

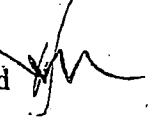


Department of Finance Canada
Ministère des Finances Canada

MEMORANDUM NOTE DE SERVICE

Security classification	Classification de sécurité
SECRET	
Originator	Auteur
Elizabeth Cook/Carlos Rodriguez/ Andrew Pratt/Dominique Fleury	
Our file	Notre référence
TPB 3740-003	
Your file	Votre référence
2019FIN490166	
Date	
NOV 05 2019	

TO
À Paul Rochon

FROM
DE Andrew Marsland 

SUBJECT
OBJET Effective Marginal Tax Rates for Individuals – Update and Distributional Analysis

For information only. The attached research papers provide updated and new information on the effective marginal tax rates faced by individuals in Canada.

Summary



This memo presents the key findings of these two research papers: (1) Update on Effective Marginal Tax Rates and Participation Tax Rates for Individuals; and, (2) Distributional Analysis of Effective Marginal Tax Rates for Individuals.

s.21(1)(a)

s.21(1)(b)

SADM: Andrew Marsland (613-369-3739)

Director General: Pierre LeBlanc (613-369-5721) / Directeur Général: Pierre LeBlanc (613-369-5721)

000001

1. Update on Effective Marginal Tax Rates and Participation Tax Rates for Individuals

Background

- This paper updates our analysis of EMTRs and PTRs facing Canadians. For the first time, we also incorporate estimates of the incremental impact of childcare costs on the financial returns to entering (or remaining in) the work force for secondary earners with young children.
- The paper focuses on Ontario but includes discussion of other jurisdictions. Estimates of EMTRs and PTRs may not be reflective of all financial disincentives to work that result from the tax and transfer system, as they do not include certain benefits related to housing, education, and health care that are difficult to value or narrowly targeted (see Annex B of paper).

Main findings

- This paper estimates EMTRs and PTRs faced by “typical” working-age Canadians in 2019, and shows how these rates have changed in Ontario between 2014 and 2019.
 - Clawback of social assistance is an important source of high EMTRs, as is shown in this paper for unattached individuals. For example, in 2019, EMTRs for unattached individuals on social assistance in Ontario peak – at between 60 and 70 per cent – on earnings from \$15,000 to \$24,000. Their counterparts not receiving social assistance face much lower EMTRs over this earnings range, closer to 30-40 per cent of each additional dollar earned.
 - Due to announced changes to Ontario’s social assistance program, unattached individuals on social assistance in 2020 are expected to see their EMTRs peak around 80 per cent at a lower level of earnings, between about \$9,000 to \$17,000 (which is more in line with where other jurisdictions are with respect to the claw-back rate on social assistance).
 - The presence of children also has a significant impact on EMTRs, especially for workers with low or modest income, reflecting the effect of income-tested children’s benefits. For instance, an unattached individual in Ontario generally faces EMTRs at or below 40 per cent at low- or moderate income levels. If that worker is a single parent with one child, this rate can rise to over 60 per cent, and with two or more children, rises to 80 per cent or more.
 - Being a secondary earner in a couple is another factor which contributes to higher EMTRs and PTRs, and thus disincentives to work, as they may face benefit claw-backs from their first dollar of earnings. This analysis focuses on secondary earners’ decision to join the workforce, and hence the focus is on PTRs.
 - Taking into consideration the cost of childcare, PTRs on returning to work full-time at the provincial minimum wage range from as low as about 40 per cent in British Columbia to over 70 per cent in Nunavut, with Quebec and Ontario around 55 per cent.

- 3 -

- Childcare costs are a key contributor to secondary earner PTRs in most provinces, but depend on the policy landscape (e.g., differences in income-tested subsidies and fee systems), as well as local supply and demand factors. While in Quebec childcare costs only account for about 15 per cent of the PTRs cited above, this rises to 25 per cent in British Columbia and about 40 per cent in Ontario, peaking at 50 per cent or more in the territories.
- Between 2014 and 2019, despite significant policy changes at the federal and provincial level in Ontario, the broad contours of EMTRs and PTRs have not shifted; rates remain high for certain demographics, such as low-income individuals on social assistance and families with children.
 - Key changes over this time period include the replacement of the Working Income Tax Benefit by the Canada Workers Benefit, and, at the Ontario level, the new Low-income Individuals and Families Tax (LIFT) credit and the Childcare Assistance and Relief from Expenses (CARE) tax credit.
 - For unattached individuals receiving the Canada Worker's Benefit in 2019, compared to Working Income Tax Benefit in 2014, EMTRs fell at low income levels but rose over the \$19,000 to \$24,000 earnings range.
 - For a single parent with one child, EMTRs remain highest around \$35,000 to \$45,000 in earnings, generally in the 50 – 60 per cent range.
 - As mentioned above, Ontario has announced (but not implemented) significant changes to their social assistance program that would impose higher claw-back rates on earnings for recipients who work.


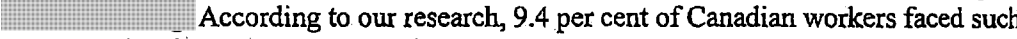
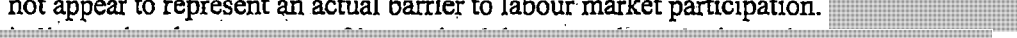



2. Distributional Analysis of Effective Marginal Tax Rates for Individuals

Background


- This paper discusses the distribution of EMTRs on labour income among workers aged 18 to 64. The analysis is based on survey data, and this is the first paper in Canada to present comprehensive distributional analysis of EMTRs accounting for the actual rates of benefits, income, and characteristics of individuals. This approach allows us to identify the actual number of workers facing high EMTRs in Canada, their characteristics, and the type of taxes and benefits that explain the high effective tax rates.

- 4 -

Main findings


- Overall, workers in Canada (19 million) faced an average EMTR of 34.1 per cent in 2017. In other words, they would have lost on average \$341 for an additional \$1,000 dollars earned in labour income because of the application of the federal and provincial tax and transfer systems. Interestingly, this rate is comparable to the 34 per cent median EMTR for U.S. households that the U.S. Department of Health & Human Services published in early 2019.
 - This average loss of \$341 is made up of additional federal personal income tax owed (\$146) and reductions in federal transfer payments (\$23), mainly the reduction in Canada Child Benefit (CCB) amounts. The remainder is composed of additional provincial income tax owed (\$99) and provincial transfer reductions (\$28), mainly social assistance claw-backs. Lastly, payroll taxes also played a role (\$48) in reducing net labour income.
- Given the progressivity of the tax and transfer systems, EMTRs varied by level of family income:
 - The average EMTR was the lowest (3 per cent) among workers with the lowest family income (first family income decile). This is attributable mainly to the impact of the federal tax and transfer system, in particular the Working Income Tax Benefit (WITB). For this group, the increase in taxes and decrease in provincial transfers resulting from additional earnings were almost entirely compensated by federal transfer benefits.
 - Workers with modest family income (third family income decile) had the highest average EMTR (41.3 per cent), followed by those in the top decile (40.2 per cent). However, the key reasons for the high average EMTR differed between these two groups. The reduction in transfer payments plays a major role in explaining high EMTRs for workers in modest-income families, whereas the rise in personal income taxes is the main factor for those in high-income families.
- 
 According to our research, 9.4 per cent of Canadian workers faced such a high EMTR in 2017. The proportion of workers facing a high EMTR was significantly higher among social assistance recipients (44.9 per cent) as well as families with children (19.1 per cent), especially lone-parent families with children (35.1 per cent).
- The results also show that the majority (58.8 per cent) of the Canadian workers facing EMTRs over 50 per cent already worked full-time and full-year in 2017. Hence, for a large share of workers facing high EMTRs, the burden of tax and transfer systems does not appear to represent an actual barrier to labour market participation. 





- 5 -

- While there is no single profile of workers facing high EMTRs, there are two notable groups among them:
 - The first and largest group (57 per cent of the 1.7 million high-EMTR workers) is made of workers facing EMTRs in the 50-60 per cent range for whom the PIT system largely explains the high EMTRs due to their significantly higher personal employment income. In this group, more than two thirds worked full-time and full-year in 2017.
 -  This group has an average personal employment income about four times lower than that of workers facing EMTRs in the 50-60 per cent range (\$25,600 versus \$99,600), and includes a smaller proportion of full-time, full-year workers. For this group, the impact of phasing out government transfers is much more significant, especially the impact of social assistance claw-backs. Among federal transfers, the CCB reduction contributes the most to offsetting the benefits of earning more. Nevertheless, the CCB offsetting impact is not as significant as the offsetting impacts arising from additional federal and payroll taxes.

Key takeaways

- These papers illustrate the complex interaction of tax and benefit systems, both at the federal and provincial levels, which combine to create strong disincentives to work for some Canadians. The findings highlight the importance of taking a system-wide perspective when considering adjustments to income-tested programs.
- Financial barriers to work for Canadians receiving social assistance are well known. These papers show that earnings supplements, such as the Canada Workers Benefit, make an important contribution to increasing incentives to work at low levels of earnings – both by increasing incentives to move off social assistance and by providing an alternative, pro-work form of income support for those not on social assistance.

• 

• 

Update on Effective Marginal Tax Rates and Participation Tax Rates for Individuals

Individual work decisions reflect a complex interplay of personal, social, and financial factors. This paper examines the impact of the tax and benefit system, which often imposes an unintended distortion on individuals' choices. The tax system affects individuals' behaviour, in particular their labour supply, by altering the financial returns they face on choices, such as increased work effort or investment in skills.

Labour supply may adjust at both the intensive and extensive margins:

- The intensive margin refers to a small change in the supply of labour by a worker already in the labour force, and incentives at this margin are best captured by effective marginal tax rates (EMTRs). An individual's EMTR is the percentage of an extra unit of income, such as from a salary increase or additional hours worked, that the individual will give up in taxes or in reduced benefits.
- The extensive margin refers to a decision to enter or exit the labour market, and incentives here are captured by participation tax rates (PTRs). PTRs indicate the percentage of an individual's total earnings that will be lost to taxes and reduced benefits upon entering the workforce at a particular earnings level.

Both EMTRs and PTRs are important determinants of aggregate labour supply, and this paper considers both metrics in the context of working age¹ adults in Canada, with a focus on Ontario in many of the examples. Empirical work suggests that low-income individuals are generally more responsive to incentives affecting labour supply decisions made at the extensive margin (many workers are not in a position to negotiate the number of hours, weeks or months they work in the year.)

EMTRs and PTRs are a product of the interaction of a variety of tax and benefit programs and can vary widely depending on individual and family characteristics, and province or territory of residence. Some of the most adverse impacts of EMTRs and PTRs can be seen in "poverty traps" which may be produced unintentionally by the tax and transfer system. While provincial and territorial measures related to social assistance generally aim to improve welfare for the most vulnerable, these measures can significantly increase EMTRs and PTRs because assistance is phased out as incomes increase.² Where EMTRs or PTRs are very high, or eligibility for other benefits such as subsidized housing may be lost due to a marginal increase in earnings levels, individuals (or their families) may see very little gain from working more hours or joining the workforce, or can even be made worse off. This often occurs at relatively low levels of income. Poverty reduction strategies therefore often seek to reduce EMTRs and PTRs and make work more rewarding.

¹ This paper does not include analysis of work incentives faced by elderly individuals. Extensive recent work has been done on this subject in the context of Budget 2019, which implemented a full or partial exemption on up to \$15,000 of earned income for GIS recipients.

² Some of these measures and their impacts will be discussed under the "Comparison with 2014" section regarding recent changes in EMTRs and PTRs.

Families with children with moderate incomes may also see high EMTRs due to the claw-back of federal and provincial children's benefits. In particular, secondary earners—members of a couple with lower labour force earnings (or no earnings) than their partners—tend to face higher EMTRs and PTRs at low levels of individual earnings than a primary earner would face at those levels. Secondary earners in a couple are more likely to be women, who earn less on average than men.³

Many benefits and tax credits are tested against family income, such that a secondary earner may be subject to the claw-back of benefits or credits from their first dollar of earnings because their partner's earnings are already sufficient to exceed the claw-back threshold. Moreover, because the spousal or common-law partner amount available to a primary earner will start being reduced as soon as the secondary earner begins earning income, the family is effectively taxable on the secondary earner's first dollar.

