OFFICE OF THE PARLIAMENTARY BUDGET OFFICER
CANADA
BUREAU DU DIRECTEUR PARLEMENTAIRE DU BUDGET

The Family Tax Cut

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Executive Summary

The Family Tax Cut (FTC), commonly referred to as income splitting, permits a spouse to notionally transfer up to $50,000 of taxable income to a spouse facing a lower federal tax rate.

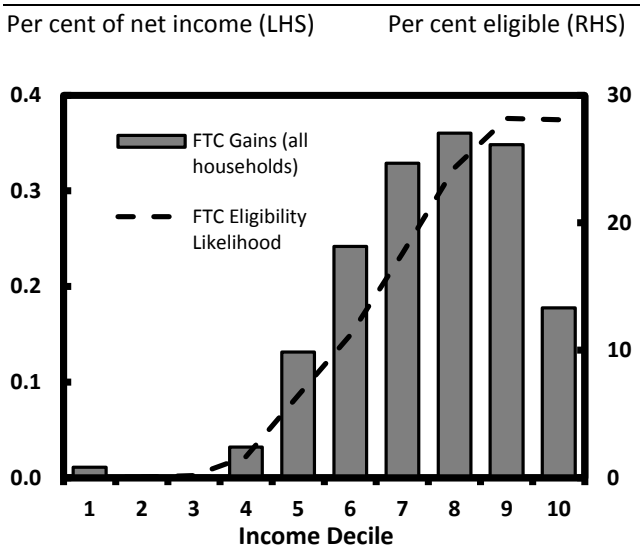
Federal tax rates increase incrementally with income so, in general, a higher earning partner (primary earner) notionally transfers income to their lower earning partner (the secondary earner) to generate FTC gains.

FTC benefits are restricted to households with children under age 18, to an upper limit of $2,000 in reduced tax per household, per year.

PBO projects that the FTC will reduce government revenues by about $2.2 billion in 2015.

The FTC benefits about 2 million households, or 15 per cent of the Canadian total. Middle and middle-high income households benefit most because they are more likely to have a family income and income tax structure conducive to FTC gains (Figure S-1).

Figure S-1: Family Tax Cut distributional impacts



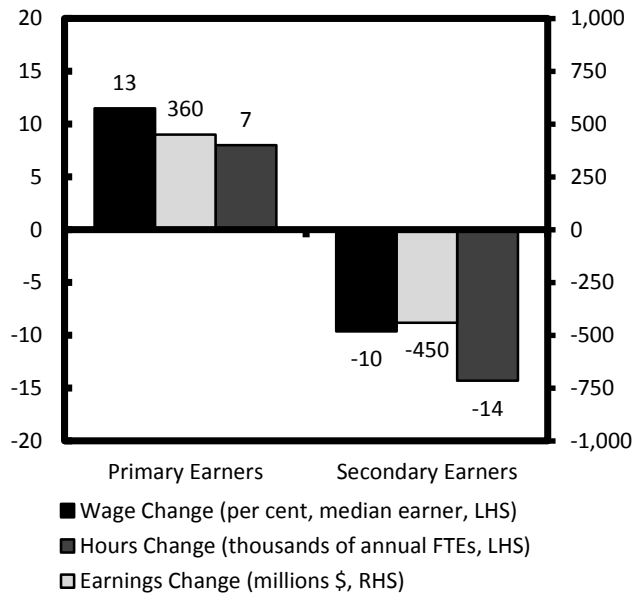
Source: Parliamentary Budget Officer.

The FTC changes marginal effective wages, influencing labour supply decisions within eligible households. The labour supply is a key determinant of an economy's underlying productive capacity and a driver of economic growth.

Primary earners benefit from higher marginal effective wages. They respond by increasing their labour supply by 7,000 full-time annual equivalents (FTEs) and $360 million in labour income. Secondary earners face lower marginal effective wages and reduce their labour supply by 14,000 FTEs and $450 million in income (Figure S-2).

Overall, PBO projects that the FTC results in a small net reduction in the labour supply of about 7,000 FTEs and a $90 million decline in labour income. These net effects represent less than 0.04 per cent of the total hours of labour supplied and less than 0.01 per cent of total employment income.

Figure S-2: Family Tax Cut labour supply impacts



Source: Parliamentary Budget Officer.

1 What is the fiscal impact of the Family Tax Cut?

PBO estimates the Family Tax Cut, (FTC) will have a net fiscal impact of $2.2 billion in 2015.[1,2] This amount accounts for effects on revenues and expenses for the federal government and accounts for taxpayer response to FTC-generated changes in effective tax rates.

Unlike pension income splitting, where income is actually transferred between partners on the federal tax form, the FTC is calculated through a notional income transfer.

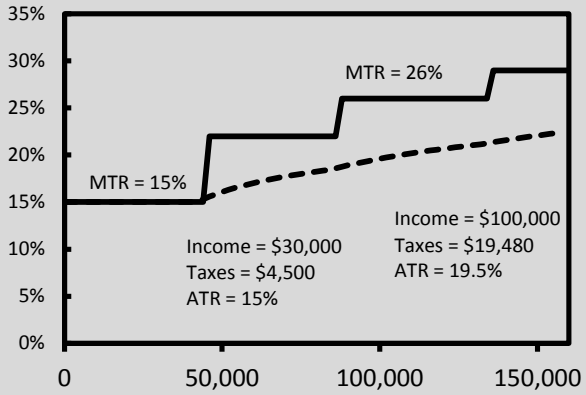
It is delivered as a federal non-refundable credit and thus, does not directly affect the taxable income base for provincial income taxes or federal and provincial benefits. PBO projects the FTC to have a negligible impact on provincial revenues.[3]

Finance Canada calculates the federal fiscal impacts of the FTC at $1.935 billion. Differences arise from model assumptions and estimation differences.[4]

Box 1-1: What is the Family Tax Cut?

