-51 and ultimately to approximately 170 per cent of GDP by the end of the projection period.

The provincial-territorial budget deficit, at 1.4 per cent of GDP in 2015-16, is projected to deteriorate to over 15 per cent of GDP by the end of the projection horizon despite CHT growing faster than health spending. The projected deterioration of 14 percentage points of GDP in the provincial-territorial deficit is moderately larger than the 11-percentage point decline projected at the federal level over the same period. As a result of the projected deterioration in the deficit, the provincial-territorial government net debt-to-GDP ratio climbs from 24 per cent in 2015-16 to a projected 95 per cent of GDP in 2050-51 and reaches close to 265 per cent of GDP by 2085-86.

PBO's baseline consolidated federal and provincial-territorial government debt-to-GDP projection indicates that the current fiscal structure is not sustainable over the long term given projected demographic and economic trends. Both federal and provincial-territorial government net debt, over the long term, is projected to ultimately grow faster than the economy, resulting in ever-increasing debt-to-GDP ratios. Further, PBO's projections understate the deterioration in federal and provincial-territorial government finances because they do not incorporate the various channels through which debt-to-GDP accumulation can impact the economy. Permanent increases in government debt relative to the size of the economy can ultimately lower GDP and/or lead to higher interest rates (see Box 2-3) which, if incorporated, would simply accelerate the projected increases in debt-to-GDP ratios.

Fiscal Gap Estimates

The fiscal gap conveys – in a single number – the magnitude of the fiscal action necessary to avoid unsustainable increases in a government's debt-to-GDP ratio. It helps to shift the focus beyond assessing the budget balance or the debt-to-GDP ratio in a given year by explicitly taking into account future revenue and spending pressures. It can be calculated under a variety of assumptions and over different time horizons. However, the fiscal gap cannot determine *which* actions should be taken to achieve fiscal sustainability over the long term or what a government's debt-to-GDP ratio should be in the long term. Such issues are beyond the scope of this report and need to be addressed in a richer framework that captures the costs and benefits of taxes, government spending and debt.

In this report, the fiscal gap is measured as the immediate and permanent increase in a government's operating balance (i.e., revenue less program spending) relative to GDP that is required to achieve the level of the current debt-to-GDP ratio over the long term. The required increase in the operating balance can be achieved by increasing revenue, reducing program spending or some combination of both, from their projected paths over the long term. Since the projections of revenue and program spending span long time horizons, it is necessary to measure them in present-value terms. Indeed, CBO (2009) notes that the fiscal gap "is the present-value measure of the nation's fiscal imbalance". The extent to which

a government's current fiscal structure is not sustainable depends on the size of the operating balance-to-GDP ratio *relative* to the interest rate-GDP growth rate differential multiplied by the current debt-to-GDP ratio (see Box 4-1).

Table 4-1 presents PBO's estimate of the baseline fiscal gaps calculated over 25, 50 and 75-year horizons. The current consolidated federal and provincial-territorial government net debt-to-GDP ratio is 57.9 per cent in 2010-11: 37.6 and 20.3 per cent, respectively, for the federal[22] and provincial-territorial government sectors. The fiscal gap estimates are based on the assumption that fiscal actions required to achieve sustainability would be implemented immediately (i.e., starting in 2011-12) and maintained indefinitely. For each projection horizon (i.e., 25, 50 and 75 years), implementing these fiscal actions would ensure that their net debt-to-GDP ratios return to their respective 2010-11 levels at the end of each horizon.

Table 4-1

Fiscal Gap Estimates

(Per cent of GDP)

	Projection Horizon		
	25 years	50 years	75 years
Consolidated	0.9	2.0	2.7
Federal	0.0	0.6	1.2
Provincial-Territorial	0.9	1.4	1.5

Source: Office of the Parliamentary Budget Officer.
Note: The projection period starts in 2011-12. Calculations are based on the endpoint consolidated net debt-to-GDP ratio of 57.9 per cent (37.6 per cent federal and 20.3 per cent provincial-territorial).

Although fiscal gap estimates are calculated and presented for 25, 50 and 75-year projection horizons – following CBO (2011)[23] – PBO believes that given the lengthy time horizon over which the demographic transition is occurring, it is more appropriate to focus on the 75-year fiscal gap to determine the amount of fiscal action necessary to achieve fiscal sustainability.[24] Further, while the 75-year projection horizon does cover a long period of time, it is the same time horizon over which the Chief Actuary projects incomes, expenditures and assets in the Actuarial Reports of the Canada Pension Plan.[25]

On a consolidated basis, the baseline federal and provincial-territorial government fiscal gap is estimated at 2.7 per cent of GDP when calculated over a 75-year horizon. This means that beginning in 2011-12, the federal and provincial-territorial government operating balance (relative to GDP) would need to increase by about 2.7 percentage points of GDP above its baseline level, by increasing revenue, reducing program spending or some combination of both from their projected baseline to achieve a consolidated net debt-to-GDP ratio of 57.9 per cent after 75 years (Figure 4-4).

[22] The June 2011 federal budget did not provide an estimate of the government's net debt in 2010-11. However, the Department of Finance Canada's March 2011 *Fiscal Monitor* estimated the government's net debt, on a Public Accounts basis, at $616.5 billion or 37.9 per cent of GDP.

[23] OBR (2011) calculates its fiscal gap estimates based on a 50-year projection horizon.

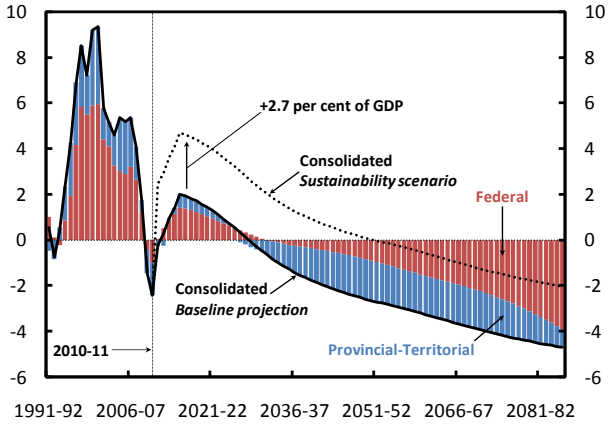
[24] For example, beyond the 25-year horizon, the old age dependency ratio is projected to increase by over 5 percentage points from 38.8 per cent to 44.1 per cent over the remaining 50 years. Therefore additional measures would still be required to achieve fiscal sustainability over the subsequent horizon, notwithstanding the fact that the projected levels of revenue and program spending over the very the long term are discounted heavily in the fiscal gap calculation.

[25] For example, see http://www.osfi-bsif.gc.ca/app/DocRepository/1/eng/oca/reports/CPP/CPP25_e.pdf.

Figure 4-4

Increase in the Baseline Consolidated Operating Balance Required to Achieve Fiscal Sustainability

(Per cent of GDP)



Source: Office of the Parliamentary Budget Officer; Statistics Canada.