Tax policy can influence labour supply decisions through both income effects and substitution effects. A policy that makes work more rewarding (e.g., by reducing EMTRs) may have a substitution effect whereby individuals increase their labour supply because the opportunity cost (or "price") of leisure has increased. However, if this policy also raises an individual's after-tax income, it may have an income effect whereby this individual uses her increased purchasing power to increase her consumption of leisure, leading to a decreased labour supply. A change in EMTRs will typically have both of these types of effects operating in opposing directions.

The relative importance of the income and substitution effects, themselves informed by a range of other personal preferences and characteristics, will make different taxpayers more or less responsive on net to a change in these financial incentives. A sole earner supporting a spouse and children may not be very responsive to changes in their EMTR because they need to earn enough to support their family. Conversely, the labour supply decisions of certain groups, such as secondary earners with children and single parents, are often found to be relatively sensitive to incentives offered by the tax and transfer system. These groups often have child care obligations and may receive monetary support from a spouse or through the tax and transfer system.⁴

This note presents an update on EMTRs and PTRs in Canada, and how these have changed since 2014. Since 2014, governments in Canada have undertaken a range of measures that have affected EMTRs for individuals and families, which will be described in greater detail later in this piece.

Methodology

This paper presents results for "typical" Canadians. These typical individuals are working-aged, and it is assumed that their market income is composed solely of employment income. It is further assumed that they make no savings in the year aside from those mandated under the Canada Pension Plan. Taxes and benefits of general application that these typical individuals would face at both the federal and provincial/territorial levels are modelled based on their

³ 2016 Statistics Canada data indicates that among married or common-law couples, in about 32 per cent of cases men and women earned roughly equal incomes (each earning between 40 and 60 per cent of household income) and in roughly 17.5 per cent of cases women earned more.

⁴ Meghir, C. and D. Philips, *Labour Supply and Taxes*, in Stuart Adams et al. (Eds) *Dimensions of Tax Design: The Mirrlees Review*.

assigned incomes and family characteristics. Once tax payable, Employment Insurance premiums, Canada Pension Plan contributions, and benefits⁵ have been calculated, EMTRs and PTRs are derived by comparing the remaining disposable income of these typical individuals at different levels of earnings.⁶

Because the results are not based on nationally representative survey data or on data taken from a census, they are not generalizable to the Canadian population, and it is not possible to analyse distributional aspects of tax policy using this data or to produce descriptive statistics. Instead, the use of typical individuals allows for control over the characteristics and circumstances of the case being considered in the analysis, and as such, allows for the consideration of how a given policy could influence individuals whose characteristics and circumstances match those being modeled. A separate but related paper being produced by Tax Policy Branch will examine the distribution of EMTRs⁷ among working-age individuals using survey data (i.e., the Statistics Canada's Social Policy Simulation Database and Model (SPSD/M)). This complementary analysis will identify the actual number of workers facing high EMTRs in Canada, their characteristics, and the types of federal and provincial taxes and benefits that are at play.

As mentioned in the introduction, secondary earners tend to be particularly responsive to changes in PTRs. When considering the PTRs facing secondary earners, the typical individuals presented below will show estimated PTRs associated with the tax and benefit system, as well PTRs that account for child care expenses. When the secondary earner in a couple with young children joins the labour force, the additional child care costs that the family must incur as a result of this increased labour supply reduces the family's disposable income, introducing an additional financial disincentive to work. Including child care costs in this analysis will highlight the impact that these costs have on work incentives.

The calculation of PTRs including child care expenses required estimates of these expenses for typical families. These estimated expenses were obtained using Statistics Canada's Survey on Early Learning and Child Care Arrangements (SELCCA, 2019). With the exception of Quebec, the estimated part-time and full-time child care expenses used were the median annualized child care expenses incurred by families under their primary child care arrangement.⁸ The calculation of PTRs of secondary earners also required assumptions about the primary earner income and the earnings that the secondary earner could obtain upon joining the labour market. In this analysis, unless otherwise stated, it was assumed that the primary earner had annual earnings of \$50,000 (the median total income of a family of three with a single earner and one child under the age of 6 in Canada according to the 2016 Census), and that the secondary earner would earn the provincial or territorial minimum wage.⁹ The PTR associated

⁵ Benefits are calculated based on income earned in the relevant tax year being analysed, but may be paid out at a future date, based on the benefit's delivery model. Benefit amounts are not discounted to account for inflation or individual preferences regarding the timing of payments.

⁶ This analysis makes use of \$1,000 increments in earnings to measure EMTRs. Assumed earnings upon entering the work force are as described in the body of the analysis that follows. CPP contributions and EI premiums are included in EMTRs notwithstanding the associated increase in potential future benefits to contributors. To the extent that contributors perceive a strong link between these payments and future benefits, the payments are less likely to affect labour supply decisions.

⁷ An analysis of the distribution of actual PTRs will be included in future research.

⁸ The unit of analysis for SELCCA is the child.

⁹ There is some evidence to suggest that secondary earners who stay at home have, on average, lower levels of educational attainment and therefore face lower-wage options than the primary earner in a couple. A Statistics Canada study based on 2015 Labour Force Survey data found that in 2015, 38 per

with joining the workforce on a full-time basis was thus the earnings that an individual could expect to receive from working 37.5 hours per week for 50 weeks out of the year in their province or territory. Part-time PTRs were similarly obtained using a 22-hour workweek (roughly three full shifts per week).

Annex A presents further assumptions used in the production of secondary earner PTRs, including tables that contain the main child care cost and secondary earner assumptions used in this paper.

Limitations

Certain benefits are omitted from this analysis. For example, Quebec's Tax Shield is a refundable tax credit intended to offset associated decreases in certain other tax credits when working income increases on a year-over-year basis. This effect is temporary; the full decrease in these other credits would be reflected in the second year following the increase in working income. Given the temporary nature of the offset and the complexity of the measure's design, it is omitted from the analysis in this paper.

Moreover, the EMTRs and PTRs estimated in this paper are based only on measures that apply to the general working-aged population of Canada, and exclude many benefits that are targeted to particular groups of individuals. Thus, the fiscal disincentives faced by particular individuals may be higher than estimated, depending on how many of these excluded programs the individual is eligible for and intends to use. Such benefits commonly fall in the areas of support for housing, education, and health care.

Housing: Numerous housing programs for low-income individuals and families in Canada—including programs that subsidize rent, cash housing benefits, and renovation subsidies—feature an income test and, as such, have implications for individual work incentives. Take-up of these programs is often low. For subsidized rent programs, there is usually excess demand, and individuals are often on waiting lists for some time before being granted housing. Nonetheless, this kind of housing program may have a very large impact on an individual's work incentives; rent-geared-to-income, a common kind of subsidized housing that limits rent to a fixed share of income, typically raises EMTRs by 25 to 30 percentage points. In contrast to subsidized rent, cash housing benefits do not have the same type of supply constraint because they are not tied to a particular housing unit. However, they may have supply constraints due to being funded through a fixed budget. Moreover, they may in some cases have very low take-up, or be targeted to particularly vulnerable households, such as Ontario's Portable Housing Benefit, which is targeted specifically to survivors of domestic violence and their families. For these reasons, cash housing benefits, aside from those that are a component of social assistance programs, are also not included in the analysis.

Education: Education and training programs could also have an impact on work incentives above and beyond what is reported using typicals. Perhaps the biggest of these is the Canada Student Grants program, which offers income-tested, non-repayable grants to individuals who pursue college or university. Under this program, when an individual's household income rises above a given threshold, grant amounts are gradually reduced. As with other income-tested

cent of stay-at-home mothers had a high school diploma or less, compared to 27 per cent of single-earner mothers and 19 per cent of dual earner mothers. Additionally, 42 per cent of stay-at-home fathers had a high school diploma or less, versus 31 per cent of single-earner fathers and 25 per cent of dual earner fathers.

programs, this program may introduce disincentives to work for those with a family member intending to make use of the grants. Other education-related programs also exist to help individuals save for their child's postsecondary education (e.g., through a Registered Education Savings Plan) and tie financial support to income, but these generally have a smaller impact on work incentives. Similarly, the new Canada Training Credit introduces both a work incentive and disincentive depending on where an individual finds themselves on the income distribution, though these are also relatively small.

Health care: Another group of programs that are not included in the calculation of typical EMTRs and PTRs which could nonetheless influence work decisions includes targeted health care programs. These programs typically seek to offset the costs of health care products or services not otherwise covered by the health care system (e.g., prescription drug coverage), and normally target coverage based on income. It is difficult to quantify the impact of these programs on an individual's EMTRs or PTRs because benefit entitlements are delivered in-kind and when needed. Furthermore, each individual's perception of the value of these benefits could be different, and it is ultimately the perceived value of the benefit that would impact work decisions. For these reasons, these are not included in EMTR or PTR calculations.

A more detailed explanation of these types of programs, along with specific examples, is provided in Annex B.

Results

The results presented in this section describe EMTRs faced by individuals in different family types in several stylized examples. For simplicity, the charts below generally focus on Ontario, the most populous province, but results tend to be qualitatively similar across the country. Other provinces or territories where results are particularly notable are also discussed below, and additional charts can be found in Annex C.

Unattached individuals on and off social assistance

To set a baseline, consider the EMTRs facing an unattached individual (single, with no children) as shown in Chart 1, both on and off social assistance. Low-income workers are not subject to tax if they earn less than the basic personal amount (\$12,069 in 2019 for the federal government)¹⁰ and are otherwise taxed at relatively low or even negative rates. However, social assistance has a strong effect on EMTRs for recipients, as it is clawed back at a steep rate as incomes increase.

Chart 1 shows that in Ontario, in 2019, an unattached individual receiving social assistance benefits will face high EMTRs over most of the earnings range below about \$24,000.¹¹ These rates are as much as 50 percentage points higher than an individual who does not receive social assistance over the same earnings range in 2019.

¹⁰ Individuals with employment income would also receive the Canada Employment Credit on \$1,222 of earnings in 2019, and both employees and self-employed workers would receive a tax credit on their CPP and potentially EI contributions.

¹¹ This analysis implicitly assumes that social assistance is calculated on an annual basis. However, social assistance is normally administered on a monthly schedule, and an individual could work part of a year, then go on social assistance, and then return to work all within the same year. Such an individual could face quite different incentives to work at different points in the year. These charts serve to illustrate work incentives facing low-income individuals who are on social assistance over an extended time period.

Chart 1: EMTRs of an unattached individual in Ontario, on and off social assistance

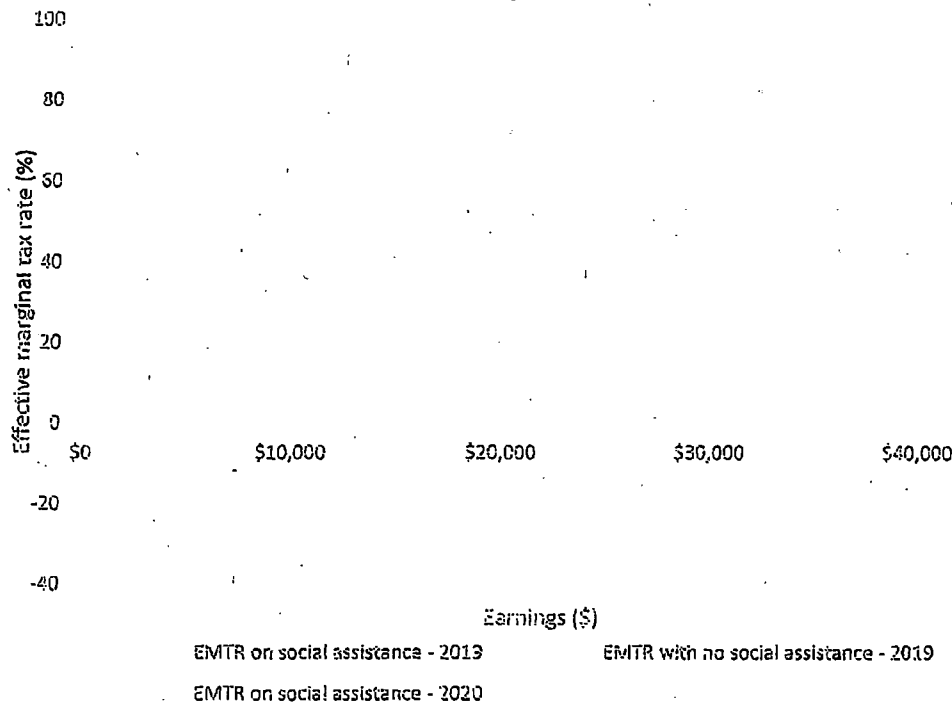


Chart 1 also shows EMTRs for an unattached worker on social assistance in Ontario in 2020:

- The Government of Ontario has announced that it will be raising the rate at which social assistance is clawed back from 50 per cent to 75 per cent, leading to significantly higher EMTRs over earnings ranging from \$3,000 to \$17,000.¹² EMTRs will rise to 80 per cent over incomes from \$9,000 to \$17,000.
- The faster phase-out of social assistance implicitly also reduces the income range over which an individual can receive it, such that the reform ends up lowering EMTRs over earnings ranging from \$17,000 to \$24,000. This highlights an important trade-off for a program with a given entitlement amount; while a reduced claw back improves work incentives for those on the program, it may also cause the claw-back to reach higher up the income scale and potentially apply to a larger number of people.