The Family Tax Cut, commonly referred to as income splitting, permits a spouse to notionally transfer up to $50,000 of taxable income to a spouse facing a lower federal tax rate. Federal tax rates increase incrementally with income so, in general, a higher earning partner (the primary earner) will notionally "transfer" income to their lower earning partner (the secondary earner) to generate FTC gains.

The figure below illustrates a simulated household with $130,000 in taxable income: with $100,000 earned by the primary earner and $30,000 by the secondary. **Without the FTC,** the primary earner faces a federal tax rate of 26 per cent on the last dollar of income, while the secondary earner has a federal tax rate of 15 per cent. The household owes $23,980 in federal tax.



With the FTC, the household calculates total taxes using the same $130,000 household income, but simulated as two taxpayers, each making $65,000. Their federal tax in this simulation would be $22,440, or **$1,540 less** than otherwise payable without the FTC. The primary earner can claim this amount as a FTC credit, which is then subtracted from their federal taxes payable. FTC benefits cannot exceed $2,000 in reduced tax per household.

[1] The FTC takes effect, retroactively, for the 2014 tax year onward.

[2] 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 the authors and the responsibility for the use and interpretation of these data is entirely that of the authors.

[3] Examples of federal and provincial benefits and tax credits unaffected by the FTC include the GST/HST credit, the Canada Child Tax Benefit and the age amount.

[4] Finance Canada estimates are provided on a fiscal year (April 2015 to March 2016), rather than tax year (January to December 2015) basis http://www.fin.gc.ca/n14/data/14-155_1-eng.asp. Accessed March 2015.

2 Who is affected?

The FTC affects a relatively narrow subset of beneficiaries, about 2 million households, or 15 per cent of the Canadian total.

Three key eligibility criteria lead to this result:

(i) the FTC is limited to married or common-law individuals;

(ii) the FTC is limited to individuals with children under the age of 18; [5] and,

(iii) in practice, the FTC benefits only those households with a disparity in effective federal income tax rates applicable on the primary and secondary earners, as illustrated in Box 1-2.

In FTC-eligible families, primary earners predominantly work full-time hours and have a gross wage rate that is roughly double that of secondary earners (Table 2-1).

Table 2-1: Family Tax Cut: Descriptive statistics

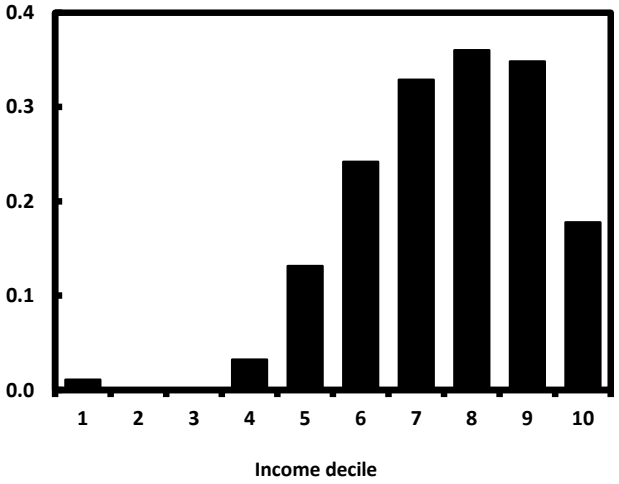
	Primary Earners	Secondary Earners
Individuals Impacted	1,980,000	1,980,000
In Labour Force	1,970,000	1,590,000
Annual Income (median)	75,000	25,000
Weekly Hours (median)	40	29
Hourly Wage (median)	36	18
% Part-time	3%	31%

Source**s**: Parliamentary Budget Officer; The Social Policy Simulation Database and Model (SPSD/M) v. 21.

The largest FTC gains are realized by households in the 80th income decile, with average gains of about 0.4 per cent of after-tax income (Figure 2-2). These gains are averages for both affected and unaffected households.

Figure 2-2: Family Tax Cut: Distributional impact

Per cent of after-tax income



Source: Parliamentary Budget Officer.

Total benefits per income decile are contingent on both the likelihood of eligibility for FTC benefits and the average benefits received by eligible households (Figure 2-3).

Figure 2-3: Family Tax Cut: Eligibility

Per cent of after-tax income

Total Gains = Gains (if eligible) x Eligibility Likelihood

Source: Parliamentary Budget Officer.

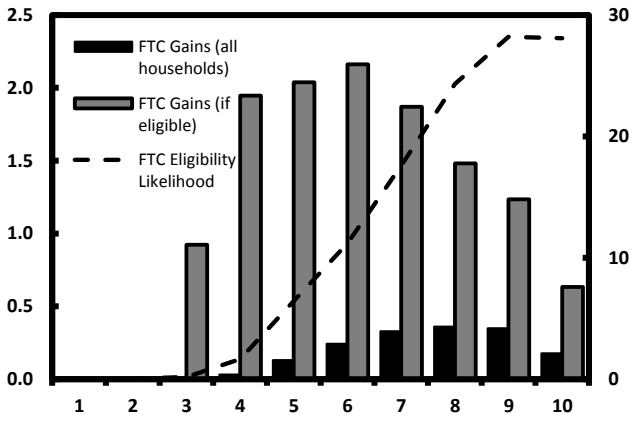
The FTC benefits medium- through high-income households primarily because they are more likely to have a family income and income tax structure conducive to FTC gains.