Under the baseline projection, the federal fiscal gap is estimated at 1.2 per cent of GDP when calculated over a 75-year horizon, capturing the impact of population ageing and partial indexation on elderly benefits and growth in the CHT above revenue growth.[26] This means that beginning in 2011-12, the federal operating balance would need to improve by almost 1.2 percentage points of GDP annually above its baseline level, by increasing revenue, reducing program spending or some combination of both, to achieve a net debt-to-GDP ratio of 37.6 per cent after 75 years.[27]

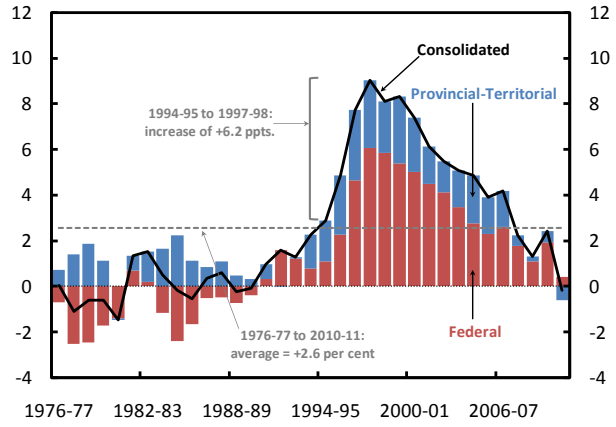
Under the baseline projection, the provincial-territorial fiscal gap is estimated at 1.5 per cent of GDP when calculated over a 75-year horizon, indicating that beginning in 2011-12, the provincial-territorial operating balance would need to improve by 1.5 percentage points of GDP annually above its baseline level, by increasing revenue, reducing program spending or some combination of both, to achieve a net debt-to-GDP ratio of 20.3 per cent after 75 years.[28]

To put the amount of fiscal action required to achieve fiscal sustainability into context, it is helpful to compare the fiscal gap to historical movements in the structural operating balance. The structural balance is considered in order to control for fluctuations arising from economic cycles. Figure 4-5 shows that the consolidated structural operating balance as a share of potential nominal income increased by 6.2 percentage points from 1994-95 to 1997-98. This amount of fiscal action is well in excess of the estimated fiscal gap under the baseline projection; however, these actions were not permanent and were subsequently reversed over the decade that followed. That said, the required 2.7-percentage point improvement in the operating balance under the baseline projection would result in a projected operating *surplus* averaging 0.7 per cent of GDP over the long term, which is well below the historical average of 2.6 per cent.

Figure 4-5

Structural Consolidated Federal and Provincial-Territorial Operating Balance, 1976-77 to 2010-11

(Per cent of potential nominal income)



Source: Office of the Parliamentary Budget Officer.

[26] PBO (2010b) estimated a baseline federal fiscal gap of 1.0 per cent of GDP. The increase in the current baseline gap to 1.2 per cent reflects the change in assumed CHT growth (from growing in line with provincial-territorial health spending in PBO (2010b) to growing at 6 per cent annually in the current baseline). However, the impact of this change has been tempered by changes to demographic and economic projections, as well as to the medium-term fiscal outlook.

[27] Implementing these fiscal actions would result in budgetary surpluses to 2055-56, averaging 0.5 per cent of GDP (peaking at 0.9 per cent in 2018-19) followed by deficits thereafter, averaging 1.7 per cent.

[28] Implementing these fiscal actions would result in budgetary surpluses to 2035-36, averaging 0.4 per cent of GDP (peaking at 0.7 per cent in 2022-23) followed by deficits thereafter, averaging 0.8 per cent of GDP.

5 Sensitivity Analysis

To assess the sensitivity of PBO's baseline fiscal gap estimates, alternative fiscal, demographic and economic assumptions and projections are considered. This section presents PBO's fiscal gap results for the following scenarios:

a) alternative debt-to-GDP ratio endpoints;
b) alternative implementation dates;
c) achieving medium-term budget balance;
d) alternative enrichment growth in elderly benefits and health spending;
e) alternative CHT and CST escalators;
f) alternative demographic projections; and,
g) alternative economic projections.

While this section focuses on the fiscal gap results based on the 75-year horizon, complete projections and fiscal gap estimates based on the 25 and 50-year horizons for each alternative scenario are produced and are available upon request. In all scenarios, unless otherwise noted, all remaining projections are maintained at their baseline levels.

a) Alternative Debt-to-GDP Endpoints

Although the fiscal gap is typically calculated using the current debt-to-GDP ratio as the endpoint over the long term, it can also be calculated for any given debt-to-GDP value. Table 5-1 presents the fiscal gap calculations under the consolidated baseline projection for net debt-to-GDP ratios increasing in 25-percentage point increments from 0 to 100 per cent of GDP under the assumption that current federal and provincial-territorial shares of net debt – 65 and 35 per cent respectively – are maintained at the endpoint. The 'benchmark' estimates, calculated based on the current consolidated net debt-to-GDP ratio (57.9 per cent in 2010-11), are shaded.

Table 5-1

Fiscal Gap Estimates under Different Debt-to-GDP Endpoint Values

(Per cent of GDP)

	Net debt-to-GDP endpoint					
	0	25	50	57.9	75	100
Consolidated	3.1	2.9	2.7	2.7	2.5	2.3
Federal	1.5	1.4	1.2	1.2	1.1	0.9
Provincial-Territorial	1.6	1.6	1.5	1.5	1.5	1.4

Source: Office of the Parliamentary Budget Officer.

Table 5-1 shows that all else equal, an increase (decrease) in the debt-to-GDP endpoint reduces (increases) the fiscal gap as a smaller (larger) operating balance is required to achieve a higher (lower) debt ratio endpoint. On a consolidated basis, the fiscal gap ranges from 2.3 to 3.1 per cent of GDP as the endpoint net debt-to-GDP ratio is reduced from 100 per cent to 0 per cent. The 0.6-percentage point range of the federal fiscal gap (from 0.9 to 1.5 per cent of GDP) is considerably wider than the provincial-territorial fiscal gap (from 1.4 to 1.6 per cent of GDP). This reflects the higher effective interest rate at the provincial-territorial level which discounts the endpoint debt ratio to a greater extent, as well as the narrower range of debt ratios considered. That is, as the consolidated endpoint debt ratio is increased from 0 to 100 per cent of GDP, the federal (provincial-territorial) debt ratio increases from 0 to 65 (0 to 35) per cent.

b) Alternative Implementation Dates

Fiscal gaps are also typically calculated based on the assumption that fiscal measures required to achieve sustainability would be implemented immediately; however, estimates can also be calculated under alternative assumptions about the speed at which the required measures are implemented. Table 5-2 presents fiscal gap estimates under various assumptions about the implementation date while maintaining the consolidated endpoint debt-to-GDP ratio of 57.9 per cent (37.6 per cent at the federal level and 20.3 per cent at the provincial-territorial level) in 2085-

86. The benchmark fiscal gap estimates where measures are implemented immediately (i.e., in 2011-12) with an endpoint debt-to-GDP ratio of 57.9 per cent in 2085-86 are shaded.