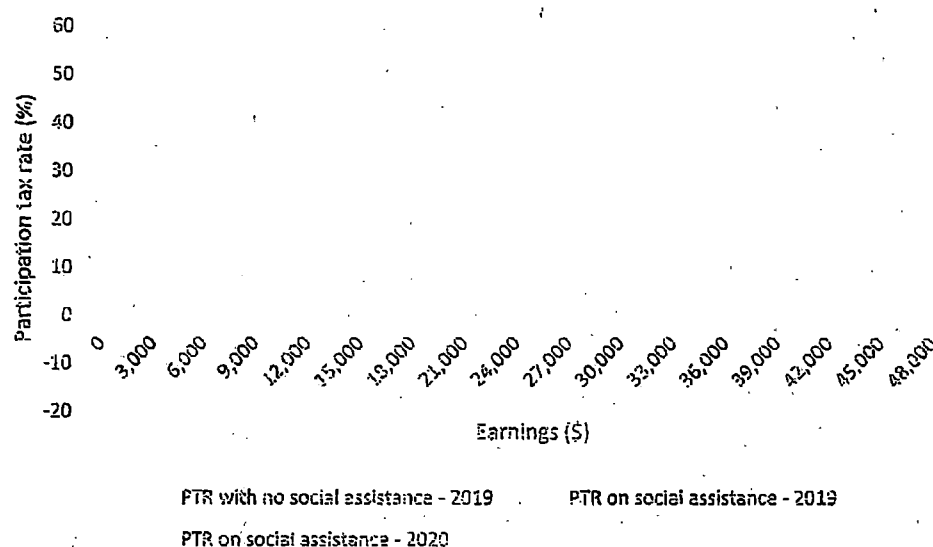
The effects of the Canada Workers' Benefit (CWB), and similar provincial programs like the Quebec Work Premium, are also visible in Chart 1. The CWB phases in with each dollar of earned income over \$3,000, up to a maximum credit of \$1,355 for single individuals without children and \$2,335 for families (in 2019). However, the phase-out of the CWB contributes to increasing EMTRs as it is subsequently clawed back on adjusted net income over \$12,820 for single individuals, and \$17,025 for families. For an unattached individual as described in Chart 1, this benefit would be phased-out completely by around \$24,000 in earnings.

¹² Ontario has not announced the implementation date of these reforms. For illustrative purposes, we assume that they will take effect as of January 1, 2020 (so the 2019 lines in Charts 1 and 2 represent the current system and the 2020 lines represent the new system).

These programs increase the financial returns to work and thus reduce the high EMTRs faced by workers on social assistance, and even create negative EMTRs at very low levels of earnings for many lower-wage workers not on social assistance. In optimal tax theory, negative EMTRs at very low levels of earnings may be justified where workers are strongly responsive on the extensive margin, relative to the intensive margin.¹³

The results in Chart 1 hold across most provinces. In Quebec, unattached individuals on social assistance face even higher EMTRs relative to those not on social assistance; between \$5,000 to \$10,000 in income, those on social assistance face EMTRs of roughly 70 per cent, compared to roughly -20 per cent for those not on social assistance (Chart C1 in Annex C). British Columbia sees similarly large differences in the EMTRs of those on or off social assistance up to earnings of roughly \$15,000 (Chart C2), and in Alberta, a lesser but still significant gap persists up to the same point (Chart C3). That said, EMTRs for recipients of social assistance generally remain below 100 per cent, and as a result the individual will still see their total disposable income increase if they increase their work effort.

Chart 2: PTRs of an unattached individual in Ontario, on and off social assistance (2019)



While Charts 1 and 2 show the extent to which social assistance can potentially impact individual EMTRs and PTRs, social assistance is typically administered as a program of last resort, and administrators would in most cases try to ensure that recipients are actively working towards getting off of social assistance. For example, Ontario Works requires that applicants sign a Participation Agreement, through which the applicant, their spouse, and any adult dependent agree to undertake approved employment assistance activities in order to prepare for, find and maintain employment.¹⁴ This Participation Agreement is then periodically reviewed to ensure that applicants are on track towards finding employment.

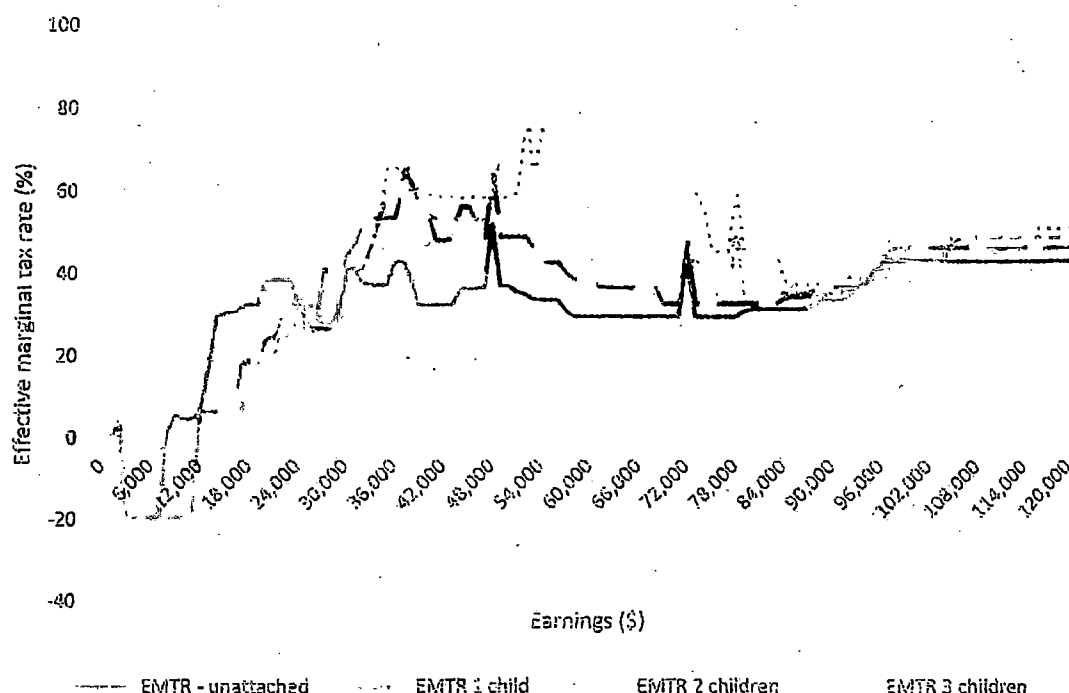
¹³ Saez, Emmanuel. "Optimal income transfer programs: intensive versus extensive labor supply responses." *The Quarterly Journal of Economics* 117.3 (2002): 1039-1073.

¹⁴ Social assistance programs often make exceptions to their work requirements depending on individual circumstances. For example, Ontario Works does not require mothers caring for an infant to engage in

Single parents

For workers of modest or middle income, the presence of children is an important factor affecting EMTRs. Chart 3 compares estimated EMTRs for a single (unattached) individual and single parents with one, two or three children in Ontario.¹⁵

Chart 3: EMTRs of individuals with one, two, or three children compared to an unattached individual in Ontario, (2019)



While the single parent faces lower EMTRs than an unattached individual at very low levels of earnings (as they can claim the spousal amount in respect of their first child), beyond roughly \$25,000 in earnings the single parent will face higher rates, and this gap generally widens as the number of children in a household increases. Relative to unattached individuals, the EMTRs of single parents are highest when they have more than one child and fall in the earnings range of roughly \$50,000 to \$65,000. For a single parent with three children, at around \$55,000 in earnings they can face EMTRs of about 80 per cent while an unattached individual with the same amount of income would have an EMTR under 35 per cent.

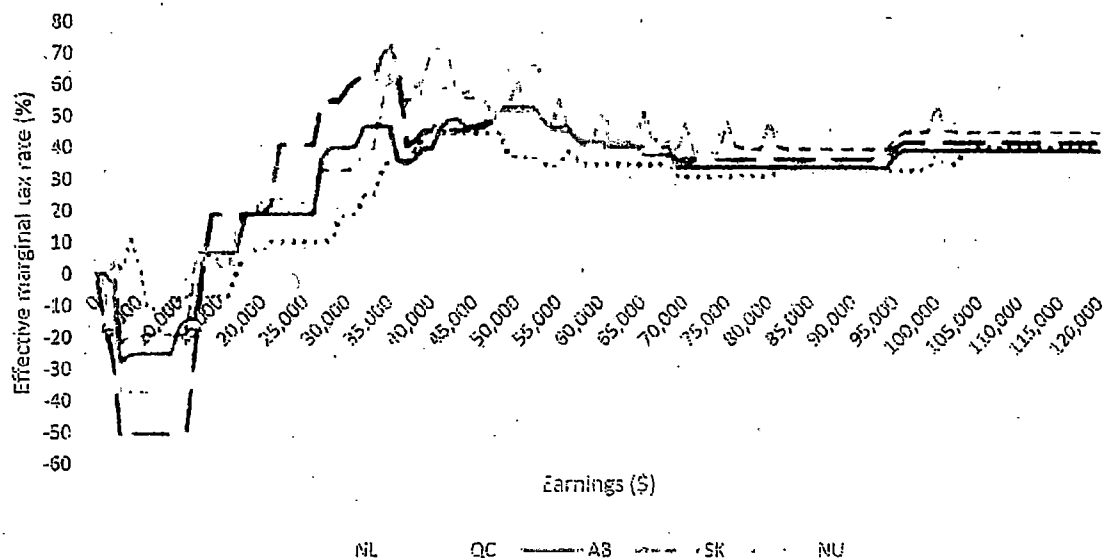
employment activities. Often provinces also have a separate social assistance stream for those with a disability.

¹⁵ The chart shows a single parent with one child under the age of six, two children where one is under six and one over six, and three children where two are under six and one is older. These results will vary depending on the ages of the children in question. Larger benefit amounts are frequently available in respect of very young children (i.e. under the age of six) and this can in turn impact EMTRs.

This pattern is primarily driven by children's benefits and their claw back. The federal Canada Child Benefit (CCB), available to individuals or families with one or more children, is a relatively generous benefit that begins to phase out where adjusted family net income¹⁶ is more than about \$32,000. In addition to the CCB, provincial child benefits are also often phased out over this range. PEI and Saskatchewan are the only jurisdictions without a dedicated provincial child benefit, and the design of programs across other provinces varies widely. The Ontario Child Benefit, for example, starts being phased out at income over about \$22,000 at a rate of 8 per cent, while Quebec has multiple benefit programs that provide amounts based on income level and number of children, such as the Family Allowance Payment and the Work Premium. These phase-out rates stack, and can add significantly to work disincentives.

