CANADA

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BUDGET

The Fiscal and Distributional Impact of Changes to the Federal Personal Income Tax Regime

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This analysis is based on Statistics Canada's Social Policy Simulation Database and Model. The assumptions and calculations underlying the simulation results were prepared by PBO and the responsibility for the use and interpretation of these data is entirely that of the authors.

This report was prepared by the staff of the Parliamentary Budget Officer. Helen Lao and Carleigh Malanik wrote the report. Scott Cameron contributed to the analysis. Mostafa Askari, Scott Cameron, Duncan MacDonald, Chris Matier and Jason Jacques provided comments. Patricia Brown and Jocelyne Scrim assisted with the preparation of the report for publication. Please contact pbo-dpb@parl.gc.ca for further information.

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Executive Summary

The member for Rimouski-Neigette-Temiscouata-Les Basques, Mr. Guy Caron, requested that the Parliamentary Budget Officer analyze the fiscal and distributional impact of two changes to the federal personal income tax (PIT) regime announced by the government in December 2015:

1. Introducing a 33.0 per cent PIT rate on taxable income over $200,000, effective January 1, 2016.
2. Reducing the PIT rate on the second tax bracket (taxable income of $45,283 to $90,563 in 2016) from 22.0 per cent to 20.5 per cent, effective January 1, 2016.

The member also requested that the change to the second bracket be compared to an alternative:

3. Reducing the PIT rate on the first income tax bracket from 15.0 per cent to 14.0 per cent (up to $45,282 of taxable income in 2016), starting on January 1, 2016.

PBO estimates the *fiscal impact* of the PIT rate changes as federal taxes less federal transfer income. The *net primary impact* is the increase (or decrease) in federal revenues and expenses resulting from tax rate changes applied to the existing tax base.

PBO further estimates a *behavioural response* of taxfilers to the new lower (or higher) marginal tax rates based on assumptions for the elasticity of taxable income [1].

A behavioural response would arise from an individual's decision to work more (or less) or report more (or less) taxable income. The *net primary impact* in combination with the *behavioural response* is equal to the expected *net fiscal impact* on the government's budget balance.

PBO estimates that the net fiscal impact of the first two changes will reduce PIT revenues by $0.4 billion in 2015-16 and about $1.7 billion annually on average from 2016-17 to 2020-21 (Summary Table 1).

That is, the estimated revenue gains from introducing a new tax rate of 33.0 per cent on taxable income over $200,000 falls short of covering the estimated loss in revenues from reducing the PIT rate on the second tax bracket by $8.9 billion from 2015-16 to 2020-21.

Summary Table 1

The new 33% bracket falls short of covering the estimated loss in revenues from reducing the PIT rate on the second tax bracket by $8.9 billion over the next six years.

Fiscal impact of announced PIT changes

$ billions	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	Total
Net Primary Impact	-0.1	-0.3	-0.3	-0.3	-0.3	-0.3	-1.7
Behavioural Response	-0.3	-1.3	-1.3	-1.4	-1.5	-1.5	-7.2
Net Fiscal Impact	-0.4	-1.6	-1.6	-1.7	-1.8	-1.9	-8.9
Of which:							
Second bracket	*-0.8*	*-3.4*	*-3.6*	*-3.7*	*-3.9*	*-4.1*	*-19.4*
Top bracket	*0.4*	*1.8*	*1.9*	*2.0*	*2.1*	*2.2*	*10.5*

Notes: The assumed behavioural response for the 33.0 per cent top bracket change is 0.38 and for the 20.5 per cent second bracket change is 0.10.
Numbers may not add due to rounding.

Reducing the first bracket personal income tax rate from 15.0 to 14.0 per cent would reduce revenue by about $4.1 billion on average annually from 2016-17 to 2020-21.

Summary Table 2

The cumulative cost over six years of reducing the first bracket tax rate by one percentage point is $21.3 billion, slightly higher than the cost of reducing the 22% rate.

Fiscal impact from reducing PIT for first tax bracket

$ billions	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	Total
Primary impact	-0.9	-3.8	-3.9	-4.1	-4.3	-4.5	-21.5
Behavioural response	0.0	0.0	0.0	0.0	0.1	0.1	0.3
Total	**-0.9**	**-3.7**	**-3.9**	**-4.1**	**-4.2**	**-4.4**	**-21.3**

Note: The assumed behavioural response for the 15 per cent bracket is 0.10.

PBO estimates the distributional impact as the average change in total taxes paid (federal and provincial) per taxpayer, and the change in total taxes paid as a share of taxable income. These estimates include the behavioural response.