Table 5-2

Fiscal Gap Estimates under Various Implementation Dates

(Per cent of GDP)

	Implementation Date				
	2011-12	2016-17	2021-22	2031-32	2041-42
Consolidated					
2085-86 endpoint	2.7	3.0	3.4	4.4	5.8
Federal					
2085-86 endpoint	1.2	1.3	1.4	1.8	2.3
Provincial-Territorial					
2085-86 endpoint	1.5	1.7	2.0	2.6	3.5

Source: Office of the Parliamentary Budget Officer.

Delaying implementing the measures required to achieve fiscal sustainability by five years i.e., in 2016-17 when the economy (based on PBO's estimate) has reached its potential GDP, raises the consolidated fiscal gap modestly under the baseline projection to 3.0 per cent of GDP. Implementing measures in 2016-17 increases the federal fiscal gap marginally from 1.2 to 1.3 per cent of GDP and the provincial-territorial fiscal gap rises slightly from 1.5 to 1.7 per cent of GDP.

The fiscal gaps are also calculated in 10-year increments of delay with a maximum delay of 30 years considered. Delays of this magnitude demonstrate that the amount of fiscal action required to return the consolidated debt-to-GDP ratio back to its 2010-11 level increases disproportionately as the implementation horizon extends over decades. Moreover, the impact (in percentage terms) of delaying implementation of fiscal measures required to achieve sustainability is larger for the provincial-territorial government sector.

c) Achieving Medium-term Budget Balance

Although recent federal and provincial-territorial budgets have committed governments to eliminating their budgetary deficits over the medium term, PBO projects that federal and provincial-territorial deficits will persist. Therefore, to examine the sensitivity of fiscal gap estimates to the medium-term fiscal outlook, PBO considers a scenario in which both federal and provincial-territorial government sectors balance their respective budgets by 2015-16. As an illustration, it is assumed that this is achieved through reductions in 'direct' expenses while all other spending remains at its baseline levels. Further, it is assumed that once budget balance is achieved in 2015-16, direct expenses then grow in line with the economy (i.e., the reductions in direct expenses relative to GDP over the medium term are maintained indefinitely).

At the federal level, on a GFS basis, PBO defines direct expenses as total program spending less: transfers to provincial-territorial governments; spending on elderly benefits; EI; and, children's benefits. At the provincial-territorial level, direct expenses are defined as total program spending less: health and education spending; spending on social benefits and capital formation. In 2010-11, and based on GFS and CIHI data, this estimate indicates that federal and provincial-territorial government direct expenses amounted to 43 and 32 per cent of their respective total program spending levels.

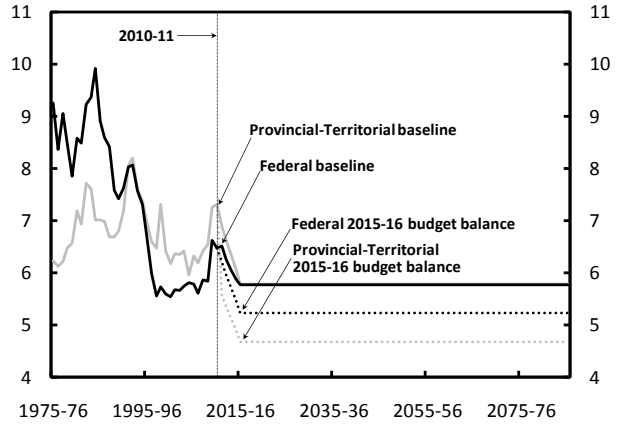
In the baseline projection, federal and provincial-territorial direct expenses relative to GDP are assumed to remain at their respective 2015-16 levels over the projection horizon, which for both sectors – coincidently – is 5.8 per cent (Figure 5-1). Under this alternative scenario, to achieve budget balance in 2015-16 federal and provincial-territorial direct expenses need to be reduced by 0.5 and 1.1 percentage points of GDP respectively,

relative to the baseline projection in 2015-16.[29] Such a permanent reduction would put both federal and provincial-territorial direct spending, relative to the size of the economy, at historic lows.

Figure 5-1

Federal and Provincial-Territorial Direct Expenses

(Per cent of GDP)



Source: Office of the Parliamentary Budget Officer; Statistics Canada.

Assuming both federal and provincial-territorial governments achieve budget balance in 2015-16, and maintain direct expenses at historically low levels relative to the size of the economy, the consolidated fiscal gap is reduced significantly to 1 per cent of GDP, a reduction which is roughly equivalent to the permanent 1.6-percentage point reduction in federal and provincial-territorial direct expenses relative to GDP (Table 5-3). Despite achieving budget balance in the medium term, the fiscal structure over the long term remains unsustainable, albeit to a lesser degree. The reduction in the federal fiscal gap is smaller (in percentage points) compared to the provincial-territorial level, reflecting the larger fiscal actions relative to the baseline projection (1.1 versus 0.5 percentage points of GDP).

Table 5-3

Fiscal Gap Estimates assuming Balanced Federal and Provincial-Territorial Budgets in 2015-16

(Per cent of GDP)

	Budget balance in 2015-16	*Baseline*
Consolidated	1.0	*2.7*
Federal	0.7	*1.2*
Provincial-Territorial	0.4	*1.5*

Source: Office of the Parliamentary Budget Officer.

d) Alternative Enrichment Growth in Elderly Benefits and Health Spending

To illustrate the sensitivity of the baseline fiscal gap estimates to projections of federal elderly benefits and provincial-territorial health spending, PBO considers alternative assumptions for long-term enrichment.

In the case of federal elderly benefits, the baseline assumption is that benefits are partially indexed (at 50 per cent) to real GDP per capita growth. Alternative scenarios based on zero indexation and 'full' (i.e., 100 per cent) indexation to real per capita GDP growth are examined. Under the zero (full) indexation assumption, federal elderly benefits are projected to fall (rise) to 1.8 (3.8) per cent of GDP by the end of the projection horizon, compared to 2.6 per cent of GDP in the baseline.

For provincial-territorial health spending the baseline enrichment assumption is based on the 1976-2010 historical average of 0.4 per cent. Alternative assumptions of zero and 1.7 per cent (the 2001-2010 average) health spending enrichment are considered. To help put the health enrichment scenarios in context, Table 5-4 presents a growth decomposition of provincial-territorial government health spending for the period 1976 to 2010, based on data from CIHI.

[29] At the federal (provincial-territorial) level this would result in direct spending declining by 0.6 (4.2) per cent annually from 2011-12 to 2015-16.

Table 5-4

Components of Provincial-Territorial Government Health Expenditures, 1976-2010

(Per cent annual growth)

	Total	Age	Income (GDP)	Enrichment
1976-2010	7.9	0.8	6.6	0.4
1981-1990	10.4	0.8	8.0	1.4
1991-2000	4.1	0.6	4.7	-1.1
2001-2010	7.0	1.0	4.2	1.7

Source: Office of the Parliamentary Budget Officer; Statistics Canada; Canadian Institute for Health Information.