FTC eligibility rates for households in the bottom 20 per cent of income are near zero. On the other hand, about 27 per cent of households in the 80th percentile of income and better are projected to benefit from the FTC (Figure 2-4).

[5] For parents with joint custody arrangements, both custodial parents can claim the credit for the year, provided the parent has an eligible spouse or common-law partner. In these cases, two households can benefit from the credit.

Figure 2-4: Family Tax Cut: Distributional impacts

Per cent of after-tax income



Source: Parliamentary Budget Officer.

Note: Average FTC gains for the first two income deciles are not depicted because small sample size prohibits a statistically reliable measurement. Amounts are not expected to be fiscally material.

However, if eligible, households in the fourth to sixth income deciles are projected to receive larger gains as a share of after tax income than higher- and lower-income counterparts.

Gains are distributed differently across family income structures, dependent on the incomes of both primary and secondary earners.

The highest per family gains are concentrated among those with high primary incomes and relatively low secondary incomes (See the bottom-left corner of Figure 2-5). Households with relatively balanced taxable earnings between spouses receive relatively lower FTC benefits, all else equal.

Figure 2-5: Distribution of average benefits by family taxable income structure, eligible households only (dollars)

Primary Income (thousands of dollars) \ Secondary Income (thousands of dollars)	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90+
0-20	250	180	-	-	-	-	-	-	-	-
20-30	440	260	330	-	-	-	-	-	-	-
30-40	830	370	340	390	-	-	-	-	-	-
40-50	1,290	290	180	180	120	-	-	-	-	-
50-60	1,760	740	640	550	160	-	-	-	-	-
60-70	1,920	1,370	1,230	700	160	-	-	-	-	-
70-80	1,920	1,870	1,370	650	190	-	-	-	-	-
80-90	1,920	1,930	1,390	670	180	-	-	-	-	-
90-100	1,930	1,940	1,560	860	260	170	230	190	140	-
100+	1,920	1,940	1,830	1,670	1,370	1,200	1,120	850	470	630

Source: Parliamentary Budget Officer.

Figure 2-6: Distribution of total benefits by family taxable income structure (millions of dollars)

Primary Income (thousands of dollars) \ Secondary Income (thousands of dollars)	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90+	Total
0-20	-	-	-	-	-	-	-	-	-	-	-
20-30	15	5	-	-	-	-	-	-	-	-	20
30-40	80	5	-	-	-	-	-	-	-	-	85
40-50	140	15	5	5	-	-	-	-	-	-	165
50-60	150	40	35	40	5	-	-	-	-	-	270
60-70	140	85	60	30	5	-	-	-	-	-	320
70-80	115	65	40	30	5	-	-	-	-	-	255
80-90	90	35	35	20	5	-	-	-	-	-	185
90-100	85	25	30	20	5	5	-	-	-	-	170
100+	250	110	105	70	55	60	30	30	15	25	750
Total	1,065	385	310	215	80	65	30	30	15	25	2,220

Source: Parliamentary Budget Officer.

3 How are eligible households affected?

FTC reduces average household taxes uniformly…

For all eligible households, the FTC reduces the amount of federal income taxes payable. Since the FTC is implemented by allowing primary earners to deduct the credit from final taxes owing, it directly reduces the primary earner's average effective tax rate (AETR). For the median household, the AETR declines by 0.8 percentage points.

But marginal tax rates are affected differently for primary and secondary earners

In Canada's progressive income tax structure, higher income individuals generally face higher **marginal effective tax rates** (METR). (See Box 1-1 on page 2 for an illustration).

Thus, the FTC (notionally) affects the taxable income of both partners in an affected household. In the FTC benefits calculation, transferred income decreases the primary earner's taxable income and METR, and increases the secondary earner's taxable income and METR.

In a household with an even (notional) split of income, the METR will converge for both partners (Table 3-1). For the median household, the FTC will decrease the primary earner's METR by 7 percentage points, and increase the secondary earner's METR by 7 percentage points.

Table 3-1: Family Tax Cut: Marginal effective tax rates

Per cent, median earner

	Status Quo	FTC	Change
Primary	43%	36%	-7 p.p.
Secondary	29%	36%	+7 p.p.

Sources: Parliamentary Budget Officer; The Social Policy Simulation Database and Model (SPSD/M) v. 21. The above rates are inclusive of federal and provincial taxes net of transfers for working individuals.

Lower (higher) METRs directly affect the marginal effective wage. PBO estimates that the FTC increases the median primary earner's marginal effective wage by 13 per cent, from $20.10 an hour to $22.70 an hour. It reduces the median secondary earner's marginal effective wage by 10 per cent, from $11.70 an hour to $10.60 an hour (Figure 3-3).