As a result of these variations in policy, EMTRs for single parents differ across jurisdictions but the general pattern is similar. Chart 4 was constructed to provide examples of differing EMTR profiles, and includes Newfoundland and Labrador, Alberta, Quebec, Saskatchewan and Nunavut.¹⁷ As shown below, EMTRs in those provinces show a significant increase around \$30,000 in earnings and do not decline again until roughly \$50,000 in earnings. EMTRs are generally lower in Alberta, with EMTRs for single parents peaking at about 50 per cent around \$50,000 in earnings, while Nunavut has even lower EMTRs over most of the \$15,000 to \$80,000 earnings range. EMTRs in the other territories are somewhat similar, if not quite as low as in Nunavut, and are not shown in the charts. On the other hand, EMTRs in Quebec are frequently higher than in Ontario, remaining around 60 per cent from \$25,000 to about 55 per cent in earnings. Results for other provinces tend to lie between Ontario and Alberta, with the exception of Newfoundland and Saskatchewan, where EMTRs can rise to over 70 per cent, and the low EMTRs in Nunavut (and to some extent, the Yukon and Northwest Territories).

Chart 4: EMTRs for single parents with one child under 6 in Newfoundland and Labrador, Quebec, Alberta, Saskatchewan and Nunavut (2019)



¹⁶ Adjusted family net income is family net income minus any Universal Child Care Benefit and Registered Disability Savings Plan income, plus any such amounts repaid.

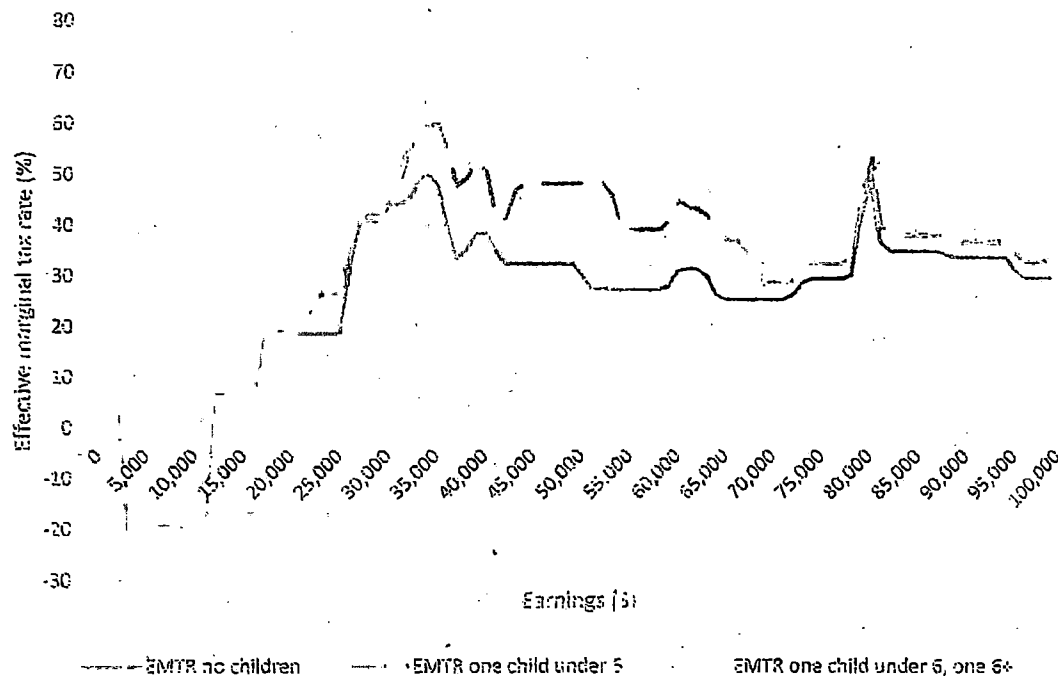
¹⁷ EMTRs for other jurisdictions can be found in Chart C4 in Annex C.

As is the case for unattached individuals not on social assistance, most jurisdictions exhibit negative EMTRs for single parents at low levels of earnings.

Primary earners in families with children

The general pattern of EMTRs for primary earners in families with children is similar to that for single parents, increasing with the number of children. The thresholds at which a primary earner is subject to the phase-out of benefits will depend on the amount earned by his or her partner. The example in Chart 5 shows a two-earner couple in Ontario and assumes that one parent earns 40 per cent of household income while the other earns 60 per cent.¹⁸

Chart 5: EMTRs for individuals in two-earner families in Ontario with no children, one child or two children (2019)



In this example, EMTRs rise fairly rapidly from roughly \$15,000 to \$35,000 in family income, the trend exaggerated with each additional child. A couple with no children and income around \$35,000 faces an EMTR of about 50 per cent. With one child under the age of 6, this is closer to 60 per cent, and with a second child over 6, the EMTR is nearly 70 per cent. For a given family income, single parents generally face higher EMTRs than primary earners in two-earner couples, all other things being equal, due to progressivity and the individual-based tax system.

¹⁸ EMTRs for two-earner families are calculated assuming that increased earnings accrue to the primary earner, and therefore reflect the change in the family's effective tax rates based on that individual's change in earnings.

Secondary Earners

In this section we consider secondary earners – i.e. non-working spouses who are considering entering the workforce, or lower-earning spouses who might consider leaving the workforce. As mentioned in the introduction, secondary earners often face significant disincentives to work due to several features of the tax and benefit system. Because a secondary earner may effectively transfer their Basic Personal Amount to the primary earner in the couple (through the spouse or common-law partner amount), the secondary earner's income is effectively taxable from the first dollar they earn. Moreover, since benefits are often calculated and clawed back based on family income, the first dollar of income the secondary earner brings home often serves to reduce benefits the family would otherwise receive.

In addition to the disincentives presented by the tax and benefit system, secondary earners with children may face disincentives to joining the labour force due to child care costs. Secondary earners who choose to join the workforce would often be required to pay for child care services, which could be costly and/or difficult to find.¹⁹ Evidence from Quebec and other OECD countries shows that the provision of low-fee childcare raises women's labour force participation,^{20,21} and some studies suggest that across Canadian cities, higher child care costs may be associated with larger gender employment gaps.²² As shown below, this added cost to the family, when combined with the disincentives presented by the tax and benefit system, may make the secondary earner's labour force participation a financially unattractive option for some families.

- While child care costs are not a non-neutrality introduced by the tax and benefit system (and are not strictly speaking part of PTRs), they are included in the total PTR for the purpose of the calculations below:

[REDACTED]

There are many circumstances that can vary the degree to which each of the above mentioned factors influences a secondary earner's work incentives. For example:

- Those with higher potential earnings would likely not be as adversely affected by child care costs, these costs representing a significantly smaller proportion of their potential labour market earnings;
- Those with a higher earning spouse would likely have smaller PTRs as their high-earning partner's income would have largely phased out a larger share of benefits (see Chart C5);

¹⁹ According to the Statistics Canada 2018 paper, "Early learning and child care for children aged 0 to 5 years: A provincial and territorial portrait", 36 per cent of parents or guardians who had a child in child care reported difficulties in finding formal or informal child care arrangements, with variations across provinces.

²⁰ See, for example: Lefebvre, P. and Merrigan, P. (2008). Child-Care Policy and the Labor Supply of Mothers with Young Children: A Natural Experiment from Canada. *Journal of Labor Economics*, 26(3), 519-548. For a more complete analysis on this subject, refer to 2019FIN489256.

²¹ Analysis of the net budgetary impact of universal low-fee childcare in Quebec suggests that increased tax revenues from higher female labour supply fall short of the cost of the subsidies (2019FIN489256).

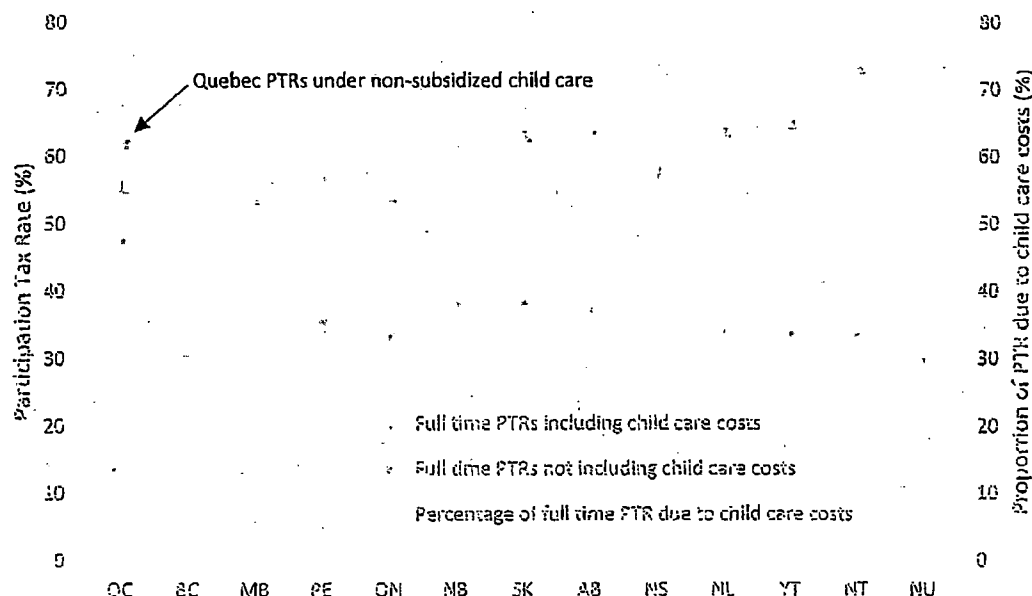
²² Moyser, M. (2017). Women and Paid Work. In *Women in Canada: A Gender-based Statistical Report*. Statistics Canada.

- Those with more children would face both higher child care costs, and potentially a higher phase-out rate from benefits like the CCB;
- Those living in different provinces may face different provincial policies; subsidized child care, for example, would reduce the impact of child care costs on work incentives, while more generous provincial benefits could present secondary earners with a larger total phase-out rate of benefits.

Much of the analysis below will involve considering the PTRs of secondary earners under varying hypothetical scenarios. The baseline case being considered will be that of a secondary earner working full-time (37.5 hours per week, 50 weeks per year) at the provincial minimum wage²³ with a primary earner earning \$50,000 per year²⁴ and with a single child under the age of six. In this section, PTRs will include child care costs net of any provincial child care benefits or subsidies, unless stated otherwise.

Chart 6 presents this baseline case in each of the provinces and territories with and without child care costs. Provinces in this chart are ranked in increasing order of the proportion of PTRs attributable to child care costs in order to highlight the relative impact of these costs on the total financial disincentives facing secondary earners (see Chart C6 for PTRs of part-time work). Note that the results in Chart 6, and in the remainder of this section, should be viewed as illustrative of the experience that may be faced by a typical family as described above, but should not be read as broadly reflective of all Canadian families in a particular jurisdiction.

Chart 6: PTRs for secondary earners across Canada with and without child care costs associated with the full-time care of one child, and the proportion of PTRs attributed to child care costs (2019)



²³ See Table A2 of Annex A for a list of these annual earnings.

²⁴ This value aligns with the national median total income of a family of three with a single earner and one child below the age of six, as reported in the 2016 Census of Population. Using the provincial or territorial medians does not qualitatively alter results.

The need to pay for child care roughly doubles estimated PTRs for a secondary earner in Newfoundland and Labrador and the territories. This contrasts sharply with Quebec, British Columbia and Manitoba, where child care makes up no more than 30 per cent of a secondary earner's PTR. The remaining provinces all have child care costs that contribute approximately 40 per cent of total PTRs in the modeled scenarios.

Quebec, Manitoba and PEI differ from other jurisdictions in that they set province-wide fees in some or most of their regulated child care centres, and provide operational funding to keep fees lower than market rates.²⁵ While median child care costs across Canada for full-time daycare for one child were estimated around \$7,000 per year, Ontario, British Columbia, the Northwest Territories and Nunavut, as well as non-subsidized child care in Quebec, all have annual full-time child care costs in excess of \$10,000 per year.

Despite high fees, the impact of child care on PTRs in Ontario and British Columbia is moderated by child care policies in these provinces that provide funding directly to families. In Ontario, this funding comes through the Childcare Access and Relief from Expenses (CARE) tax credit, which will be discussed when comparing 2014 and 2019 EMTRs, and in British Columbia, this aid comes through the Affordable Child Care Benefit, which is a child care subsidy paid directly to families.