The assumption of zero health enrichment helps to isolate the contribution from population ageing. With zero enrichment, provincial-territorial health spending is projected to increase from 7.8 per cent of GDP in 2010-11 to 10.7 per cent of GDP in 2050-51 (2 percentage points lower than the baseline) and 11.0 per cent in 2085-86 (4.2 percentage points lower than the baseline). Under the scenario assuming enrichment growth of 1.7 per cent – the average over the past 10 years – provincial-territorial health spending is projected to increase from 7.8 per cent of GDP in 2010-11 to 20.7 per cent of GDP in 2050-51 (8 percentage points higher than the baseline) and 38.5 per cent in 2085-86 (23.3 percentage points higher than the baseline).

At the consolidated level, lower (higher) enrichment assumptions for elderly benefits and health spending reduce (increase) the fiscal gap to 0.9 (9.4) per cent of GDP (Table 5-5).[30] With zero (full) indexation to real GDP per capita growth for elderly benefits, the federal fiscal gap is reduced (raised) to 0.8 (1.6) per cent. Under the assumption that federal CHT continues to grow at 6 per cent annually and with zero health enrichment maintained over the long-term – resulting in 4.4 per cent average annual growth in health spending – the provincial-territorial fiscal gap is almost eliminated, falling to 0.1 per cent of GDP. Assuming health enrichment growth of 1.7 per cent annually over the long term results in a provincial-territorial fiscal gap of 7.8 per cent of GDP, which means that maintaining the recent enrichment growth in health spending is clearly not sustainable over the long term under the current fiscal structure.

Table 5-5

Fiscal Gap Estimates assuming Alternative Enrichment Growth Rates

(Per cent of GDP)

	Lower enrichment	Higher enrichment	*Baseline*
Consolidated	0.9	9.4	*2.7*
Federal	0.8	1.6	*1.2*
Provincial-Territorial	0.1	7.8	*1.5*

Source: Office of the Parliamentary Budget Officer.

e) Alternative CHT and CST Escalators

As discussed in Section 2, this report assumes that, in the baseline projection, the current escalators for federal CHT and CST (6 and 3 per cent respectively) are maintained indefinitely. However, it is also informative to consider alternative scenarios to illustrate and quantify how changes to this structure influence the *allocation* of adjustments across orders of government that are required to achieve fiscal sustainability. With the exception of the impact of different federal and provincial-territorial effective interest rates, the *consolidated* fiscal gap would be unchanged from its baseline estimate for any change to the structure of intergovernmental transfers.[31]

PBO considers a scenario in which both CHT and CST grow in line with nominal GDP beyond 2015-

[30] Under these scenarios, the federal (provincial-territorial) gap is not affected by the alternative enrichment assumptions for health spending (elderly benefits).

[31] While the consolidated operating balance is unchanged from the baseline, the increase in the federal balance (as spending is reduced relative to the baseline), is more than offset – in present-value terms – by the reduction in the provincial-territorial balance. As a result, the consolidated fiscal gap in Table 5-6 is slightly smaller under scenarios in which federal CHT and CST are assumed to grow below their current legislated escalators of 6 and 3 per cent respectively.

16, which maintains these transfers relative to the size of the economy, amounting to 2.3 per cent of GDP over the long-term projection horizon – significantly lower than the 7.4 per cent in 2085-86 under the baseline projection. PBO also considers a scenario in which the size of federal CHT and CST relative to provincial-territorial health and social spending, respectively, is maintained beyond 2015-16. This results in federal CHT and CST rising to 3.7 per cent of GDP in 2085-86 – half of the projected baseline level of 7.4 per cent.

The alternative escalators considered result in federal CHT and CST transfers that, combined, are lower than projected in the baseline (Table 5-6). While the alternative CST escalators (nominal GDP growth and provincial-territorial spending on social benefits) result in increased federal transfers relative to the baseline (3 per cent growth), this is not sufficient to offset reductions in CHT transfers under the alternative escalators. As a result, although the consolidated fiscal gap is little changed relative to the baseline estimate, the alternative escalators lower the federal fiscal gap and increase the provincial-territorial fiscal gap. Indeed, with nominal GDP as the escalator for both CHT and CST transfers, the federal fiscal gap is negative, indicating that the federal government could reduce taxes and or increase program spending by 0.3 per cent of GDP and achieve a net debt-to-GDP ratio of 37.6 per cent in 2085-86.

Table 5-6

Fiscal Gap Estimates under Alternative CHT and CST Escalators

(Per cent of GDP)

	Nominal GDP	P-T spending	*Baseline*
Consolidated	2.5	2.5	*2.7*
Federal	-0.3	0.3	*1.2*
Provincial-Territorial	2.8	2.2	*1.5*

Source: Office of the Parliamentary Budget Officer.

f) Alternative Demographic Projections

All population projections are sensitive to the assumptions for the total fertility rate, life expectancy at birth and the immigration rate, each of which is subject to varying degrees of uncertainty. Therefore, to illustrate the impact that altering these assumptions could have on fiscal gap estimates, PBO has chosen to present alternative scenarios which, from an economic and fiscal perspective, span a range of demographic transitions (i.e., 'older' and 'younger' population projections). Beginning in 2017, these alternative population projections use a combination of high and low assumptions (Table 5-7) for the total fertility rate, life expectancy at birth and the immigration rate which would either increase or decrease, to the largest degree possible, the long-run fiscal impact of population ageing.[32]

Table 5-7

Assumptions underlying Alternative Population Projections

(Per cent)

	'Older' population	'Younger' population	*Baseline*
Total fertility rate	1.5	1.9	1.7
Life expectancy at birth (in 2061)			
Males	88.8	85.8	87.4
Females	91.3	88.6	90.0
Immigration rate (per 1,000)	6.1	9.1	7.6

Source: Office of the Parliamentary Budget Officer.

Two key conclusions follow from these alternative assumptions. First, population growth can be expected to fall going forward. Population growth is projected to grow at an average annual rate of 0.8 per cent in PBO's baseline scenario over the 2011 to 2086 period. In the older population scenario this average growth rate declines to 0.4 per cent, but in the younger population scenario averages 1.1 per cent, in line with current rates and well below rates observed since 1921. Second, the shift in the age composition of the Canadian population is inevitable as it is being driven by the current structure of the population and the old age

[32] These assumptions are consistent out to 2061 with the low and high assumptions presented in Statistics Canada (2010).

dependency ratio is projected to rise significantly over the projection horizon in all three scenarios. The old age dependency ratio is projected to rise from 20.0 per cent in 2009 to 43.2 per cent by 2061 compared to 37.2 per cent in the younger population scenario and 50.7 per cent in the older population scenario.

Under the alternative population scenarios it is assumed that the CHT and CST – as proportions of GDP – remain equal to their baseline values. Without this assumption the federal and provincial-territorial fiscal gaps would move in opposite directions under the same population scenario.[33] Further, it is assumed that beginning in 2017, higher (lower) GDP resulting from a younger (older) population projection affects both federal and provincial-territorial revenue and program spending. For example, a younger population will raise nominal GDP – the broadest measure of the tax base – and therefore increase revenue. However, by assumption, spending will also increase given its direct link to GDP and GDP per capita.