Summary Figure 1 shows the distribution of gains, across taxable income deciles, as a per cent of total taxable income, from the 1.5 percentage point reduction in the second bracket tax rate, a 1.0 percentage point reduction in the first bracket tax rate, and the introduction of a new tax bracket with the marginal tax rate of 33.0 per cent.

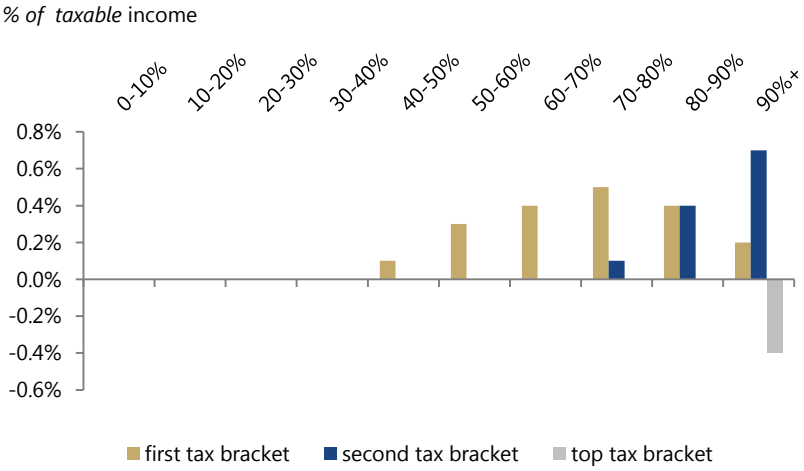
Only a small percentage of those in the top decile have taxable income greater than $200,000 (1.4% of all taxpayers). Introducing the new tax bracket

will increase these individuals' taxes owed by $5,255 in 2016, on average. A change to the first tax bracket will provide tax savings to the top 60 per cent of earners. The reduction of the second bracket tax rate will benefit the top 30 per cent of earners.

Summary Figure 1

Taxpayers with lower incomes benefit more under a reduction to the first bracket tax rate than under a reduction to the second bracket tax rate.

Distribution of tax savings by taxable income deciles



1. Introduction

The member for Rimouski-Neigette-Temiscouata-Les Basques requested that the Parliamentary Budget Officer analyze the fiscal and distributional impact of two changes to the federal personal income tax (PIT) regime announced by the government in December 2015:

1. Introducing a 33.0 per cent (PIT) rate on taxable income over $200,000, effective on January 1, 2016.
2. Reducing the PIT rate on the second tax bracket (taxable income of $45,283 to $90,563 in 2016) from 22.0 per cent to 20.5 per cent, effective on January 1, 2016.

The member also requested that the results be compared to an alternative option:

3. Reducing the PIT rate on the first income tax bracket from 15.0 per cent to 14.0 per cent (up to $45,282 of taxable income in 2016), starting on January 1, 2016.

PBO estimates the *fiscal impact* as federal taxes less federal transfer income. The *net primary impact* is the estimated increase (or decrease) in federal revenues and expenses resulting from tax rate changes applied to the existing tax base.[2]

Increases (or decreases) in marginal tax rates may induce individuals to change their behaviour by choosing to work less (or more) or applying greater (or fewer) tax strategies to lower their reported taxable income. These behavioural changes would alter the size of the tax base and, therefore, the projected government revenues. PBO estimates a *behavioural response* for each of the three changes. The behavioural change is estimated based on assumptions for the elasticity of taxable income (ETI). Adding the *behavioural response* to the *net primary fiscal impact* results in the PBO's estimate of the *net fiscal impact*.

An important caveat is that PBO uses a constant ETI to estimate the behavioural response from a PIT rate change. However, the behavioural response could be higher or lower in the beginning of the estimation horizon as taxpayers could shift their income to (or away from) the tax year before the policy takes effect to minimize tax payments.

2. Primary Fiscal Impact

The Government announced a new 33.0 per cent tax rate for individuals with taxable income over $200,000, which is estimated to affect about 340,000 individuals in 2016. The government also announced the reduction of the second bracket from 22.0 per cent to 20.5 per cent. In 2016, an estimated 7.5 million individuals with taxable income fall within this second tax bracket.[3]

The total net primary fiscal impact of introducing the 33.0 per cent tax rate would be to increase government revenue by an estimated $19.1 billion from 2015-16 to 2020-21. This measure will increase government revenue by an estimated $0.8 billion in 2015-16, and by $3.7 billion on average annually from 2016-17 to 2020-21 (Table 2-1).

The total net primary impact of reducing the PIT rate from 22.0 per cent to 20.5 per cent for the second tax bracket is to reduce government revenue by an estimated $20.8 billion from 2015-16 to 2020-21.