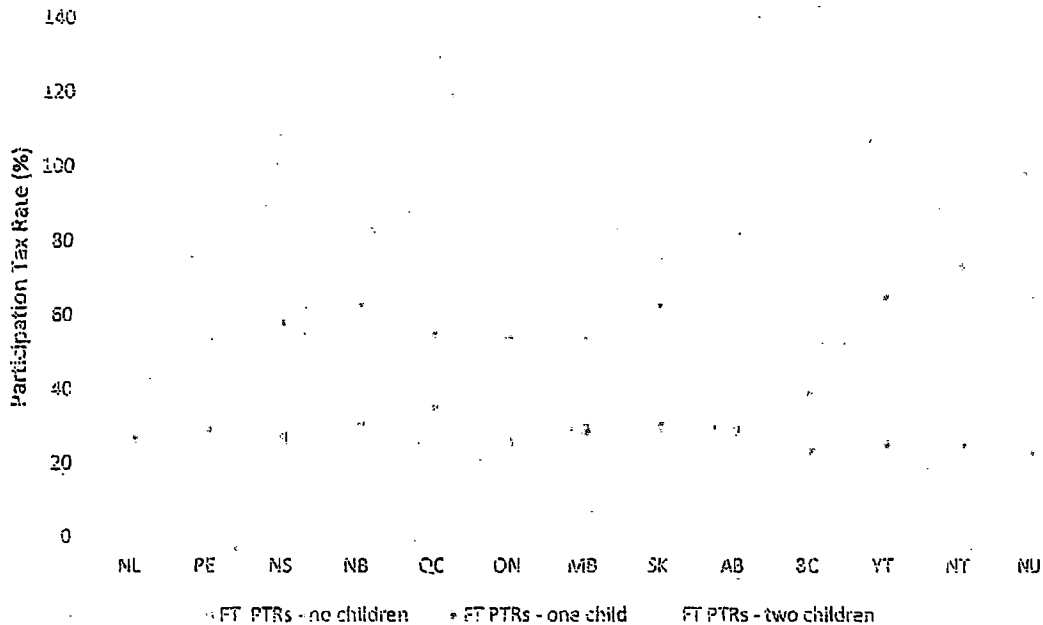
The remaining provinces and territories typically also provide targeted child care subsidies paid to providers on behalf of low- or modest-income households, but these subsidies have generally phased out completely by about \$70,000 of annual family income, an income level lower than the one modelled here. In contrast, British Columbia and Ontario child care policies are fully phased out at incomes of \$110,000 and \$150,000, respectively.²⁶

As mentioned with respect to single parents, the number of children in a family further influences the work incentives facing the household's secondary earner. For this illustrative family, having two children actually raises the secondary earner's PTRs to over 100 per cent in Newfoundland and Labrador, and the territories (Chart 7). This means that the total of the combined taxes, claw back of benefits, and child care costs faced by the secondary earner in these regions is more than what they would earn if they joined the labour market on a full-time basis earning minimum wage.

²⁵ "Early Childhood Education and Care in Canada 2016". *The Childcare Resource and Research Unit* (2018).

²⁶ The more gradual phase-out of child care funding in these provinces that makes these benefits reach higher up the income distribution leads to an interesting result that can be seen in Chart C5 of Annex C. The phase-out of child care subsidies raises PTRs for secondary earners with a higher income spouse to be above those of secondary earners with a lower income spouse – a result contrary to what is seen in other provinces and territories.

Chart 7: PTRs for secondary earners across Canada with no children, one child, or two children (2019)



In other provinces, the PTR modelled for a secondary earner with two children under the age of six is typically between 80 and 100 per cent. Only three provinces show PTRs below 80 per cent for a secondary earner with two children: namely, Quebec, Manitoba and British Columbia. The secondary earner in British Columbia with two children has a PTR of only 54 per cent — lower than that of a secondary earner with one child in most other provinces and territories. While the incremental impact of each child on PTRs is similar in Quebec as it is in British Columbia, Quebec features the highest PTR for secondary earners with no children, making PTRs for secondary earners with two children reach 70 per cent. The other two provinces that regulate rates charged by child care centres, namely, Prince Edward Island and Manitoba, also have lower PTRs for secondary earners with two children, with these hovering around 80 per cent.

Comparison with 2014

In this section we compare 2014 and 2019 EMTRs for residents of Ontario to provide a sense of how policy innovations over the period have affected this landscape. Over this period the federal government has made a number of significant policy changes such as introducing the CCB (replacing the Universal Child Care Benefit and the Canada Child Tax Benefit) and the Canada Worker's Benefit (replacing the Working Income Tax Benefit), and implementing the Middle Class Tax Cut. Meanwhile, the Government of Ontario has implemented significant new measures such as the Low-income Individuals and Families Tax (LIFT) credit and the Childcare Assistance and Relief from Expenses (CARE) tax credit.

Chart 8: EMTRs for a single parent with one child in Ontario 2019 vs 2014

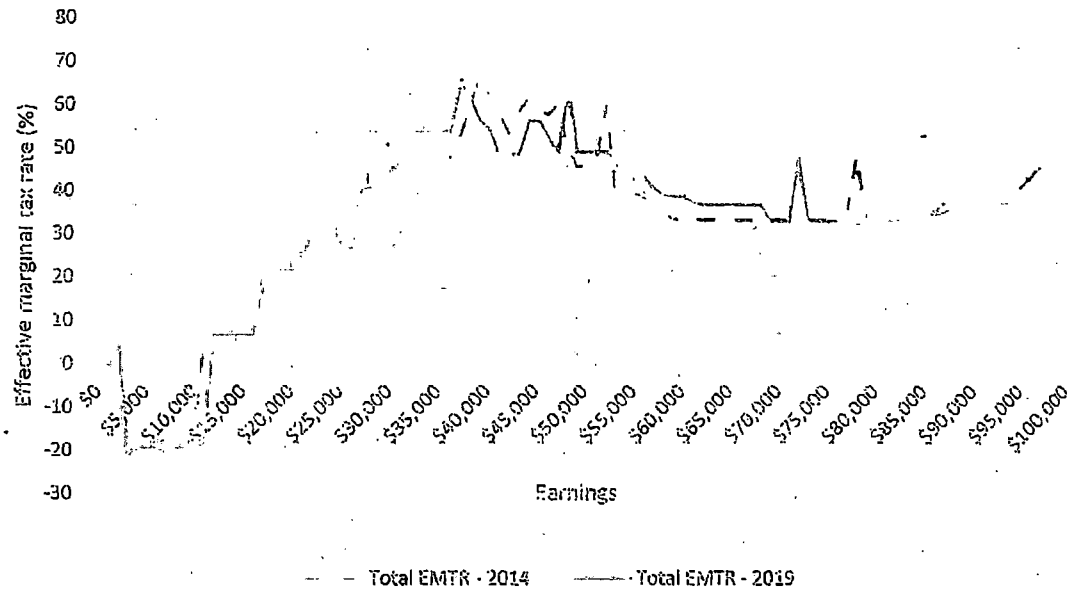
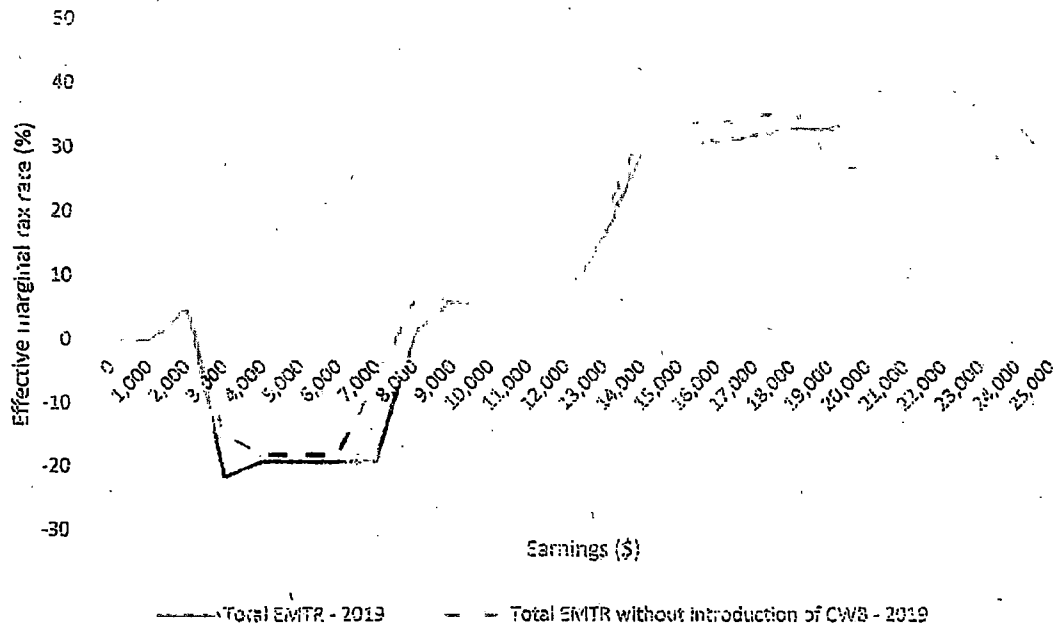


Chart 8 shows the total change in Ontario EMTRs between 2014 and 2019 for a single parent with one child, with 2014 tax system parameters adjusted to strip out the effects of indexation. The effects of some significant tax policy changes, such as the Middle Class Tax Cut, are difficult to spot. In contrast, one of the clearest visual changes in the EMTR pattern from 2014 – a series of small “spikes” that appear to shift down the earnings distribution – is caused not by a marquee government policy but rather by the non-indexation of Ontario Health Premium income thresholds. Altogether these changes have had differing impacts depending on individuals’ circumstances, and so the following charts examine a variety of family compositions and decompose the effects of the aforementioned policy changes.

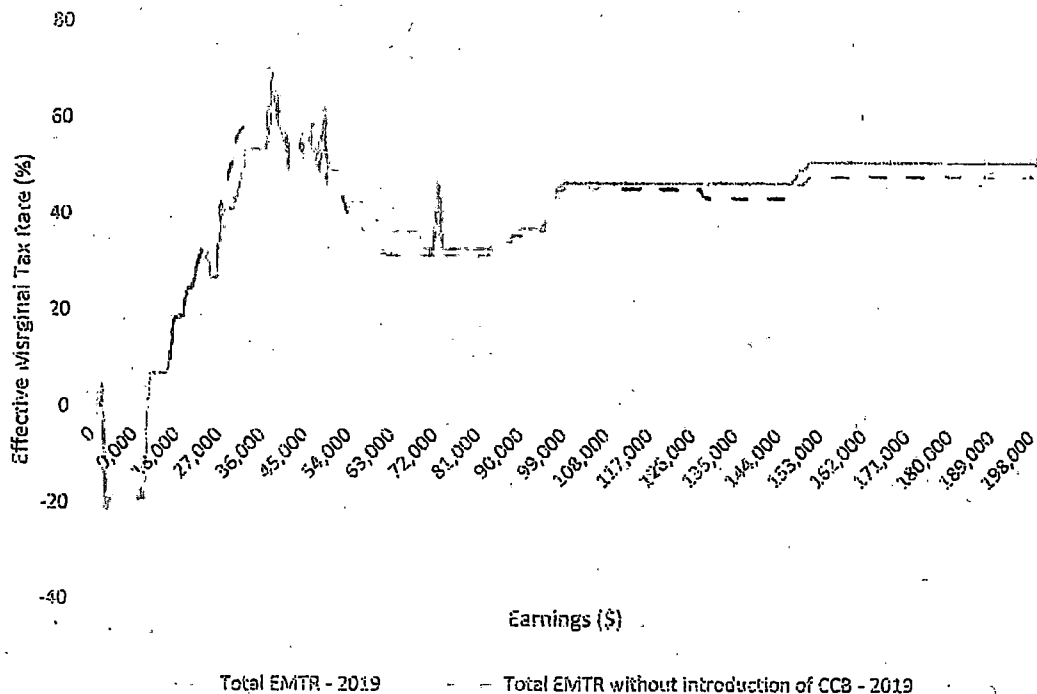
Chart 9: EMTRs for an unattached individual in Ontario with the Canada Worker's Benefit or with the former WITB (2019)



To examine the effects of individual tax policy measures it is useful to focus in on certain ranges of the income distribution, as in Chart 9 for the Canada Worker's Benefit (CWB). The CWB is an enhanced version of the former Working Income Tax Benefit (WITB). Introduced in Budget 2018, the CWB increased the maximum benefit that low-income workers can receive and increased the income threshold at which the benefit begins to phase-out. Chart 9 shows Ontario EMTRs in 2019 and a counterfactual scenario where the WITB was in place in that year. The difference between the two lines shows the impact of the policy change.