At the consolidated level, the older (younger) population scenario increases (reduces) the fiscal gap to 3.3 (2.1) per cent of GDP (Table 5-8). Both federal and provincial-territorial spending on demographically-sensitive categories is impacted – federal elderly benefits are projected to reach 3.4 (3.0) per cent of GDP and provincial-territorial health spending 17.0 (13.8) per cent in the older (younger) population scenario compared to the baseline projection of 3.2 and 15.2 per cent of GDP, respectively.

Table 5-8

Fiscal Gap Estimates under Alternative Demographic Projections

(Per cent of GDP)

	'Older' population	'Younger' population	*Baseline*
Consolidated	3.3	2.1	*2.7*
Federal	1.4	1.0	*1.2*
Provincial-Territorial	1.9	1.1	*1.5*

Source: Office of the Parliamentary Budget Officer.

The alternative population scenarios affect both the projected federal and provincial-territorial operating balances (relative to GDP) as well as their interest-growth rate differentials, reinforcing their impacts on the fiscal gap. That is, the older (younger) population scenario results in a deterioration (improvement) in the projected operating balance ratio, reflecting higher elderly and health spending, and weaker (stronger) GDP growth, which all else equal means that a larger operating balance is required to achieve sustainability. Under the older (younger) population scenario, the federal fiscal gap increases (decreases) to 1.4 (1.0) per cent of GDP; and, the estimate of the provincial-territorial fiscal gap increases (decreases) to 1.9 (1.1).

g) Alternative Economic Projections

PBO considers alternative projections for real GDP growth and effective interest rates. Similar to the alternative population projections, it is assumed that as proportions of GDP, the CHT and CST remain at their baseline values; and, that beginning in 2017, higher (lower) real GDP growth affects both consolidated federal and provincial-territorial revenue and program spending. Further, changes to interest rates (beginning in 2017) are assumed not to impact GDP and therefore revenue and program spending are unaffected.

[33] The older (younger) population scenario results in a reduction (increase) in GDP growth which, for the federal government raises (reduces) the relative 'burden' of CHT and CST spending fixed at its baseline level; and at the same time, this reduces (increases) the relative 'value' of CHT and CST transfers to provincial-territorial revenues (i.e., all relative with respect to the size of the economy). As a result, while the consolidated fiscal gap would be virtually unaffected, the federal and provincial-territorial fiscal gaps would move in opposite directions under the same population scenario.

Alternative Real GDP Growth Projections

By the end of the projection horizon, the 0.5-percentage point reduction (increase) in real GDP growth considered lowers (raises) the projected *level* of real GDP by 34 per cent (51 per cent) compared to the baseline projection.[34]

Lower (higher) real GDP growth contributes to increasing (reducing) the consolidated fiscal gap. The projected consolidated operating balance, as a share of GDP, is only partially impacted as almost all of program spending moves one-for-one with the change in revenues and GDP. However, federal spending on elderly benefits is only partially indexed to GDP and as a result does not decrease or increase to the same extent as the GDP projection. As a share of GDP, this program therefore increases (decreases) when GDP growth is lowered (increased), which results in a deterioration (improvement) in the projected operating balance-to-GDP ratio, leading to a larger (smaller) estimate of the fiscal gap compared to the baseline estimate.

Changes to the real GDP growth projection also affect the effective interest rate-GDP growth rate differential – which helps determine the size of the 'sustainable' operating balance – so that a reduction (increase) in GDP growth means that a larger (smaller) operating balance is required to achieve a given debt-to-GDP ratio. The increase (reduction) in the interest rate-GDP growth differential combined with the deterioration (improvement) in the projected operating balance-to-GDP ratio result, on a consolidated basis, in a larger (smaller) fiscal gap compared to the baseline estimate (Table 5-9).

Table 5-9

Fiscal Gap Estimates under Alternative Real GDP Growth Projections

(Per cent of GDP)	Lower GDP growth	Higher GDP growth	*Baseline*
Consolidated	3.0	2.4	*2.7*
Federal	1.4	0.9	*1.2*
Provincial-Territorial	1.6	1.5	*1.5*

Source: Office of the Parliamentary Budget Officer.

Alternative Effective Interest Rate Projections

50-basis point changes to projected effective interest rates on federal and provincial-territorial debt are considered. Changes to the effective interest rate do not affect the projected operating balance; however, they do affect the calculation of its present value and the interest rate-GDP growth rate differential. At the consolidated level, a 50-basis point reduction (increase) in interest rates results in a smaller (larger) fiscal gap compared to the baseline estimate (Figure 5-10). This ultimately reflects the impact of a lower (higher) interest rate-GDP growth rate differential – a smaller (larger) operating balance is required to achieve the same debt-to-GDP ratio. This impact, however, is tempered by the impact of the lower (higher) interest rate projection on the present-value calculation as long-term deterioration in the consolidated operating balance is discounted to a lesser (greater) extent. Federal and provincial-territorial fiscal gaps are only slightly different from their baseline estimates and the direction of the impact from alternative effective interest rate projections is the same.

[34] The 0.5-percentage point reduction (increase) in projected real GDP growth in these alternative scenarios is assumed to result from an equivalent reduction (increase) in labour productivity growth.

Table 5-10

Fiscal Gap Estimates under Alternative Effective Interest Rate Projections

(Per cent of GDP)

	Lower interest rate	Higher interest rate	*Baseline*
Consolidated	2.6	2.8	*2.7*
Federal	1.1	1.2	*1.2*
Provincial-Territorial	1.5	1.6	*1.5*

Source: Office of the Parliamentary Budget Officer.

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Annex A
Summary of Key Baseline Projection Assumptions and Results

Demographic Assumptions[a]	
Fertility rate	1.7 children per woman of child bearing age
Life expectancy	Until 2061: Statistics Canada (2010b) medium scenario
	After 2061: males 87.4 years; females 90.0 years
Immigration	Until 2061: 7.6 per 1,000 in the population
	After 2061: roughly 400,000 immigrants per year
Population growth (overall)	0.8 average annual growth over the projection
Population growth (ages 65+)	1.6 average annual growth over the projection

Economic Assumptions[b]	
Average annual growth over the projection	*Per cent*
Nominal GDP growth	3.9
CPI and GDP inflation	2.0
Real GDP growth	1.8
Labour force growth	0.6
Labour productivity growth	1.2
Real GDP per capita growth	1.1
Long-term levels over the projection	*Per cent*
Unemployment rate	6.3
3-month treasury bill rate	4.2
10-year treasury bill rate	5.3
Federal effective interest rate on debt	4.9
P-T effective interest rate on debt	5.8

Fiscal Policy Assumptions	
Own-source revenue	Held at 2015-16 shares of nominal GDP:
	Consolidated fed-prov: 32.7 per cent (federal 14.9; P-T 17.8)
Fed-Prov transfers	CHT 6 per cent annual growth; CST 3 per cent annual growth
Federal elderly benefits	Enrichment factor = -0.5
Federal employment Insurance benefits	Enrichment factor = 0.2
Federal children's benefits	Enrichment factor = 0.0
P-T health spending	Enrichment factor = 0.4
P-T education spending	Enrichment factor = 0.0
P-T social spending	Enrichment factor = 0.0
All other program spending categories	Held at 2015-16 shares of nominal GDP:
	Consolidated fed-prov: 11.6 per cent (federal 5.8; P-T 5.8)

Source: Office of the Parliamentary Budget Officer.
Note: [a] These assumptions are consistent with Statistics Canada (2010b) medium scenario until 2061.
[b] Assumes no feedback between interest rates and economic growth.