Table 2-1 Primary impact estimates of PIT changes

$ billions	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	Total
Top bracket	0.8	3.3	3.5	3.7	3.8	4.0	19.1
Second bracket	-0.9	-3.6	-3.8	-4.0	-4.2	-4.4	-20.8
First bracket	-0.9	-3.8	-3.9	-4.1	-4.3	-4.5	-21.5

The total primary impact of reducing the existing rate for the first tax bracket from 15.0 per cent to 14.0 per cent would be to lower government revenue by $21.5 billion from 2015-16 to 2020-21. Federal PIT revenues would be $0.9 billion lower in 2015-16, and about $4.1 billion a year lower on average from 2016-17 to to 2020-21.

In 2016, an estimated 17.9 million individuals have taxable income that falls within the first tax bracket.[4]

3. Behavioural Response Impact

PBO has incorporated a behavioural response based on assumptions for the elasticity of taxable income (ETI). The ETI measures the changes in taxable income in response to changes in marginal tax rates.

It is the percentage change in taxable income expected to result from a 1 per cent change in the after-tax value of a marginal dollar of taxable income.[5] The ETI captures two types of behavioural responses that individuals make to adjust their taxable income resulting from a change in their marginal tax rate:

1. **Real economic behaviour**: changes in the marginal tax rate may affect labour supply because of changes in the relative value of consumption and leisure. For example, individuals may increase or decrease their working hours in response to a change in their marginal tax rate.[6]
2. **Efforts to reduce taxable income**: changes in the marginal tax rate may also induce individuals to change their tax strategies to minimize tax payments. For example, individuals may change their preferred form of remuneration and use other tax avoidance mechanisms more aggressively.[7]

PBO assumes an ETI of 0.10 for the first and second brackets of taxable income. PBO assumes an ETI of 0.38 for the new bracket that applies to individuals with taxable income above $200,000 based on analysis from Milligan and Smart (2013).

Appendix B provides a detailed description of PBO's methodology in calculating the behavioural response of the PIT changes.

3.1. Response on taxable income above $200,000

PBO estimates that the behavioural response from individuals with taxable income above $200,000 will reduce government revenue by $0.4 billion in 2015-16, and about $1.7 billion on average annually from 2016-17 to 2020-21 (Table 3-1). Between 2015-16 and 2020-21, the behavioural response would reduce revenue by $8.6 billion.

Combined with the primary impact, the net impact of the measure would be to increase government revenue by $0.4 billion in 2015-16 and $2.0 billion a year on average from 2016-17 to 2020-21. In total from 2015-16 to 2020-21, the net impact would be to increase revenue by $10.5 billion.

Table 3-1

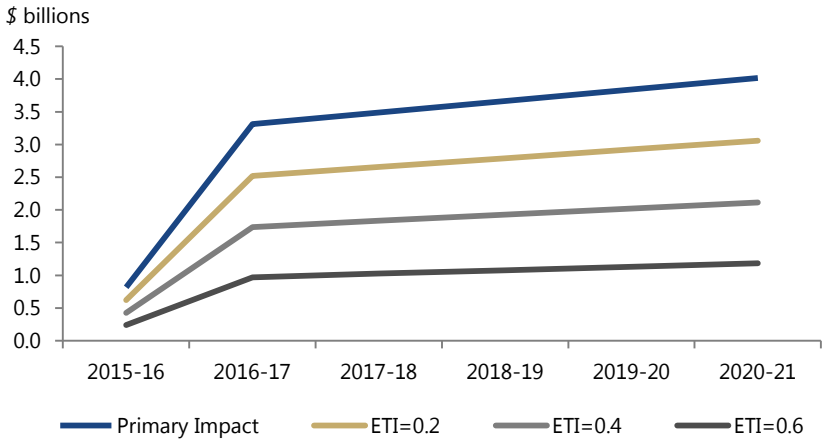
Fiscal impact with behavioural change of new tax rate on taxable income above $200,000

$ billions	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	Total
Net primary impact	0.8	3.3	3.5	3.7	3.8	4.0	19.1
Behavioural response	-0.4	-1.5	-1.6	-1.7	-1.7	-1.8	-8.6
Net Fiscal Impact	0.4	1.8	1.9	2.0	2.1	2.2	10.5

Figure 3-1 illustrates the sensitivity of fiscal impacts arising from varying the ETI. In general, increasing the ETI by 0.1 reduces the federal fiscal impact by about $0.4 billion per year.