Relative to EMTRs under the former WITB, the enhanced CWB generally reduces EMTRs for single individuals without children with income between \$3,000 and approximately \$19,000 in earnings as a result of the increased maximum benefit and lower phase-out rate of the benefit. However, the enhanced CWB also increased EMTRs for unattached individuals with incomes between approximately \$19,000 and \$24,000. Over this range of income, individuals under the CWB continue to have their benefit clawed back whereas under the WITB their benefit would have already been reduced to zero.

Chart 10: EMTRs for a single parent with one child in Ontario with and without the introduction of the Canada Child Benefit (2019)



Budget 2016 introduced the CCB, which combined the previous Universal Child Care Benefit (UCCB), an equal benefit to all parents regardless of income, with the income-tested Canada Child Tax Benefit (CCTB) and National Child Benefit supplement (NCBs). EMTRs for a single parent with one child under 6 with and without the policy change are shown in Chart 10. The new CCB provides a higher maximum benefit for low-income parents, but fully phases out for high-income parents. For single parents earning less than \$48,000, the EMTR is lower under the new CCB. This is due to a higher phase-out income threshold and lower phase-out rate under the CCB than the NCBs. However, at higher levels of income, EMTRs are higher under the new CCB due to the CCB having a higher phase-out rate than the CCTB.

Ontario provincial policy changes: CARE and LIFT

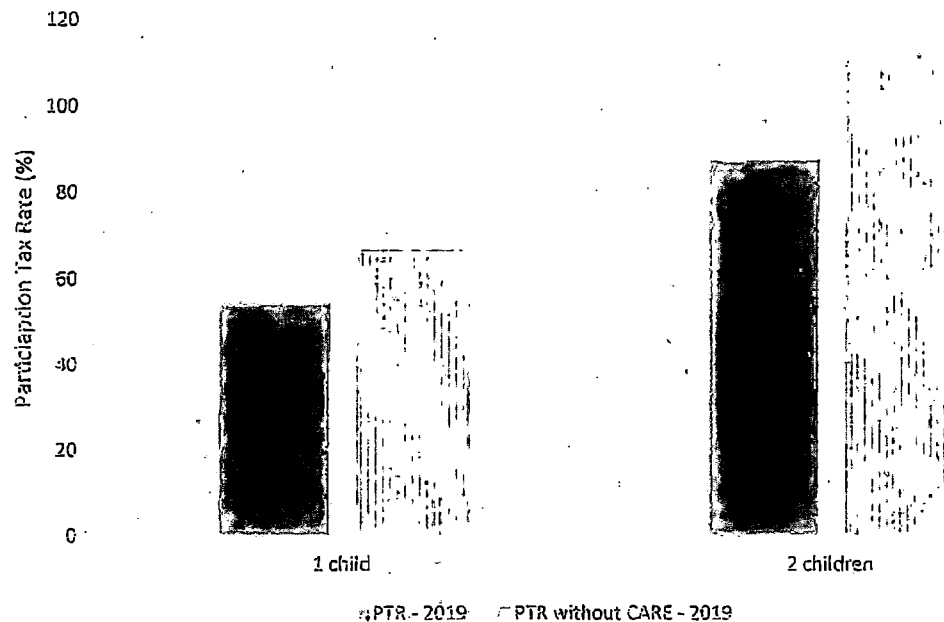
As Ontario is used to illustrate changes since 2014, new policies introduced by the Ontario government are also seen to affect EMTRs. In particular, Ontario's 2019 Budget²⁷ introduced two new measures – the Ontario Child care Access and Relief from Expenses (CARE) tax credit and the Low-income Individuals and Families Tax (LIFT) credit:

- The CARE tax credit applies at a rate of 75 per cent to eligible child care expenses for families with up to \$20,000 in income, and this tax credit rate declines as family incomes increase.

²⁷ The LIFT credit was first announced in Ontario's 2018 Economic Outlook and Fiscal Review, but implemented through its 2019 budget.

- The LIFT credit provides a maximum credit amounting to the lesser of \$850 or 5.05 per cent of employment income (maximizes at roughly \$16,800 in income), to be reduced by 10 per cent of the greater of adjusted individual net income over \$30,000 or adjusted family net income over \$60,000 (phased out at \$38,500 in individual income or \$68,500 in family income).

Chart 12: PTRs for a secondary earner in Ontario with and without the CARE tax credit



The impact of the CARE tax credit is shown in Chart 12, which displays the PTR that would be imposed on a secondary earner in Ontario joining the workforce as a full-time minimum wage employee (\$26,000 in earnings), with a spouse earning \$50,000. The PTR in this case reflects the portion of income that would be lost to taxes, reduced benefits, and child care costs upon the secondary worker entering the workforce. A family that begins paying for child care when a second spouse enters the workforce would be able to claim the CARE tax credit, reducing PTRs on the income of the secondary earner. Without CARE, the PTR on a secondary earner in a family with two children surpasses 100 per cent.

Chart 13: EMTRs for an unattached individual in Ontario with and without LIFT

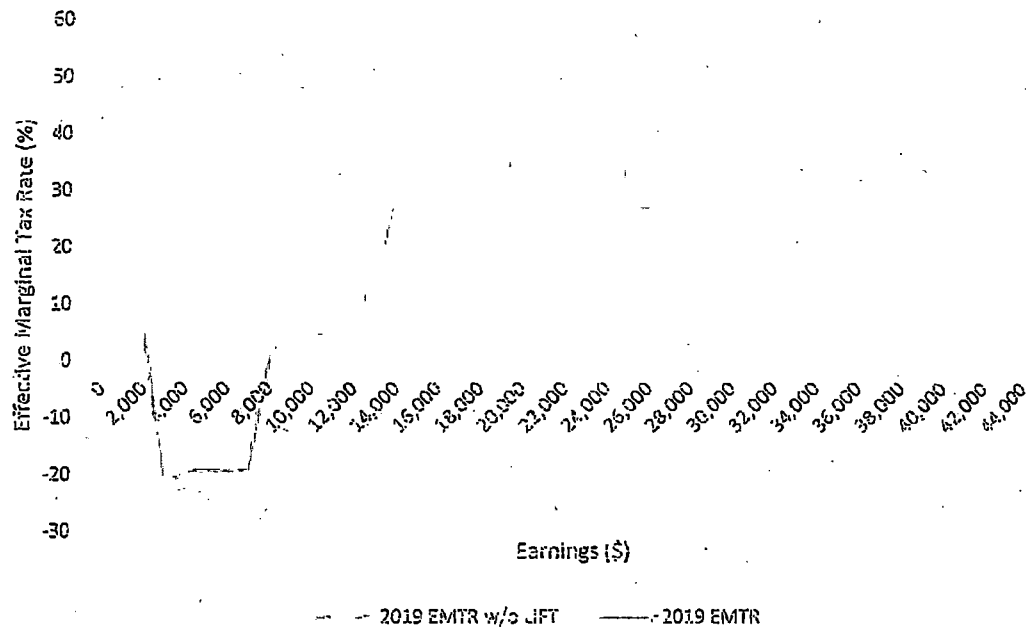
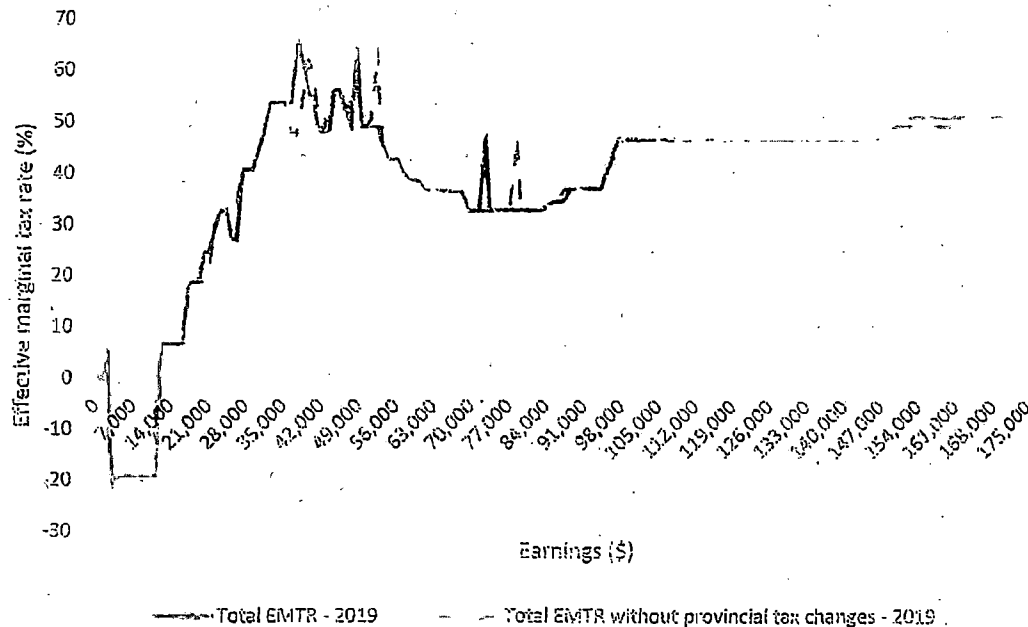


Chart 13 displays EMTRs with and without the LIFT credit for single unattached individuals. At low incomes, LIFT reduces EMTRs as the value of the credit increases with employment income up to a maximum individual benefit of \$850. However for higher incomes, LIFT increases EMTRs as the benefit is phased out. The EMTR impact of LIFT is less apparent for other family types due to the dynamics of the program parameters. LIFT is a non-refundable tax credit that is capped at the amount of Ontario personal income tax payable.

Chart 14: EMTRs for a single parent with one child in Ontario, with and without provincial tax policy changes since 2014



Note: EMTRs on earnings above \$180,000 are not displayed, including the top marginal provincial income tax rate at \$220,000.

Ontario marginal income tax rates have been the same since 2014 when the province lowered the top tax bracket income threshold and introduced a new, higher marginal income tax rate on incomes between \$150,000 and \$220,000. However, certain Ontario income tax thresholds are not indexed to inflation, and have therefore declined in real terms since 2014. Thresholds not subject to indexation include:

- the income threshold for the second-highest Ontario income tax bracket (12.16 per cent on incomes between \$150,000 and \$220,000);
- the income threshold for the highest Ontario income tax bracket (13.16 per cent on income over \$220,000); and,
- income thresholds for the Ontario Health Premium.

The non-indexation of income tax thresholds can be seen in Chart 1 above. Notably, the Health Premium "spikes" are shown to shift down (at around \$38,000, \$48,000, and \$78,000 in income) since the parameters of the 2014 tax system are illustrated in 2019 constant dollars.

These EMTR "spikes" arise due to the structure of the Ontario Health Premium, which is characterized by rapid increases over very short income ranges. For example, the Premium is set at \$450 for individuals with income between \$38,500 and \$48,000, and then increases at a rate of 25 per cent of income between \$48,000 and \$48,600.

Conclusion

EMTRs and PTRs can vary widely across the country and across individuals' particular circumstances, but tend to be especially high for low-income workers on social assistance and for workers in modest- or middle-income families with children. These unintended consequences of the tax and transfer system create significant disincentives to work and invest in human capital. Federal- and Ontario-level policy changes since 2014 have had some effect on EMTRs and PTRs, particularly at the lower end of the income distribution, but have not resulted in dramatic shifts.