Annex B
Demographic Projection

Canada, like most industrialized countries, is undergoing a demographic transition that will have profound impacts on the Canadian labour market and economy. The share of Canada's population that is 65 years of age and over will rise dramatically due to the decline in the total fertility rate observed since the late 1950s and increases in life expectancies observed over the last 80 years. This transition will be particularly strong over the next 20 years as the baby boomers, those born between 1946 and 1964, turn 65 years of age and begin making the transition into retirement.

The demographic structure of the Canadian population is one of the key drivers of PBO's long-term economic and fiscal projection. PBO's baseline population projection presented in this section was produced by Statistics Canada's Demography division using assumptions provided by PBO, which are consistent with Statistics Canada (2010b) until 2061. Specifically, PBO's demographic projection is driven by three key assumptions regarding the total fertility rate, life expectancy at birth and the immigration rate.

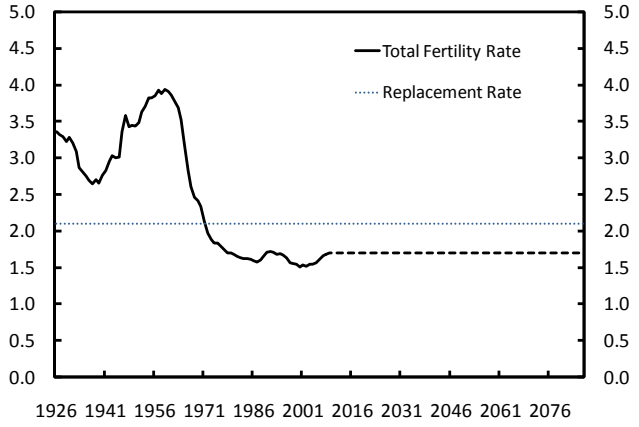
Total Fertility Rate

The total fertility rate, defined as the number of children born per woman of child bearing age, peaked at 3.9 children per woman in 1959 towards the end of the period known as the "baby boom" and has declined significantly since then; remaining well below the replacement rate of 2.1 children per woman since the 1970s (see Figure B-1). Over the projection horizon, PBO has assumed that the fertility rate will remain at 1.7 children per woman of child bearing age, which based on Statistics Canada (2010b) medium scenario and in line with the most recent data for 2008 of 1.68 children per woman of child bearing age.

Figure B-1

Total Fertility Rate, 1926 to 2086

(Children per woman)



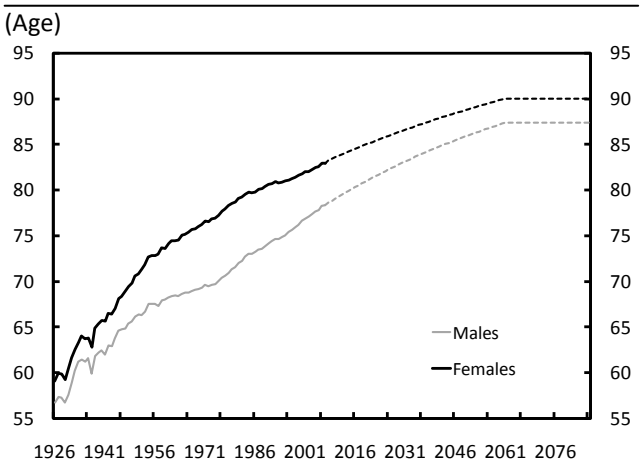
Source: Statistics Canada; Office of the Parliamentary Budget Officer.

Life Expectancy at Birth

Life expectancy at birth has increased significantly over the last 80 years rising from 59.1 years in 1926 to 83.0 years in 2007 for females, an improvement of almost 24 years (Figure B-2). Going forward, PBO has chosen to use assumptions based on Statistics Canada (2010b) medium scenario with life expectancies at birth projected to continue to improve, for both males and females, until 2061 at which point PBO has assumed that they will remain stable until 2086. Specifically, life expectancy at birth for males and females is projected to improve to 87.4 years and 90.0 years respectively.

Figure B-2

Life Expectancy at Birth, 1926 to 2086



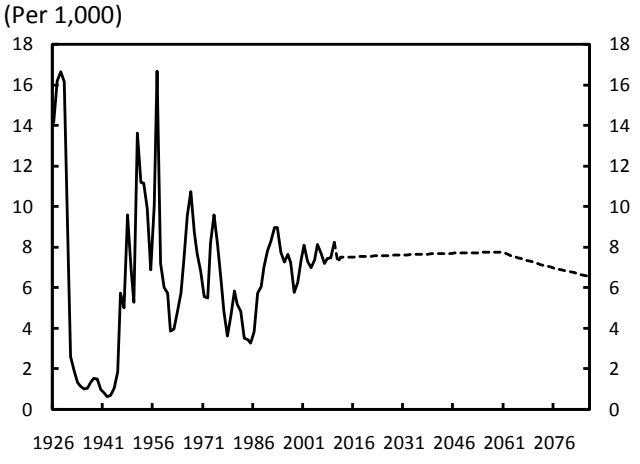
Source: Statistics Canada; Office of the Parliamentary Budget Officer.

Immigration Rate

The immigration rate has fluctuated significantly since 1926 reflecting the different immigration policies that existed at given points in time (Figure B-3). Over the long term, PBO has assumed that the immigration rate will average 7.6 per 1,000 persons from 2011 to 2061 at which point the level of immigration is assumed to remain constant, implying a falling immigration rate beyond 2061.

Figure B-3

Immigration Rate, 1926 to 2086



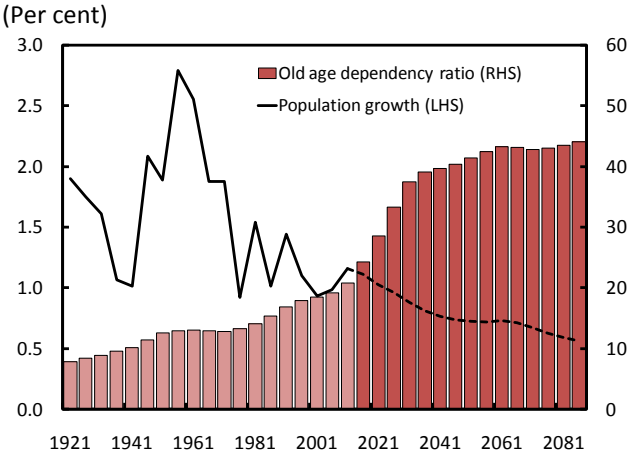
Source: Statistics Canada; Office of the Parliamentary Budget Officer.