Box 3-2

Average and marginal effective tax rates and wages

A worker's average effective wage is inversely proportional to their average effective tax rate (AETR). For most workers, the tax deductions on their pay cheque divided by their gross pay would roughly correspond with their AETR.

$$WAGE_{net} = (1 - AETR) \times WAGE_{gross}$$

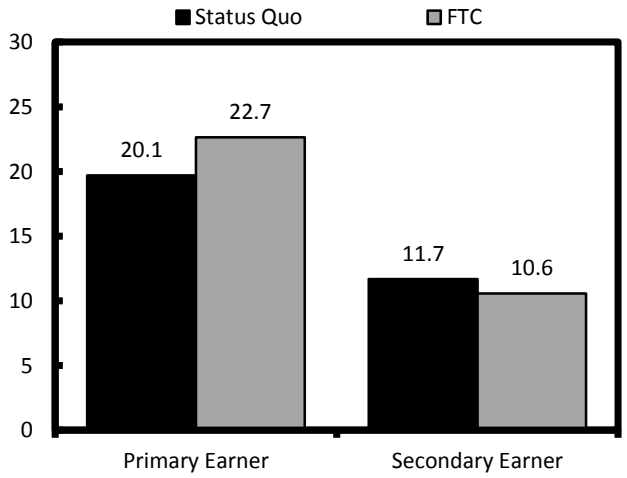
Similarly, a worker's marginal effective wage on an additional hour worked is inversely proportional to their marginal effective tax rate (METR). For many workers, this would roughly correspond to the highest income tax bracket reached during the year.

$$WAGE_{net} = (1 - METR) \times WAGE_{gross}$$

Source: Parliamentary Budget Officer.

Figure 3-3: Change in marginal effective wage

$/hour, median earner



Source: Parliamentary Budget Officer.

4 What are the broader labour supply effects?

PBO projects that the FTC has a small negative impact on total labour supply.

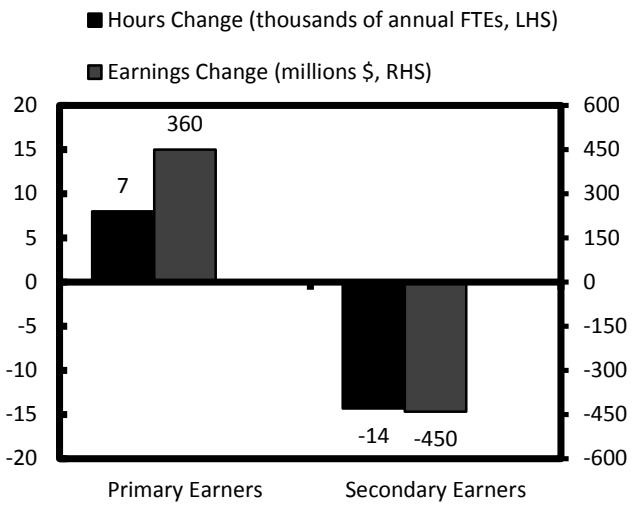
The FTC directly affects marginal effective wages, which are a key determinant of a worker's decision about how much labour to supply. Numerous economic studies have found that workers respond to changes in marginal effective wages by adjusting hours, effort or their participation in the labour force entirely.[6] The labour supply is a key determinant of an economy's underlying productive capacity and a driver of economic growth.[7]

PBO projects that higher marginal effective wages under the FTC induce primary earners to increase their labour supply by 7,000 full-time annual equivalents (FTEs), resulting in about $360 million in additional income (Figure 4-1).[8]

Conversely, secondary earners, who face lower marginal effective wages, reduce their labour supply by 14,000 FTEs. This corresponds to about $450 million in reduced labour income. A key driver of this result is the greater responsiveness of secondary earners to wage changes.

Overall, PBO projects that the FTC leads to a small net reduction in total labour supply of about 7,000 full-time annual equivalents, and a decline of about $90 million in labour income. These net effects represent less than 0.04 per cent of the total hours of labour supplied and less than 0.01 per cent of total employment income (Figure 4-2).

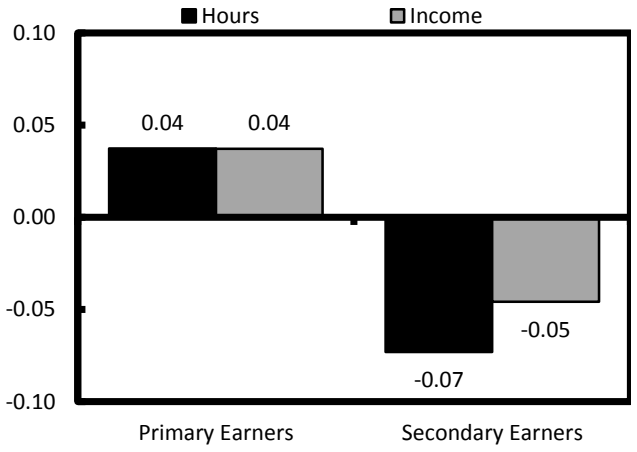
Figure 4-1: FTC impact on labour supply



Source: Parliamentary Budget Officer.

Figure 4-2: FTC impacts as a share of aggregate hours and labour income

Percentage of total hours supplied, total labour income



Source: Parliamentary Budget Officer

[6] For a summary see the Organization of Economic Co-operation and Development (OECD), 2011 "The Effects of Taxation on Employment: An Overview".

[7] Annual hours worked by individuals are a key component of PBO's trend labour input which is used for estimating potential GDP. PBO, 2010. "Estimating Potential GDP and the Government's Structural Budget Balance." http://www.pbo-dpb.gc.ca/files/files/Publications/Potential_CABB_EN.pdf. Accessed March 2015.

[8] PBO defines one full-time equivalent (FTE) as equal to 35 hours * 52 weeks, or 1,820 hours per year.