Figure 3-1

Sensitivity of fiscal impact of top bracket tax change to a range of behavioural responses



As noted earlier, these estimates of net fiscal impact do not reflect the potential influence of forestalling on the timing of revenue flows. Were forestalling to occur, it is anticipated that the impact would be most pronounced with respect to the new 33% bracket. These taxpayers tend to have a disproportionately greater share of their incomes comprised of investment-related income, which could be subject to greater shifting[8] (Box 3-1).

Box 3-1: Tax Forestalling

Because the tax on incomes greater than $200,000 was announced before the end of the 2015 tax year, taxpayers had time to shift investment income and dividends forward to take advantage of the lower 2015 tax rate. This timing effect is referred to as *forestalling*. As a result of forestalling, the cost of foregone income taxes from efforts to minimize taxable income could be higher in the 2016 tax year and could be lower in subsequent years.

Although there have been few recent federal income tax changes to estimate the likely magnitude of forestalling, we can look to the experience in other jurisdictions as a guide. In the UK, HMRC estimated that when it implemented a new 50 per cent tax rate on incomes over £150,000 (an increase of 10 percentage points) in tax year 2010-11, around 17 per cent of the total income of high earners was brought forward one year to 2009-10. † This resulted in a five percent one-off increase in total PIT revenues prior to the implementation of the new rate, and a corresponding four percent reduction in tax revenues the year afterward (a 90 per cent unwinding of forestalling, with the remaining 10 per cent shifted from subsequent years). HMRC attributed the forestalled income mostly to income from company owner-directors who have flexibility with the timing of their own remuneration, particularly the exercise of share options.

The opportunities for tax planning and the income profiles of high earners in the UK and Canada are different, but if forestalling efforts in the two countries are similar, one could expect a roughly $1.4 billion increase in revenues in the 2015 tax year, with an offsetting reduction in subsequent years, primarily in 2016. Further, because many of the studies on which PBO based our ETI assumptions did not control for one-off forestalling effects in their assessment of past rate changes in Canada and other jurisdictions, the ETIs that PBO assumed could overestimate the medium-term response of taxable income to changes in tax rates.‡

† See U.K. HM Revenue & Customs (2012)
‡ See Saez, Slemrod and Giertz (2012, s 2.2.2) and Saez and Veall (2005, p 846) for a discussion of timing effects in estimation.

3.2. Response of reducing the tax rate for the second tax bracket

PBO estimates that the behavioural response of individuals will increase government revenue by $60 million in 2015-16 and $266 million on average annually from 2016-17 to 2020-21 (Table 3-2). The behavioural response will increase revenue by $1.4 billion over the period of 2015-16 to 2020-21.

Combined with the primary impact, the net fiscal impact of this measure would be to reduce revenue by $0.8 billion in 2015-16 and by roughly $3.7 billion on average each year between 2016-17 and 2020-21.

Cumulatively, between 2015-16 and 2020-21, the measure would decrease government revenue by $19.4 billion.

Table 3-2 Fiscal impact from reducing PIT rate for second tax bracket

$ billions	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	Total
Net primary impact	-0.9	-3.6	-3.8	-4.0	-4.2	-4.4	-20.8
Behavioural response	0.1	0.2	0.3	0.3	0.3	0.3	1.4
Net Fiscal Impact	-0.8	-3.4	-3.6	-3.7	-3.9	-4.1	-19.4

Note: Values in table may not add due to rounding.

3.3. Response of reducing the tax rate for the first tax bracket

PBO estimates that the behavioural response of individuals in the first tax bracket will increase government revenue by $11 million in 2015-16 and by $48 million on average annually from 2016-17 to 2020-21.

The behavioural response from this measure would increase government revenue by an estimated $251 million from 2015-16 to 2020-21 (Table 3-3).

The net fiscal impact of this measure would be to reduce government revenue by $0.9 billion in 2015-16 and by $4.1 billion per year on average from 2016-17 to 2020-21.

Cumulatively, between 2015-16 and 2020-21, this measure would decrease government revenue by $21.3 billion.

Table 3-3 Fiscal impact from reducing PIT for first tax bracket

$ billions	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	Total
Primary impact	-0.9	-3.8	-3.9	-4.1	-4.3	-4.5	-21.5
Behavioural response	0.0	0.0	0.0	0.0	0.1	0.1	0.3
Net Fiscal Impact	-0.9	-3.7	-3.9	-4.1	-4.2	-4.4	-21.3

Note: Values in table may not add due to rounding.

4. Combined Net Fiscal Impacts

Accounting for behavioural impacts, the net fiscal impact of reducing the tax rate on the second bracket from 22.0 per cent to 20.5 per cent and introducing a new 33.0 per cent tax rate for the top bracket would be a net loss in government revenue. Between 2015-16 and 2020-21, the revenue gains from the new tax rate would fall short of covering the loss in revenues from reducing the rate on the second tax bracket by an estimated $8.9 billion.