The Composition and Size of the Canadian Population

Given the three assumptions discussed above a detailed age and sex projection of the Canadian population has been produced. Figure B-4 shows that population growth is expected to decline steadily throughout the projection horizon and that the old age dependency ratio, defined as individuals 65 years of age and over divided by the population between 15 to 64 years of age, is projected to increase significantly in the coming decades. The dependency ratio is projected to increase by 7.3 percentage points by 2020, which is roughly equivalent to the total increase observed over the last four decades. Moreover, the pace of increase is expected to gain momentum, pushing the dependency ratio to 36.9 per cent by 2030. The pace is then projected to slow after 2030 but the ratio continues to rise, reaching 43.2 per cent by 2061 and 44.1 per cent by 2086. Said differently, in 1971 there were approximately 7.8 persons between the ages of 15 to 64 for every individual 65 years of age and over, the traditional retirement age group. By 2010 the ratio had fallen to 4.9 and is projected to continue falling, reaching 3.6 and 2.7 by 2020 and 2030 respectively before stabilizing at around 2.3 after 2060.

Figure B-4

Population Growth and the Old Age Dependency Ratio, 1921 to 2086



Source: Statistics Canada; Office of the Parliamentary Budget Officer.

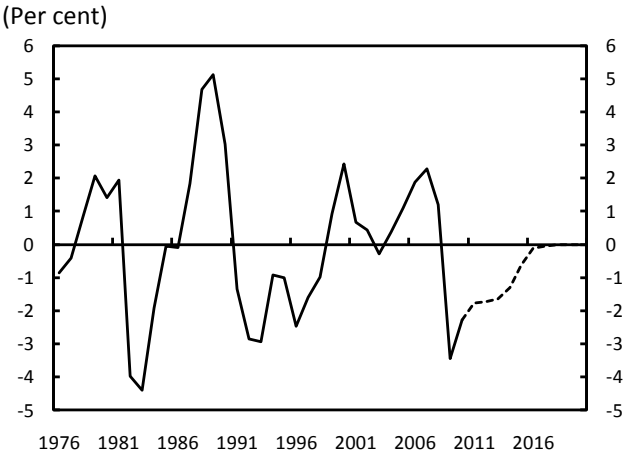
Annex C
Long-term Economic Projection

For the period 2011 to 2016 the economic projection is taken from PBO's June 2011 Economic and Fiscal Outlook and updated to take into account the historical revisions to the Canadian National Accounts released by Statistics Canada at the end of May. The long-term economic projection is then constructed in the same way as the projection presented in PBO's 2010 Fiscal Sustainability Report, with PBO's estimates of potential GDP growth, the size of the working age population, the aggregate employment rate and average weekly hours worked trends having been updated to account for the new population projection and new information.[35]

PBO's medium-term forecast provides a natural starting point for the long-term projection since the output gap (i.e., the level of real GDP relative to potential GDP) is projected to be (essentially) closed by 2016 and therefore beyond the medium term, real GDP should grow, on average, at its potential growth rate (Figure C-1). While it is inevitable that the economy will be subject to both positive and negative shocks going forward, the economy can be expected to return to its potential level following such shocks. As a result, average real GDP growth should equal average potential GDP growth over a long horizon, which is consistent with simply assuming that real GDP will grow at the same rate as potential GDP over the long term.

Figure C-1

Output Gap, 1976 to 2020



Source: Statistics Canada; Office of the Parliamentary Budget Officer.

Real GDP growth

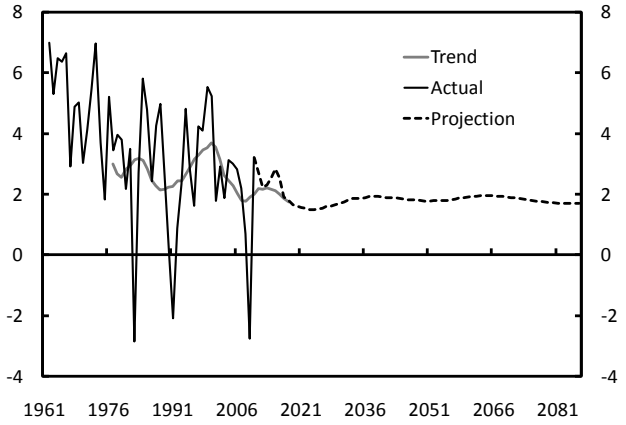
Real GDP is projected to grow, on average, by 2.5 per cent over the 2011 to 2016 period, while potential GDP is projected to rise by 2.1 per cent over the same period (Figure C-2). As a result, the material excess capacity in the Canadian economy that built up following the 2008-09 financial crisis is projected to be gradually absorbed by 2016, after which real GDP is projected to grow in line with PBO's estimate of potential GDP.

[35] For a more detailed discussion of PBO's estimate of potential GDP and how the long-term economic projection is constructed please see PBO (2010b).

Figure C-2

Real GDP Growth, 1962 to 2086

(Per cent)



Source: Statistics Canada; Office of the Parliamentary Budget Officer.

As in PBO's 2010 Fiscal Sustainability Report, population ageing is expected to reduce growth in trend labour supply over the projection horizon due to its negative impact on the aggregate participation and employment rates, as well as due to the slower projected growth in the working age population. PBO's estimate of potential GDP suggests that real GDP growth will average 1.8 per cent over the 2011 to 2086 period relative to the 2.6 per cent growth observed since 1977 (Table C-1).

Table C-1

Contributions to Real GDP Growth

(Percentage points)

	Real GDP	Hours worked	Labour productivity
1962 - 1970	5.3	2.2	3.0
1971 - 1980	4.1	2.3	1.7
1981 - 1990	2.8	1.7	1.1
1991 - 2000	2.9	1.1	1.8
2001 - 2010	1.9	1.0	0.8
2011 - 2020	2.2	1.0	1.2
2021 - 2030	1.6	0.4	1.2
2031 - 2086	1.8	0.6	1.2

Source: Statistics Canada; Office of the Parliamentary Budget Officer.

Other Exogenous Assumptions

Lastly, over the long term PBO uses exogenous assumptions for the following variables: CPI inflation, GDP inflation, the 3-month treasury bill rate, and the 10-year government benchmark bond rate. CPI and GDP inflation are assumed to grow by 2 per cent annually, consistent with the Bank of Canada target. The 3-month treasury bill rate and the 10-year government benchmark bond rate are assumed to be 4.2 and 5.3 per cent respectively. These assumptions are consistent with a real rates return of 2.2 and 3.3 per cent respectively over the projection horizon, which is equal to the average real rates observed over the 1993 to 2007 period.