This microanalysis presents a static impact of the FTC on labour supply decisions at a given point in time and should not be considered a comprehensive forecast of the change in actual hours worked in the economy. The latter is determined by the forces of labour supply and demand, including adjustments to gross wage rates and aggregate demand.

Given this caveat, PBO considers these estimates of labour supply impacts to be a best estimate of potential outcomes. Sensitivity analysis is included in Annex A and an explanation of methodological assumptions is included in Annex B.

Annex A – Sensitivity Analysis

PBO estimates are sensitive to the following specifications and assumptions:

(i) the regulatory limit of $2,000 in tax savings and a $50,000 transfer of income under the FTC; and,

(ii) the relative responsiveness to changes in METRs (or the uncompensated wage elasticity) of primary and secondary earners.

In general, PBO's estimate of the net impact of the FTC on labour income is more sensitive than that of hours worked.

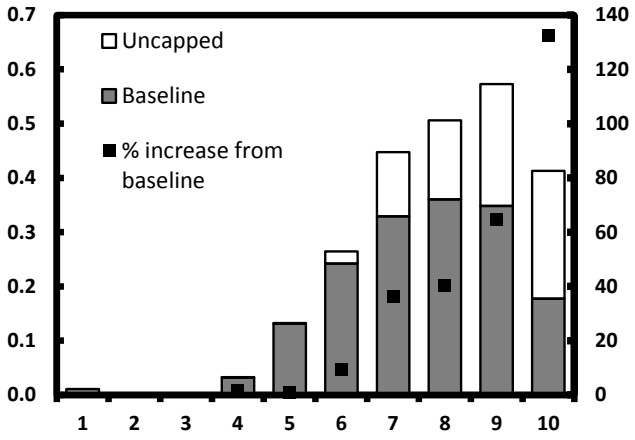
Effect of FTC $2,000 benefits cap and $50,000 transfer limit

Once a household reaches $2,000 in tax savings or a $50,000 transfer of income under the FTC, it is no longer eligible to continue to receive the credit (hereafter referred to as "capped'). These limits reduce the fiscal impact of the FTC by about $1.5 billion.

These limits also affect the distributional outcomes of the FTC, limiting the benefits for the highest income households. Without a cap, FTC gains for the 90th percentile income households and above would be more than twice the baseline (Figure A-1). Conversely, FTC gains to the median income deciles are not materially affected by the cap.

Figure A-1: Distributional impacts of the FTC limits

Per cent of after-tax income



Source: Parliamentary Budget Officer.

The cap also affects the labour supply decision within households, because the METR is not affected for each spouse within a capped household. [9]

Therefore, PBO assumes that if the primary earner is capped under the FTC before or after their respective labour supply response, there is no labour supply response by the secondary earner. Labour supply estimates in section 3 incorporate the FTC cap.

PBO estimates that about one-third of households are capped after including projected labour supply responses (Table A-2).

Table A-2: Capped households

Number of households

	Households
$2,000 in tax savings	585,000
labour supply response	50,000
$50,000 transfer	7,000
Total	642,000

Source: Parliamentary Budget Officer.

Under an uncapped FTC, PBO estimates that the FTC would continue to have a small negative impact on hours worked, but a positive impact on labour income.

As shown in Figure 2-5, the cap is more binding on households in which there exists a greater income disparity between partners. This implies that primary (secondary) earners with high (low) incomes are more likely to be capped.

Without a cap, PBO projects that primary earners would increase labour supply by about 16,000 FTEs, and $1.2 billion in additional labour income. The corresponding secondary earner response would be to reduce labour supply by about 23,000 FTEs and $630 million in income (Table A-3 and A-4).

[9] An exception would be for households which are capped at the margin of FTC limits.

Table A-3: Cap impact: hours

Thousands of FTE equivalent annual hours

	Capped	Uncapped
Primary Earners	7,000	16,000
Secondary Earners	-14,000	-23,000
Net	-7,000	-7,000

Source: Parliamentary Budget Officer.

Table A-4: Cap impact: income

Millions of dollars of labour income

	Capped	Uncapped
Primary Earners	360	1,230
Secondary Earners	-450	-630
Net	-90	600

Source: Parliamentary Budget Officer.

Labour supply estimate sensitivity

PBO estimates of the changes in hours and income induced by the FTC are also sensitive to the assumptions regarding the uncompensated wage elasticity of workers.[10] PBO's baseline assumptions are an elasticity of 0.035 for primary earners and 0.17 for secondary earners.

In general, PBO's labour supply estimates are sensitive to:

(i) the relative difference in responsiveness between primary and secondary earners. Greater responsiveness of secondary earners, historically married women with children, is a core empirical finding; and,

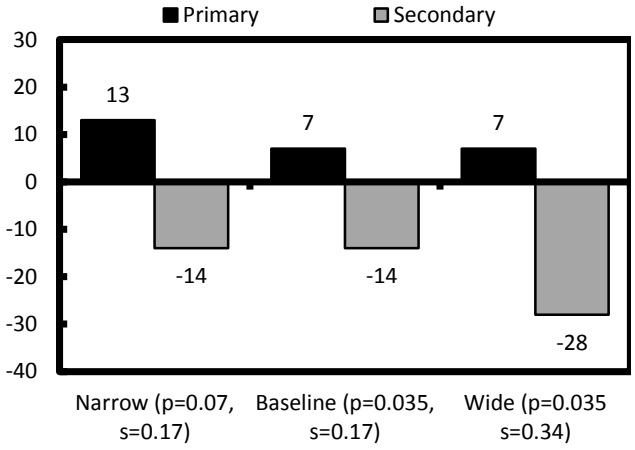
(ii) the level of responsiveness of both spouses' labour supply decision.