In 2015-16, the revenue shortfall would be an estimated $0.4 billion. Between 2016-17 and 2020-21, the revenue shortfall would be roughly $1.7 billion a year on average.

Table 4-1 Net impact from second and top bracket changes

$ billions	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	Total
Second bracket	-0.8	-3.4	-3.6	-3.7	-3.9	-4.1	-19.4
Top bracket	0.4	1.8	1.9	2.0	2.1	2.2	10.5
Total	-0.4	-1.6	-1.6	-1.7	-1.8	-1.9	-8.9

The net fiscal impact of reducing the tax rate on the first bracket from 15.0 per cent to 14.0 per cent and introducing a new 33.0 per cent tax rate for the top bracket would result in an estimated revenue shortfall of $10.8 billion from 2015-16 to 2020-21.

In 2015-16, the fiscal impact would be an estimated shortfall of $0.5 billion; between 2016-17 and 2020-21, the estimated shortfall would be about $2.1 billion a year on average (Table 4-2).

Table 4-2 Net impact from first and top bracket changes

$ billions	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	Total
First bracket	-0.9	-3.7	-3.9	-4.1	-4.2	-4.4	-21.3
Top bracket	0.4	1.8	1.9	2.0	2.1	2.2	10.5
Total	-0.5	-1.9	-2.0	-2.0	-2.1	-2.2	-10.8

5. Distributional Analysis

The following distributional analysis presents the change in total taxes paid (federal and provincial), including behavioural impacts, as well as change in total taxes paid as a share of taxable income.[9,10] Measuring the change in total taxes paid reflects the impact Canadian taxpayers will face, whereas the net fiscal impact examined in the previous sections presents the impact to the federal government.

Since income taxes are incremental, making changes to the lowest tax bracket will affect the most individuals. Roughly 83 per cent of taxpayers would see a change in the amount of taxes owed if the bottom tax bracket rate were to drop from 15.0 per cent to 14.0 per cent.[11]

In comparison, the change to the middle income tax bracket rate would affect 43 per cent of taxpayers. The creation of a new high-income tax bracket will directly affect 1.5 per cent of taxpayers.[12]

Typically, individuals whose incomes are equal to or greater than the affected tax bracket will experience a change in the amount of taxes payable. However, some individuals whose incomes fall below the affected tax bracket may also be affected. This is due to the transfer of tax credits and/or income between spouses or eligible persons.

Similarly, some individuals whose incomes fall in the tax bracket being changed may not experience a change in the taxes they pay. This could occur if additional tax credits or pension income are transferred to their higher income spouse, for example, to optimize the family after-tax income.

Box 5-1: Distribution by taxable income deciles

Taxable income deciles are created using nine values of taxable income that divide the population into ten equal groups, so that each decile contains roughly 10% of the population. The table below displays the value at which each decile begins, as calculated for this report. The lowest two deciles – or bottom 20% of earners – have a value of zero because many Canadians have zero taxable income.

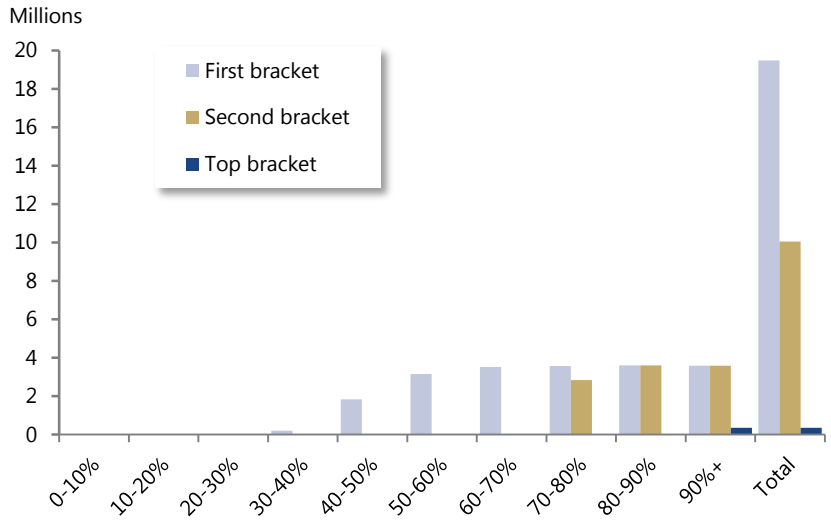
Corresponding taxable income cut-offs for deciles	
10%	$0
20%	$0
30%	$5,919
40%	$13,955
50%	$21,883
60%	$31,924
70%	$42,900
80%	$56,147
90%+	$79,964+

Figure 5-1 shows that the combination of a new tax bracket on income over $200,000 and lowering the first tax bracket rate from 15.0 per cent to 14.0 per cent will affect more taxpayers than the combination of the new tax bracket on income over $200,000 and a reduction in the second tax bracket rate from 22.0 per cent to 20.5 per cent.