Annex D
Federal Effective Interest Rate Projection

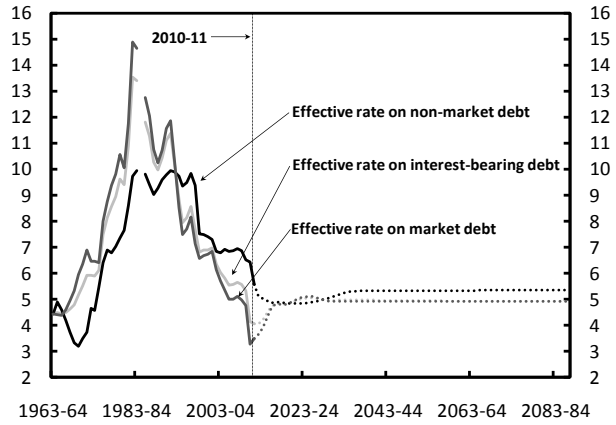
In PBO's 2010 Fiscal Sustainability Report, the effective rate of interest was defined as the ratio of public debt charges to the previous year's federal debt (i.e. the ratio of gross flows to net stocks). In order to improve consistency between the stocks and flows, the effective rate on debt is now defined as the ratio of public debt charges to the previous year's interest-bearing debt (i.e., the ratio of gross flows to gross stocks).

Figure D-1 displays the effective rates on interest bearing debt, market debt and non-market debt. The effective rate on non-market debt has been consistently higher than the effective rate on market debt over the last 20 years resulting from the fact that interest due to public service pension plans – the largest components of non-market debt – is calculated based on the yield of a notional 20-year government bond whereas the effective rate on market debt is a weighted average of yields on Government of Canada securities.

Figure D-1

Federal Effective Interest Rate

(Per cent)



Source: Office of the Parliamentary Budget Officer; Public Accounts of Canada, 2010 Fiscal Reference Tables.

Note: Data from 1983-84 onward are not directly comparable with prior years due to the introduction of full-accrual accounting.

The effective rate on market debt is projected utilizing the weighted average of projected yields on 3-month treasury bills and 10-year bonds.

Non-market debt stocks and debt charges are projected separately. Public sector pension plan debt is the total accrued benefit obligations of all public sector pension plans *minus* market related assets.[36] Similarly, the debt charges associated with public sector pension plans are interest on total accrued pension obligations *minus* interest earned on market assets.

Eventually, total accrued benefit obligations are completely backed by market assets thereby eliminating pension liabilities from interest bearing debt. Similarly, the expected return on market assets completely offsets the interest on accrued benefit obligations thereby eliminating debt charges due to public pensions. As such, the market-debt share of interest-bearing debt increases from 73 per cent in 2009-10 to 99 per cent in 2085-86 making the market debt and interest-bearing debt effective rates in Figure D-1 nearly identical in the long run.

The remaining component of non-market debt is the obligations related to other employee and veteran future benefits. The interest on these liabilities is assumed to be equal to the yield on 10-year government bonds and thus converges to 5.3 per cent in the long run. Although this rate appears to differ substantially from the effective rate on market-debt, the relative size of the stock is miniscule, and thus it has little bearing on the effective rate of interest bearing debt.

A more detailed description of PBO's approach will be provided in a forthcoming analytical note.

[36] Total accrued benefit obligations consists of obligations related to the Public Sector Superannuation Accounts (pre-2000 pensions) and the Public Sector Pension Fund Accounts (post-2000 pensions). After 2000, all net contributions to public sector pension plans are invested in the market by the Public Sector Pension Investment Board.

Annex E
Fiscal Gap Definition

A government's budget balance *BB* is defined as $BB_t = OB_t - i_t \cdot D_{t-1}$, where *OB* is the operating balance (revenues minus program spending) and *i* is the effective rate on government debt *D*. Government debt accumulates according to $D_t = (1+i_t)\cdot D_{t-1} - OB_t$. Solving the debt accumulation equation forward and substituting yields:

$$D_t = \prod_{i=1}^{k}\left(\frac{1}{1+i_{t+i}}\right)\cdot D_{t+k} + \sum_{i=1}^{k}\prod_{j=1}^{i}\left(\frac{1}{1+i_{t+j}}\right)\cdot OB_{t+i}$$

Fiscal sustainability is conventionally defined as satisfying the condition that debt cannot ultimately grow faster than the interest rate. Denoting growth in debt as *x* and evaluating over the infinite horizon implies that if debt does not grow faster than the interest rate over the long term, then

$$\lim_{k\to\infty}\prod_{i=1}^{k}\left(\frac{1}{1+i_{t+i}}\right)\cdot D_{t+k} = \lim_{k\to\infty}\prod_{i=1}^{k}\left(\frac{1+x_{t+i}}{1+i_{t+i}}\right)\cdot D_t = 0;$$

and the relationship holds then the current debt level must equal the present value of future operating balances, which is the starting point for fiscal gap calculations.

$$D_t = \sum_{i=1}^{\infty}\prod_{j=1}^{i}\left(\frac{1}{1+i_{t+j}}\right)\cdot OB_{t+i}$$

Given projected operating balances $\overline{OB}$, the current level of debt is unlikely to equal the present value of operating balances; thus the fiscal gap is the difference between the current debt level and the present value of projected operating balances. The fiscal gap Δ is usually expressed as the immediate and permanent change to the projected operating balance, calculated as a constant proportion of projected GDP ($\overline{Y}$).

$$D_t = \sum_{i=1}^{\infty}\prod_{j=1}^{i}\left(\frac{1}{1+i_{t+j}}\right)\cdot\left(\overline{OB}_{t+i} + \Delta\cdot\overline{Y}_{t+i}\right)$$

$$\Delta = \frac{D_t - \sum_{i=1}^{\infty}\prod_{j=1}^{i}\left(\frac{1}{1+i_{t+j}}\right)\cdot\overline{OB}_{t+i}}{\sum_{i=1}^{\infty}\prod_{j=1}^{i}\left(\frac{1}{1+i_{t+j}}\right)\cdot\overline{Y}_{t+i}}$$

The fiscal gap can also be computed over finite horizons under alternative assumptions about the endpoint debt-to-GDP ratio d^* at some point *k* periods in the future. Typically the current debt-to-GDP ratio is used as the endpoint.

$$D_t = \prod_{i=1}^{k}\left(\frac{1}{1+i_{t+i}}\right)\cdot d^*\cdot\overline{Y}_{t+k} + \sum_{i=1}^{k}\prod_{j=1}^{i}\left(\frac{1}{1+i_{t+j}}\right)\cdot\left(\overline{OB}_{t+i} + \Delta\cdot\overline{Y}_{t+i}\right)$$

$$\Delta = \frac{D_t - \prod_{i=1}^{k}\left(\frac{1}{1+i_{t+i}}\right)\cdot d^*\cdot\overline{Y}_{t+k} - \sum_{i=1}^{k}\prod_{j=1}^{i}\left(\frac{1}{1+i_{t+j}}\right)\cdot\overline{OB}_{t+i}}{\sum_{i=1}^{k}\prod_{j=1}^{i}\left(\frac{1}{1+i_{t+j}}\right)\cdot\overline{Y}_{t+i}}$$