A narrower (wider) gap in elasticities than the PBO baseline has a positive (negative) impact on labour supply compared to the status. If the elasticity of the primary earner is doubled, while the secondary's held constant, there remains a small negative labour supply impact on hours (Figure A-5) and a small positive impact on labour income (Figure A-6).

[10] See Annex B for a more detailed discussion of labour supply elasticity assumptions.

Figure A-5: Sensitivity of labour supply response to relative elasticity of earners

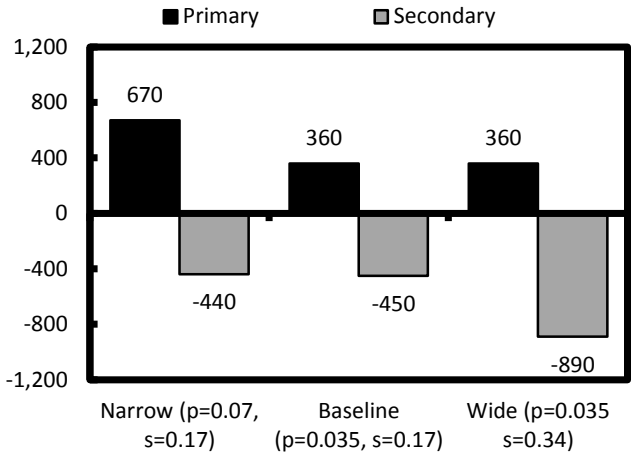
Thousands of FTE equivalent annual hours



Source: Parliamentary Budget Officer.

Figure A-6: Sensitivity of labour income response to relative elasticity of earners

Millions of dollars of labour income

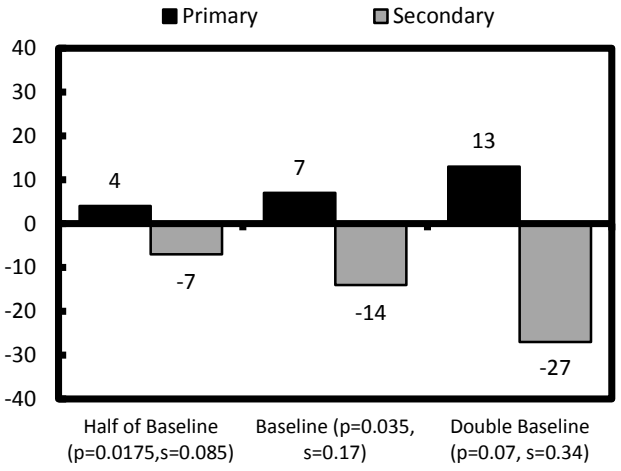


Source: Parliamentary Budget Officer.

The magnitude of the FTC's impacts on labour supply is accentuated when the estimated responsiveness of both spouses is increased. The FTC also has a slightly more negative net impact on hours (Figure A-7) and income (Figure A-8) because the FTC cap constrains the behavioural response of households with a larger earnings disparity.

Figure A-7: Sensitivity of labour supply response to magnitude of elasticities

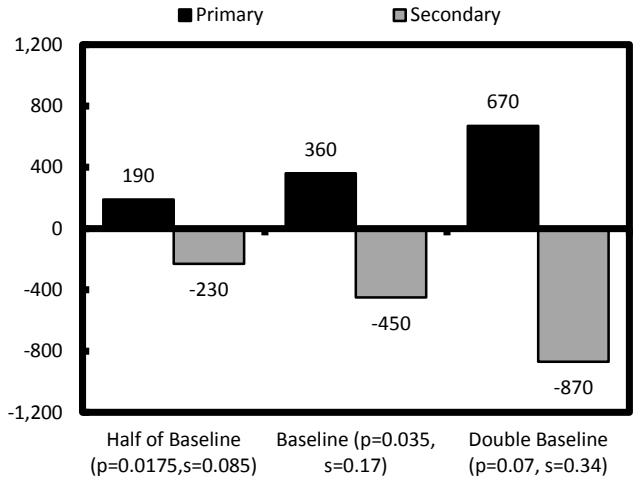
Thousands of FTE equivalent annual hours



Source: Parliamentary Budget Officer.

Figure A-8: Sensitivity of labour income response to magnitude of elasticities

Millions of dollars of labour income



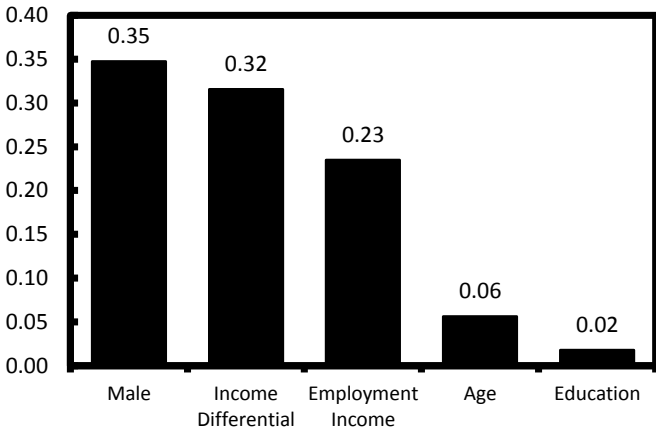
Source: Parliamentary Budget Officer.