Annex A – Child Care Cost Assumptions

A number of assumptions were made for the purpose of including child care costs in the analysis of secondary earner PTRs. Part-time child care was defined as those with more than 15 but less than 30 hours of care per week, while full-time care ranged from 30 to less than 45 hours of care per week. The families captured in SELCCA making use of part-time child care under this definition had an average of 22 to 23 hours of child care per week across the provinces and territories, while those in the full-time group made use of an average of 37 to 38 hours of child care per week.²⁸

SELCCA captures out of pocket child care costs, and these may reflect direct municipal or provincial subsidies to care providers made on behalf of survey respondents. To the extent that these subsidies are reduced based on family income, these would have an impact on EMTRs and PTRs that is not captured in this paper (see Annex B for a discussion of other policies that are not captured). In the scenarios considered in the analysis of PTRs for secondary earners, the combined family earnings are generally above the point at which these targeted subsidies are fully phased out, such that PTRs should not generally be affected at the income ranges being considered. Furthermore, Canadian Income Survey data (2016) shows that median earnings for families incurring child care expenses and with children under the age of 5 are typically much higher than the point at which these subsidies are fully phased out, such that median child care costs captured using SELCCA data are not likely to include targeted child care subsidies.

Table A1: Annualized full- and part-time child care costs

	Part-time	Full-time
NL	5,200	8,580
PE	4,212	7,020
NS	4,680	7,488
NB	4,680	7,800
QC (subsidized)	1,200	2,160
QC (market)	6,045	10,075
ON	6,240	11,180
MB	4,992	5,200
SK	6,000	7,500
AB	7,200	9,600
BC	6,000	10,800
YT	7,800	9,600
NT	7,116	12,000
NU	6,000	10,400
CAN	5,400	7,280

Source: Median child care costs estimated using data from the 2019 Survey on Early Learning and Child Care Arrangements (SELCCA). Data for Quebec subsidized part-time child care based on child subsidy program parameters. Data estimates for Quebec market costs based on data gathered by the Canadian Center for Policy Alternatives (2019, *Developmental Milestones: Child care fees in Canada's big cities 2018*)

²⁸ In both cases, children that primarily attended before- and after-school programs were excluded, because these children were school aged. While they would fall under the definition of part-time child care based on number of hours in child care, the parent would be able to pursue full-time work.

In Quebec, there are two systems through which child care expenses are made more affordable to families. The subsidized child care program run by the province has families pay a set daily fee for child care, which is much less than the typical market fee. Families with income above a given threshold are then required to pay an additional contribution at the end of the year as they file their taxes. This additional contribution is effectively a top-up to the set daily subsidized fee that grows with income up to a maximum.²⁹ The non-subsidized system reimburses families a portion of their child care expenses through an income-tested refundable tax credit generally at the end of the year. Because the dual nature of this child care system presents families with such distinct child care options, child care expenses were estimated for both the subsidized and non-subsidized child care systems in this province.

- For the subsidized system, annualized median child care expenses for those with 30 to less than 45 hours of child care per week (obtained through SELCCA) were consistent with estimates of full-time child care costs under the subsidized system's parameters before including the additional contribution. As such, this was the value used for full-time subsidized care in Quebec. For part-time subsidized care, back-of-the-envelope estimates using program parameters and assuming 22 hours of care per week (roughly equal to three 7.5 hour shifts) yielded an annual cost for part-time care that aligned itself with the unweighted average ratio of part-time to full-time child care costs as seen in the other Canadian provinces and territories. An additional contribution amount was then added to the cost of child care using Quebec family net income and program parameters (the additional contribution was also included in calculating the child care expense deduction).
- For the cost of full-time non-subsidized care, data gathered by the Canadian Center for Policy Alternatives³⁰ yielded median monthly fees at non-subsidized child care facilities (\$10,077) that aligned with the second mode in the bi-modal distribution of full-time child care costs in Quebec obtained using SELCCA data (\$10,073). Annual part-time fees were then obtained using a 6-to-10 ratio, which was slightly lower than the average part-time to full-time ratio obtained using SELCCA data, but slightly higher than the ratio that our typical part-time and full-time workers were assumed to work (22h part-time and 37.5h full-time).

²⁹ In 2019, the base daily fee is \$8.25, and the additional contribution starts phasing in at Quebec family net income of \$78,320, and reaches its maximum of \$13.20 per day at Quebec family net income of \$166,320. Quebec has announced that it will be gradually phasing out income-testing over 2019-2022.

³⁰ Canadian Centre for Policy Alternatives. (2019). *Developmental Milestones: Child care fees in Canada's big cities 2018*

Lastly, Table A2 below shows the secondary earner assumptions used to calculate PTRs for secondary earners.

Table A2: Full- and part-time earnings assumptions used in the calculation of PTRs for secondary earners

	Minimum Wage (\$)	Annual Full-Time Earnings ¹ (\$)	Annual Part-Time Earnings ² (\$)
NL	11.15	20,906	12,265
PE	12.25	22,969	13,475
NS	11.55	21,656	12,705
NB	11.50	21,563	12,650
QC	12.50	23,438	13,750
ON	14.00	26,250	15,400
MB	11.65	21,844	12,815
SK	11.32	21,225	12,452
AB	15.00	28,125	16,500
BC	13.85	25,969	15,235
YT	12.71	23,831	13,981
NT	13.46	25,238	14,806
NU	13.00	24,375	14,300

1. Based on 37.5 hours per week, 50 weeks per year

2. Based on 22 hours per week, 50 weeks per year

Annex B – Programs Omitted from Typical EMTRs and PTRs

The EMTRs and PTRs calculated using typicals may not reflect all the financial disincentives to work that an individual experiences due to the tax and transfer system. These disincentives are estimated based on measures that apply to the general working-aged population of Canada, and exclude many benefits that only apply to particular groups of individuals. Thus, the true disincentives an individual faces may be higher than those estimated using typicals, depending on how many of these excluded programs this individual is eligible for and intends to use.

Such benefits commonly fall in the areas of support for housing, education, and health care. Examples of each are discussed below.

Targeted Housing Programs

One of the program categories not included in calculating typical EMTRs, which perhaps has the greatest potential impact on an individual's incentives to work, is comprised of housing programs. These seek to make housing more affordable for those in need, but vary greatly both across and within the provinces and territories. In most cases, the legislation governing affordable housing programs is enacted by provincial or territorial legislatures, but this legislation normally gives service providers and municipalities a large amount of discretion on implementation.

Funding for these programs is usually provided jointly by the province and CMHC (under an Investment and Affordable Housing Agreement), and these programs often suffer from very long waiting lists, as supply is much lower than demand. Ontario's Ministry of Municipal Affairs and Housing, for example, reports that 94,000 Ontarian households are receiving help to pay rent or make a down payment (as of April 8, 2019). This compares to over 700,000 individual Ontario taxfilers who reported receiving social assistance payments in 2017. According to the City of Toronto's website, it can take years for an applicant to get housed under a rent-geared-to-income subsidy, and they encourage applicants to consider subsidized housing as a long-term housing plan.³¹ Because only a relatively small proportion of the population falls under such programs, and because parameters for these programs often vary (even within a given province), they are not included in typical EMTRs.

Subsidized Rent

Subsidized rent, also known to as rent-geared-to-income (RGI), is perhaps the most common kind of affordable housing program provided in Canada. An individual must have income below a given threshold³² to qualify for such a program, and in many cases, after qualifying, they are put on a waiting list for a vacancy to present itself. Under this kind of program, an individual's rent is capped at a fixed percentage of their income.

This kind of benefit has a substantial impact on an individual's EMTRs. For every dollar that a tenant's income increases, their rent increases in proportion. This increase in rent in turn

³¹ In Quebec, just over 90,000 households received assistance paying rent in 2011 through one of the Government's subsidies compared to about 320,000 individual Quebec taxfilers who reported social assistance payments in 2017.

³² Determined based on family size, and often differing across cities.

reduces disposable income. Below are two examples of subsidized rent programs in Canada, followed by an example of how these impact EMTRs.

- In Quebec, the "Programme habitation à loyer modique" (HLM) provides public subsidized housing where beneficiaries pay a maximum of 25 per cent of their income in rent (based on the previous year's tax return). Roughly 60,000 households were served under this program in 2011. Another subsidized housing program in this province is the "Supplément au loyer," which provides the same level of rent subsidy, but allows individuals to rent from cooperative housing, the not-for-profit sector, and private service providers. For the supplement, rental assistance is based on CMHC's published rental rate estimates, and varies by region. The minimum income thresholds for eligibility also vary by region.
- In Ontario, subsidized housing is administered by service managers (usually NGOs working closely with municipalities) in accordance with the Housing Services Act, 2011. As in Quebec, applicants must have annual income below a given threshold in order to qualify (which varies based on family size), but in Ontario, the RGI program caps rent at 30 per cent of a tenant's gross monthly income (as opposed to last year's income). In this regard, subsidized housing in Ontario operates much more like social assistance than is the case in Quebec, and the added responsiveness of the program may make the impact on EMTRs more visible to recipients.

If a single individual living in Montreal had annual income last year of \$20,000, they would qualify for subsidized housing under the HLM program, as their income would have been below the \$29,000 threshold set for single individuals in this region. If this person was then provided with a one-bedroom apartment, which has an average rental rate of \$715 per month in this region according to CMHC's published estimates, then their annual subsidy would be worth \$3,580. If their income rose by \$1,000, such that they earned \$21,000 in the following year, then they would be expected to pay an additional \$250 towards their rent and their subsidy would be reduced to \$3,330. Thus this increases this individual's EMTR by 25 percentage points, or the fixed percentage at which rent is capped. This increase in EMTRs is on top of that estimated under typicals.

In addition to this upward shift in EMTRs over the income range up to the eligibility threshold, there is a discontinuous cliff beyond which the benefit is completely eliminated. If this individual were to earn \$28,999 in one year and \$29,000 in the next, they would lose out on \$1,330 worth of housing subsidies for the year following the one in which they earned \$29,000. This, in conjunction with the long waiting lists for getting into subsidized housing³³, could create a very significant barrier to individuals increasing their labour supply.

Other Affordable Housing Programmes

Examples of non-RGI affordable housing programs include the Affordable Housing Program (Ontario) or the Investment in Affordable Housing for Ontario programs, which would not impact EMTRs in quite the same way as the RGI program. These programs build housing units using federal and provincial subsidies, and these housing units charge a fixed rental rate that is below

³³ The City of Toronto website reports that "an applicant can expect to wait: seven years or more for a bachelor unit, 12 years or more for a one-bedroom unit, 10 years or more for larger unit sizes." Individuals who eventually obtain one of these units may be highly reluctant to give it up, either because they fail to view the wait as a sunk cost, or because of the risk that a return to the labour force may be temporary.

market value (in Ottawa, these are set to 80 per cent of CMHC rental rates). Because the rental rate is fixed and does not vary based on a tenant's income, EMTRs are not impacted. However, in order to remain eligible for the program, the tenant still needs to remain in housing need, which presents a similar eligibility cliff as mentioned above. If the same individual in the above example were to occupy a non-RGI affordable housing unit, then their annual savings in rent would be \$1,716 ($\$715 \times 12 \times 0.8$). Going over the eligibility threshold would result in a loss of this benefit, which could create a nontrivial disincentive for this individual to increase their labour supply.

Shared Equity Mortgages

Shared equity mortgages are a form of financial assistance offered to moderate-income households to assist in the purchase of a new home. In most cases, these programs will top up a family's down payment on the purchase of a new home in order to reduce the monthly payments on their loan. The government's top-up on the down payment is an ownership stake in the family's property, but the government will generally not charge interest or payments on this amount; instead, the government will share any capital gain or loss made on the property with the purchaser.

The Homeownership component to Ontario's Investment in Affordable Housing Program, or Budget 2019's more recently introduced First-Time Home Buyer Incentive (FTHBI) are examples of such programs. These produce disincentives to work in that they are targeted to moderate income families. The Homeownership component in Ontario, for example, is only available to families with household income below the 60th percentile in the province. Similarly, the FTHBI is only available to families with household income below \$120,000. In both cases, the eligibility threshold may create an inducement to limit the labour supply of prospective families wishing to take advantage of the program in a particular year.

Cash housing benefits

Another category of housing programs that affect an individual's work incentives is housing benefits, which provide a rent subsidy directly to the individual and which is not tied to a particular housing unit. An example of such a program is Ontario's new Portable Housing Benefit, which is designed specifically to help the survivors of domestic violence and their families. This benefit is paid to recipients directly, is phased out based on adjusted family net income, and gives a maximum benefit amount equal to 80 per cent of average market rent.