Figure 5-1

A tax cut to the first tax bracket would affect the taxes owed of more individuals compared to changes to any other tax bracket.

Individuals with changes in taxes paid by taxable income deciles



Creating a new high-income tax bracket for income over $200,000 taxed at a rate of 33.0 per cent would result in an average increase in total taxes paid, borne almost exclusively by taxpayers in the top decile. The top 10 per cent of earners would pay an additional $501 on average.

However, only a small percentage of those in the top decile have taxable income greater than $200,000 (1.4% of all taxpayers). Those individuals on average will pay an extra $5,255. While the reduction to the second tax bracket tax rate would affect more individuals, the average value of the tax cut is marginal for the bottom 70 per cent of earners (Table 5-1).

Table 5-1 Average tax savings by taxable income deciles

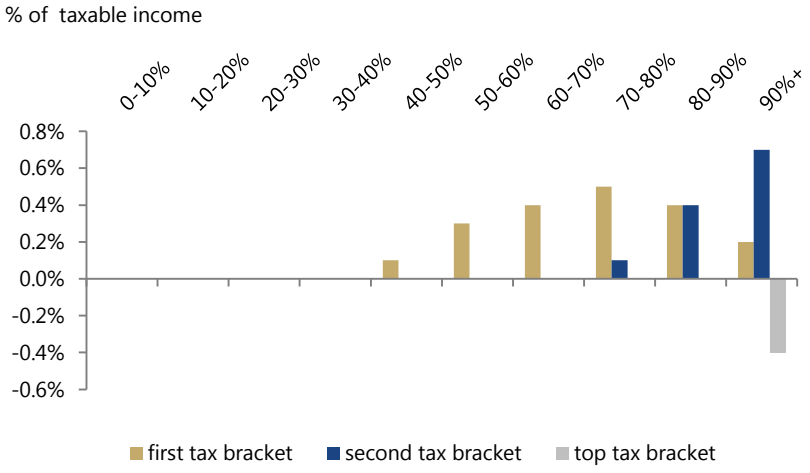
Changes to the first tax bracket would result in greater tax savings for more lower-income individuals than a tax cut to the second bracket

$ dollars	0-10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90%+
Top bracket	-	-	-	0	0	0	0	0	-2	-501
Second bracket	-	-	-	0	0	0	1	26	287	585
First bracket	-	-	-	0	21	73	167	250	267	261

Note: Values in table may not add due to rounding.

These estimates are consistent when looking at the tax savings (or additional taxes owed) as a share of taxable income (Figure 5-2).

Figure 5-2 Tax saving as a per cent of taxable income by taxable income deciles



Appendix A: Summary of Fiscal Impacts with and without the Family Tax Cut Credit

$ billions	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	Total
Net primary impact without Family Tax Cut Credit	-0.1	-0.3	-0.3	-0.3	-0.3	-0.3	-1.7
Of Which:							
Federal taxes	*-0.1*	*-0.3*	*-0.3*	*-0.3*	*-0.3*	*-0.3*	*-1.7*
Federal transfer income	*-0.0*	*-0.0*	*-0.0*	*-0.0*	*-0.0*	*-0.0*	*-0.0*
Behavioural response	-0.3	-1.3	-1.3	-1.4	-1.5	-1.5	-7.2
Net Impact without Family Tax Cut Credit	**-0.4**	**-1.6**	**-1.6**	**-1.7**	**-1.8**	**-1.9**	**-8.9**
Of Which:							
Second bracket	*-0.8*	*-3.4*	*-3.6*	*-3.7*	*-3.9*	*-4.1*	*-19.4*
Top bracket	*0.4*	*1.8*	*1.9*	*2.0*	*2.1*	*2.2*	*10.5*
Net primary impact with Family Tax Cut Credit	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-1.1
Of Which:							
Federal taxes	*-0.1*	*-0.2*	*-0.2*	*-0.2*	*-0.2*	*-0.2*	*-1.1*
Federal transfer income	*-0.0*	*-0.0*	*-0.0*	*-0.0*	*-0.0*	*-0.0*	*-0.0*
Behavioural response with Family Tax Cut	-0.4	-1.2	-1.3	-1.4	-1.5	-1.5	-7.2
Net Impact with Family Tax Cut Credit	**-0.5**	**-1.4**	**-1.5**	**-1.6**	**-1.7**	**-1.7**	**-8.3**
Of Which:							
Second bracket	*-0.8*	*-3.2*	*-3.4*	*-3.6*	*-3.8*	*-3.9*	*-18.8*
Top bracket	*0.5*	*1.8*	*1.9*	*2.0*	*2.1*	*2.2*	*10.5*

Source: Parliamentary Budget Officer.
Notes: The assumed behavioural response for the top bracket change is 0.38 and for the second bracket change is 0.10.
Figures are rounded to the nearest tenth decimal.