Sensitivity of explanatory variables affecting labour market responsiveness

The non-tax characteristics most correlated with labour supply response are gender, the income differential between earners, and the employment income of an earner (Figure A-9).[11]

Figure A-9: Correlation with labour supply response

Ordinary correlation coefficient



Source: Parliamentary Budget Officer.

Comparison with a broad-based reduction in personal income taxes

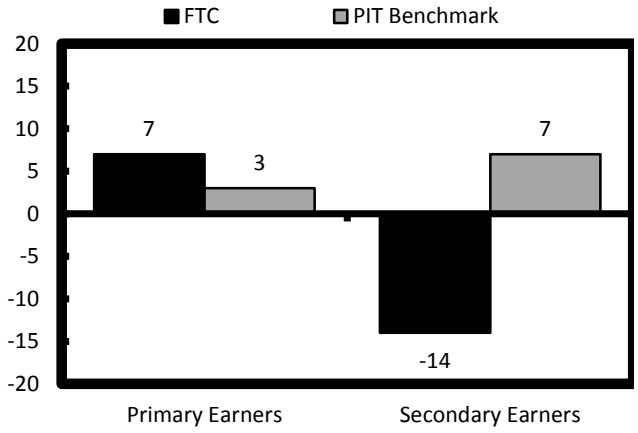
PBO also compares the impacts of the FTC to a broad-based measure – a reduction of the statutory rates on all income tax brackets by 30 basis points (bp). The 30 basis point reduction (referred to in the figures below as "PIT benchmark") has a roughly equivalent static fiscal impact as the FTC.

Overall, the FTC's impact is larger in magnitude than the PIT benchmark for both earners. However, changes in hours and labour income are uniformly positive under the PIT benchmark as opposed to a net negative impact under the FTC (Figures A-10 and A-11).

[11] These figures are ordinary partial correlations, meaning they do not control for interdependence between variables.

Figure A-10: FTC vs. PIT benchmark

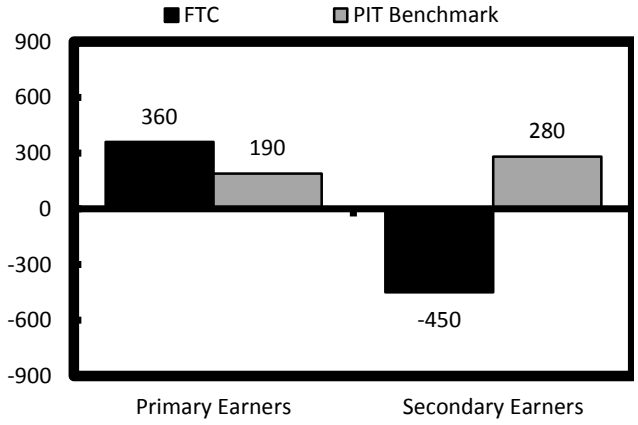
Thousands of FTE equivalent annual hours



Source: Parliamentary Budget Officer

Figure A-11: FTC vs. PIT benchmark

Millions of dollars of labour income



Source: Parliamentary Budget Officer

Annex B – Methodology & key assumptions

How income taxation affects the supply of labour

Income taxes reduce effective wages (see Box B-1), which lowers the gains from labour and raises the relative value of non-work activities, such as leisure or uncompensated household production.

A number of studies have found that workers are responsive to changes to income taxes through the wage channel.[12] For example, workers may adjust hours, effort or their participation in the labour force entirely.

How does PBO estimate average and marginal effective tax rates?

The average effective tax rate is estimated as income tax and other compulsory payments less government transfers, divided by the sum of market income.[13,14]

The marginal effective tax rate is estimated as the incremental income tax (and other compulsory payments less government transfers) due on an additional $1,000 of employment income.

PBO focuses on the marginal effective wage for labour supply estimates because this is the rate at which workers make the decision on whether to supply one additional hour of labour.

Box B-1: Average vs. marginal effective wages

A worker's average effective wage is inversely proportional to their average effective tax rate (AETR). For most workers, the tax deductions on their pay cheque divided by their gross pay would roughly correspond with their AETR.

$$WAGE_{net} = (1 - AETR) \times WAGE_{gross}$$

Similarily, a worker's marginal effective wage on an additional hour worked is inversely proportional to their marginal effective tax rate (METR). For many workers, this would roughly correspond to the highest income tax bracket reached during the year.

$$WAGE_{net} = (1 - METR) \times WAGE_{gross}$$

The per cent change in of a workers marginal effective wage following a change in policy from $METR_1$ to $METR_2$ can be calculated as follows:

$$\%\Delta WAGE_{NET} = \frac{(METR_1 - METR_2)}{(1 - METR_1)}$$

A 10 p.p. reduction in marginal tax rates will have a larger impact on the marginal effective wage of a worker with a METR of 50% (ΔWAGE = 20%) than a worker with an METR of 20% (ΔWAGE = 12.5%).

Source: Parliamentary Budget Officer.

How does PBO calculate workers' responsiveness to wage changes?

The responsiveness of workers to changes in their effective wage is measured through their "uncompensated wage elasticity" (Box B-2). Hereafter, this will be referred to as "elasticity".[15]

PBO draws upon the results of a meta-study by Evers, Mooij and Van Vuuren (2008) which analyzes 209 elasticity estimates from 30 empirical studies over 1981 to 2007.[16] The mean values of their analyses are shown in Table B-3.