Appendix B: Methodology

The estimates of personal income tax changes in this report account for both primary and behavioural effects. Primary fiscal impacts include the increase or decrease in PIT revenue with an increase or decrease in the PIT rate, as well as the associated changes in federal transfer income. But it does not include the induced behavioural responses from the affected taxpayers.

Behavioural effects account for real economic behaviour (that is, increase or decrease in working hours, etc.) and efforts to reduce taxable income by the affected individuals resulting from changes in their marginal tax rates. The feedback into the macroeconomy from the primary and behavioural impacts is not accounted for in this report.

Primary impact

The primary impact of the changes in PIT rates is calculated using Statistics Canada's Social Policy Simulation Database and Model (SPSD/M v.22) and the federal tax projection from PBO's *Economic and Fiscal Outlook November 2015* (EFOU 2015).

By changing the PIT tax rate in SPSDM in blackbox mode, excluding the Family Tax Cut Credit and commodity taxes, PBO calculates the change in the federal fiscal impact (federal taxes less federal transfer income) resulting from:

- introducing a 33.0 per cent personal income tax rate on individual taxable income over $200,000 effective on January 1, 2016 and subsequent taxation years. For the primary impact, the affected base is taxable income above $200,000 in 2016.
- reducing the federal income tax rate on the second tax bracket (taxable income of $45,283 to $90,563) from 22.0 per cent to 20.5 per cent effective on January 1, 2016 and subsequent taxation years. For the primary impact, the affected base is taxable income above $45,283 in 2016.
- reducing the federal tax rate on the first income tax bracket by one percentage point (taxable income of $0 to $45,282 in 2016) effective on January 1, 2016 and subsequent taxation years. For the primary impact, the affected base is the total PIT tax base.

PBO adjusts the net federal fiscal impact from SPSDM of the above changes in PIT rates using the projection of federal taxes in the *Economic and Fiscal Outlook November 2015*. The net federal fiscal impacts are then converted into fiscal years.

PBO holds the fiscal impact to federal taxes ratio constant beyond 2019 as the last year of estimation in SPSDM version 22 is 2019.

Behavioural response

PBO uses ETI to account for the behavioural response of taxpayers to a change in their marginal effective rate. This is because changes in taxes may induce individuals to change their behaviour by altering their hours worked, changing the composition of potential income sources or changing their tax strategies.

The behavioural response from the changes in tax rates modifies the size of the government's tax base and, therefore, changes federal revenue. The ETI estimates the government's potential gain or loss in net revenue resulting from a reduction or increase in taxes through the changes in the size of the tax base.[13]

Since behavioural changes to tax rates occur on marginal income, the tax base used to derive the size of the behavioural response is limited to the affected income group.

Specifically, the tax base impacted by behavioural changes for the new 33.0 per cent personal income tax rate will be taxable income above $200,000. The base in reducing the federal income tax rate on the second tax bracket will be taxable income between $45,282 and $90,563. The base in reducing the federal tax rate on the first income tax bracket will be taxable income below $45,282 in 2016. These affected income bases are used to calculate the average marginal tax rates; the ETI is applied to calculate the new income bases.

Based on analysis from Finance Canada (2010), the estimated ETI is approximately 0.2 for those with real taxable income of about $60,000 per year or more.[14] However, recent literature from Milligan and Smart (2013, 2015) suggests that a large proportion of the ETI is attributable to taxpayers shifting income from one province to another.

In the case of a change in the federal marginal income tax rate, inter-provincial income shifting would not occur since the same federal tax rate applies, regardless of province of residence.

Therefore, PBO has adjusted the ETI net of the effects of inter-provincial shifting. For the first and second income bracket, PBO assumes an ETI of 0.10. For the new top income tax bracket, PBO assumes an ETI of 0.38.

PBO calculates the marginal tax rate based on SPSDM holding the percentage change in marginal tax rate constant from 2016 onward.