[12] See OECD "Effects of Taxation on Employment: An Overview." (2011), Evers, Mooij and Van Vuuren (2008) and Bargain & Peichl (2013) for a review and analysis of the literature.

[13] Compulsory payments include Employment Insurance, benefits repayments and the Canada (Quebec) Pension Plan.

[14] Market income includes income from employment, investments, pensions and other sources.

[15] This elasticity represents the net effect of the substitution effect (a worker supplies more (less) labour when they are paid more (less) to do so) and income effect (a worker supplies less (more) labour because under a higher (lower) wage, less (more) work is required to maintain a given standard of living.

[16] The authors aim to contribute a synthesis of research results on the size of elasticities to be used in policy analysis. Their findings are consistent with another meta-study by Bargain & Peichl (2013).

Box B-2: Uncompensated wage elasticity

The uncompensated wage elasticity (UWE) follows the standard economic definition of elasticity, measuring the per cent change in hours worked when the marginal effective wage increases by 1 per cent.

$$UWE = \frac{(1 - METR)}{HOURS} \times \frac{\Delta HOURS}{\Delta METR}$$

Source: Parliamentary Budget Officer.

There is considerable literature devoted to estimating this elasticity. Although there is uncertainty over the exact values for different workers, there is a general consensus that elasticities for men and single women are positive and close to zero, while the elasticities for married women are much higher than those of men. This is attributed to the following factors:

(i) traditional division of labour market within the family including greater responsibilities for women for childcare and home production; and,

(ii) secondary earners, by definition, face a lower opportunity cost of devoting time to non-work activities and are more likely to work in jobs that are part-time or allow for flexibility in hours worked.

Table B-3: International average elasticities

Mean value

	Men	Women
Mean elasticity	0.07	0.34

Source: Evers, Mooij and Van Vuuren (2008) meta-analysis of over 30 empirical studies over 1981-2007. Outliers are excluded.

Elasticities of women have declined over time in line with their stronger attachment to the labour force.[17] Therefore, PBO does not distinguish workers by sex, but instead uses the elasticities of men for primary earners and married women for secondary earners.

This practice is consistent with the United States Congressional Budget Office (CBO).[18]

PBO uses elasticities of 0.035 for primary earners and 0.17 for secondary earners, which are equal to half of the averages derived by Evers, Mooij and Van Vuuren (2008).

This follows Finance Canada analysis on the responsiveness of taxable income to changes in marginal tax rates, which suggests that Canadians' behavioural responsiveness is roughly half that of international counterparts.[19]

PBO maintains a gap between the elasticity of primary and secondary earners for the following reasons:

(i) applying the elasticities by relative earnings instead of gender controls for some of the convergence in responsiveness between men and women, as a greater number of women are primary earners than in the past;

(ii) when controlling for increasing female participation and time trends, studies confirm a gap between the elasticities of primary and secondary earners within households; and,

(iii) FTC-eligible households are comprised entirely of married or common-law secondary earners with children. They are more responsive than those without children.

How does PBO estimate the effect of the FTC on the aggregate supply of labour?

PBO follows closely the methodology of the CBO for estimating static labour supply outcomes in response to changes in tax policy.[20]

The labour supply response of each of worker, as measured by the change in their annual hours and income, is calculated using the per cent change in their marginal effective wage and the worker's corresponding elasticity (Box B-4). Changes in hours

[17] Blau & Kahn, 2006. "Changes in the Labor Supply Behavior of Married Women: 1980-2000."

[18] CBO, 2012. "How the Supply of Labour responds to Changes in Taxation."

[19] Finance Canada, 2010. "The Response of Individuals to Changes in Marginal Income Tax Rates."

[20] Congressional Budget Office, 2012. "How the Supply of Labour Responds to Changes in Fiscal Policy."

and income at the individual level are aggregated to produce an estimate of the static change in labour supply across the economy.

Box B-4: Aggregate labour supply response

Re-arranging the formula from Box B-2, the labour supply response of a given worker, measured in hours worked per year, is determined by multipying the per cent change in the marginal effecitve wage by the worker's labour supply elasticity and by the total hours worked per year:

$$\Delta HOURS_i = \ \%\Delta WAGE_{NET,i} * \mathrm{EHW}_i * \mathrm{HOURS}_i$$

The impact on the aggregate labour supply is the sum of individual responses. This represents a static, steady state impact of the hours workers are willing to work given before-tax wage rates and aggregate demand:

$$\Delta HOURS_{TOTAL} = \sum_{i=1}^{n} \Delta HOURS_i$$

The change in labour income is determined by multipying the change in hours induced by each workers gross hourly wage rate. Individual changes are aggregated to produce a total estimate.

$$\Delta INCOME_i = \ \Delta HOURS_i * \mathrm{WAGE}_i$$

Source: Parliamentary Budget Officer

Such impacts do not account for second order effects relating to the dynamic adjustments of the economy. According to the OECD, a microeconomic approach is preferable to account for the heterogeneity of workers and to fully capture the nuances of tax policy changes.[21]

Nevertheless, this microanalysis should not be considered a comprehensive forecast of the change in actual hours worked in the economy as a whole. The latter is determined by the forces of labour supply and demand, including adjustments to gross wage rates and aggregate demand.

[21] OECD "The Effects of Taxation on Employment: An Overview" (2011)

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