PBO estimated the federal change in tax revenues resulting from a behavioural response by applying the ratio of federal income taxes to the

estimated total change in the tax base.[15] In 2016, this share was roughly 61 per cent.

These results assume that pension income will not be shifted between spouses as a result of tax rate changes. Relaxing this assumption does not have a material effect on the overall results.

The same methodology was applied for estimating the behavioural effects by taxable income decile.

Distributional analysis

To measure the average dollar benefit, PBO used the difference in total taxes paid in a scenario where the new PIT rate was implemented, compared to the baseline scenario where there was no change to the PIT rates.[16]

Total taxes include federal and provincial taxes, which themselves include personal income taxes, Canada Pension Plan and Employment Insurance contributions, social benefit repayments, provincial health premiums, Quebec parental insurance plan premiums for paid workers, and Quebec parental insurance plan premiums for the self-employed.

The change in taxes paid was estimated by grouping individuals into income deciles based on individuals' taxable income. Taxable income refers to the Revenue Canada definition of Total Income (Line 150 on tax forms), less all deductions.

To estimate the value of the change in taxes payable as a per cent of taxable income, PBO used the baseline taxable income estimates for each income decile.

To estimate the percentage of taxpayers that would see a change in their total taxes payable, PBO identified the number of individual taxpayers with taxes greater than zero.[17] PBO estimated this separately for each scenario (that is, for each PIT change). Since the number of taxpayers can change as a result of changes in the PIT rates, PBO used the average number of taxpayers observed in each scenario as the estimated number of taxpayers.

PBO used the estimated number of individuals who experienced a change in their total taxes payable in combination with the estimated number of taxpayers to calculate the percentage of affected taxpayers.

The number of taxpayers was also used as the denominator to calculate the average dollar benefit across income groups. This is an important consideration when presenting average dollar benefits. There are more tax filers than there are taxpayers. Therefore, using tax filers as the denominator would instead produce a smaller average dollar benefit.

Similarly, if the dollar benefit were to be measured per Canadian – which would include children and other individuals who do not file taxes – the average dollar benefit would appear smaller.

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Notes

1. PBO has incorporated a behavioural response based on assumptions for the elasticity of taxable income (ETI). The ETI measures the changes in taxable income in response to changes in marginal tax rates. It is the percentage change in taxable income expected to result from a 1 per cent change in the after-tax value of a marginal dollar of taxable income
2. The fiscal impact of the proposed changes to federal personal income tax rates assumes that the Family Tax Cut Credit (FTCC) will be repealed for the 2016 filing year. Appendix A provides details regarding the fiscal impact of PIT changes with and without the FTCC.
3. Source: Statistics Canada, SPSDM, version 22.0, 2016.
4. The 17.9 million refers to the total individuals with at least one dollar of taxable income up to $45,282 in 2016.
5. http://www.fin.gc.ca/taxexp-depfisc/2010/taxexp1003-eng.asp
6. http://www.fin.gc.ca/taxexp-depfisc/2010/taxexp1003-eng.asp#tocpart2-11
7. http://www.fin.gc.ca/taxexp-depfisc/2010/taxexp1003-eng.asp#tocpart2-11
8. http://webarchive.nationalarchives.gov.uk/20130129110402/ http:/www.hmrc.gov.uk/budget2012/excheq-income-tax-2042.pdf
9. Total taxes includes income taxes, CPP/QPP and EI contributions, social benefit repayments, provincial health premiums, Quebec parental insurance plan premiums for paid workers, and Quebec parental insurance plan premiums for the self-employed.
10. The calculation of the behavioural effect assumes that pension income would not be shifted in response to the change in PIT rates. See Appendix B for more information.
11. This is not 100 per cent of taxpayers, because there are sources of tax revenues that are not affected by changes to PIT rates such as the Canadian Pension Plan and Employment Insurance contributions. Individuals with income less than the sum of their basic tax credits will still pay these taxes – hence be a taxpayer – but will not be affected by changes to PIT rates.
12. These impacted individuals include both those with income in the affected tax bracket, as well as individuals with spouses in the affected tax bracket, to whom they transfer tax credits to or from whom they receive tax transfers.
13. For more information on the definition of ETI, please refer to http://www.pbo-dpb.gc.ca/web/default/files/files/files/ReadyReckonerGuide_EN.pdf
14. http://www.fin.gc.ca/taxexp-depfisc/2010/taxexp1003-eng.asp

15. Alternatively, researchers could calculate the change federal MTR rather than the change in total MTR.
16. As legislated, the federal tax credit rate was assumed to match that of the lowest tax rate.
17. PBO used the taxable income measured in the shock scenario. That is, taxable income greater than zero in the scenario where there is a change to PIT rates.