In Quebec the "programme Allocation-logement" run by Revenu Québec on behalf of the Société d'habitation Québec is funded jointly by la Société and CMHC, and provides a rent subsidy directly to low-income seniors or families with children, so long as their income is below a set provincial threshold. This benefit is a maximum of \$80 per month, and is paid out directly to tenants. The amount varies based on their rent and family composition, and the threshold is based on annual income. The eligibility cliff is set quite low for this benefit, and given the benefit's size, which could be substantial, could present individuals with a steep reduction to their disposable income should their income grow beyond that threshold.

Renovation subsidies

Another set of targeted housing programs includes renovation subsidies such as Enbridge's Home Winterproofing Program in Ontario. This program essentially incentivizes individuals to

invest in winterproofing their home, making it more energy-efficient. The subsidy is phase-out based on annual gross income, with phase-out thresholds increasing based on household size³⁴. Enbridge is mandated to run this program by the Ontario Energy Board and Independent Electricity System Operator, who set the rules for the phase-out. This program could impact the work incentives facing an individual if they are considering the kind of home renovations covered. It's important to note, however, that many individuals living in low-income may not own their own home. Furthermore, renovations of this nature are typically undertaken very infrequently, such that this benefit can be considered atypical. It does serve as an example of the array of programs that can impact individual work incentives outside of the more common tax and benefit measures though.

Targeted Education and Training Programs

Another group of programs that would raise an individual's EMTRs includes all income-tested programs that help offset the costs of pursuing education or training. Perhaps the biggest of these are the Canada Student Grants, which, depending largely on an individual's household income,³⁵ gives non-repayable grants to individuals who pursue college or university.³⁶ As an individual's household income rises above a given threshold, these grant amounts are gradually reduced, increasing the EMTRs of individuals with household income above the threshold if they have a family member seeking grants to pursue college or university education.

There are also income-tested programs that encourage and reward saving for a child's postsecondary education. These include the Canada Learning Bond (CLB) and the Canada Education Savings Grant's (CESG's) additional amount. The CLB is an amount that is added each year to a child's Registered Education Savings Plan (RESP), so long as that child's primary caregiver has adjusted family net income below the eligibility threshold. The CLB amount in the first year is \$500, and amounts for future years in which the child is eligible are \$100. The Additional amount of CESG is equal to 10 or 20 per cent of the first \$500 contributed to an RESP each year, depending on the primary caregiver's adjusted family net income.³⁷

These income-tested education savings programs increase EMTRs discontinuously at the thresholds beyond which they are reduced or eliminated entirely. The CLB and first step of the Additional amount of CESG both phase-out at the beginning of the second federal income tax bracket (for the CLB, this threshold increases with the number of children above three). For families aspiring to have their children attend postsecondary education, this can present an small discontinuous increase to their EMTRs, and if they are saving to have several children attend postsecondary, then the effect is multiplied. It is worth noting that, aside from the initial \$500 CLB amount, these sums can be thought of as being relatively small.

³⁴ Though families in receipt of Government financial assistance programs including Ontario Works or the Guaranteed Income Supplement are not required to meet the income test.

³⁵ The exact income that is used to phase out the grants depends on a number of factors, including the individual's living arrangements and work history.

³⁶ Canada Student Grants and Loans are not available in Quebec, the Northwest Territories, or Nunavut: these regions run their own programs. In other provinces and in Yukon, Canada Student Grants and Loans are also often supplemented by provincial grants and loans.

³⁷ This amount is \$100 (i.e. 0.2×500) if the primary caregiver's adjusted family net income is below the second federal income tax bracket, and \$50 (i.e. 0.1×500) if this income is below the third federal income tax bracket.

The new Canada Training Credit (CTC) also features an income test. Individuals with between \$10,000 and \$150,000 in earnings from work in a year aged 25 to 64 accumulate a credit of \$250 per year, up to a lifetime training amount limit of \$5,000. This credit can then be used to claim a refundable tax credit for up to half the eligible tuition and fees for taking a course or enrolling in a training program. As with the education savings programs, these annual credits are small relative to the income required to disqualify an individual from the program.

Targeted Health Care Programs

Another group of programs that are not included in the calculation of typical EMTRs and PTRs is income-tested programs that seek to help offset the costs of health care products or services not otherwise covered by the health care system. These often take the form of targeted insurance coverage.

An example of such a program includes the Alberta Child Health Benefit, which covers the health expenses of dependent children from families with low incomes. The program provides coverage for dental care, prescription drugs, eye exams and glasses, ambulance services, and diabetic supplies, but this coverage is eliminated if income rises above a given threshold, where the threshold increases with family size.

For families that make use of the Alberta Child Health Benefit, the costs they expect to face in the absence of coverage would directly reduce their disposable income if they no longer meet the income test, and thus produce a disincentive to raise income above the phase-out threshold. This disincentive is proportional to the anticipated costs currently covered by the program.

In other provinces, coverage for these health costs are sometimes dealt with under separate programs. In Ontario, for example, the Healthy Smiles Ontario program offers limited dental coverage for children under the age of 18; coverage is eliminated when family net income is above a given threshold (based on the number of children in the family). Drug coverage is provided through the Ontario Drug Benefit³⁸, which provides prescription drug coverage for those under the age of 24 who are not otherwise covered by a private insurance plan, as well as those on social assistance. Note that the Ontario Drug Benefit is not in itself subject to an income-test, but in order to remain eligible for this coverage, beneficiaries have to stay on social assistance, and this may introduce an added disincentive to work on top of that which results from the phase-out of social assistance.

It is difficult to quantify the impact of these benefits on an individual's EMTRs or PTR because support is delivered in-kind and when needed. Furthermore, each individual's perception of the value of these benefits could be different, and it is ultimately the perceived value of the benefit that would impact work decisions. For these reasons, these are not included in EMTR or PTR calculations.

³⁸ The Trillium Drug Program in Ontario also provides a degree of catastrophic coverage to Ontarians more broadly, whereby they must pay a maximum of 4 per cent of their after-tax household income on prescription drug costs.

Annex C – Additional Charts

Chart C1: EMTRs of an unattached individual on social assistance in Quebec (2019)

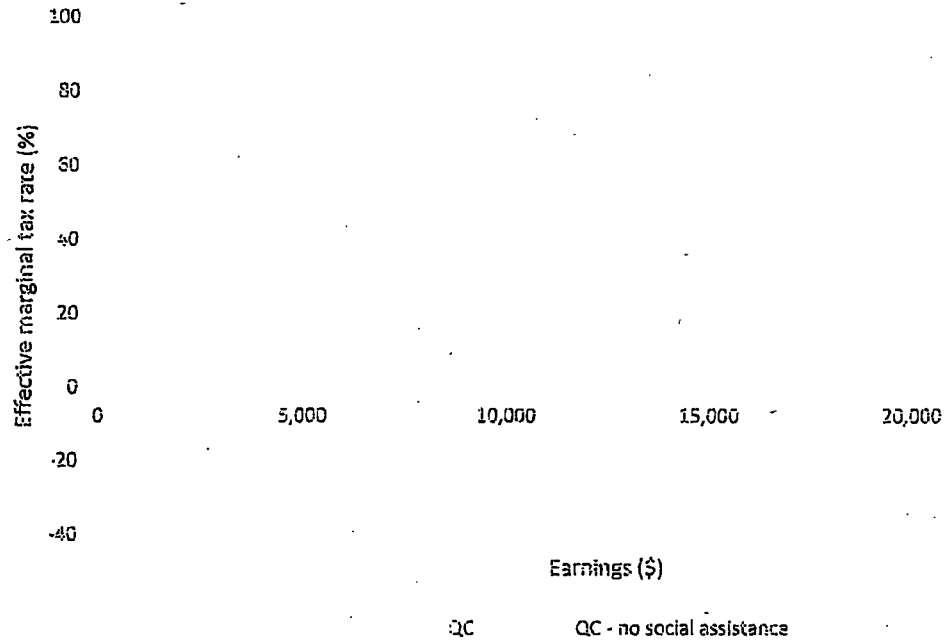


Chart C2: EMTRs of an unattached individual on social assistance in British Columbia (2019)

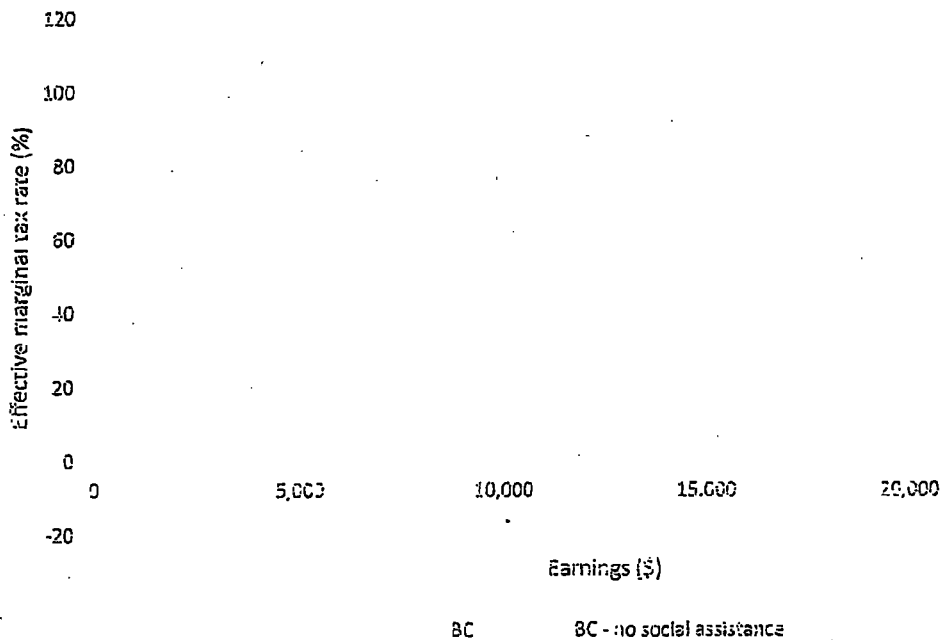


Chart C3: EMTRs of an unattached individual on social assistance in Alberta (2019)

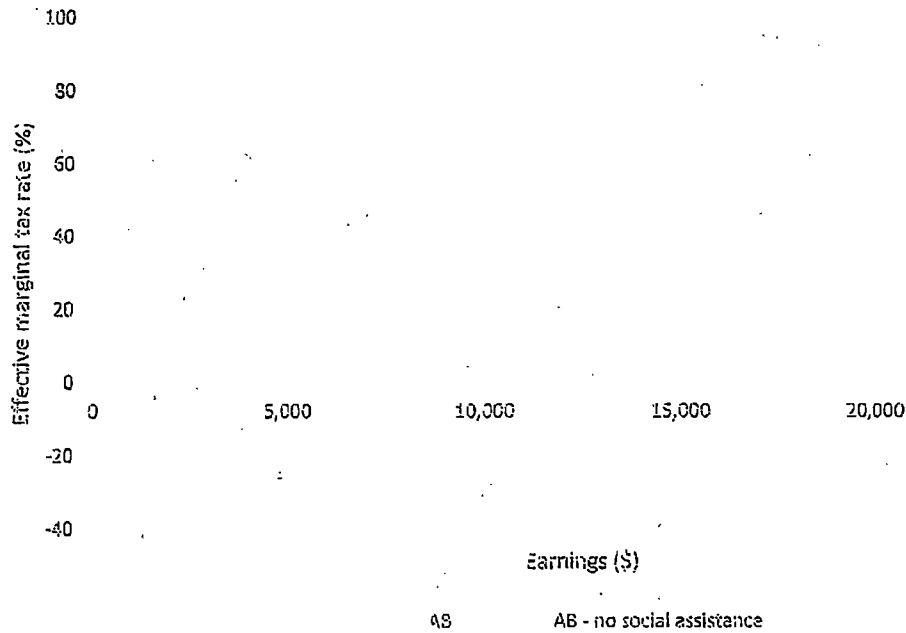


Chart C4: EMTRs of single parents with one child under six in selected provinces (2019)

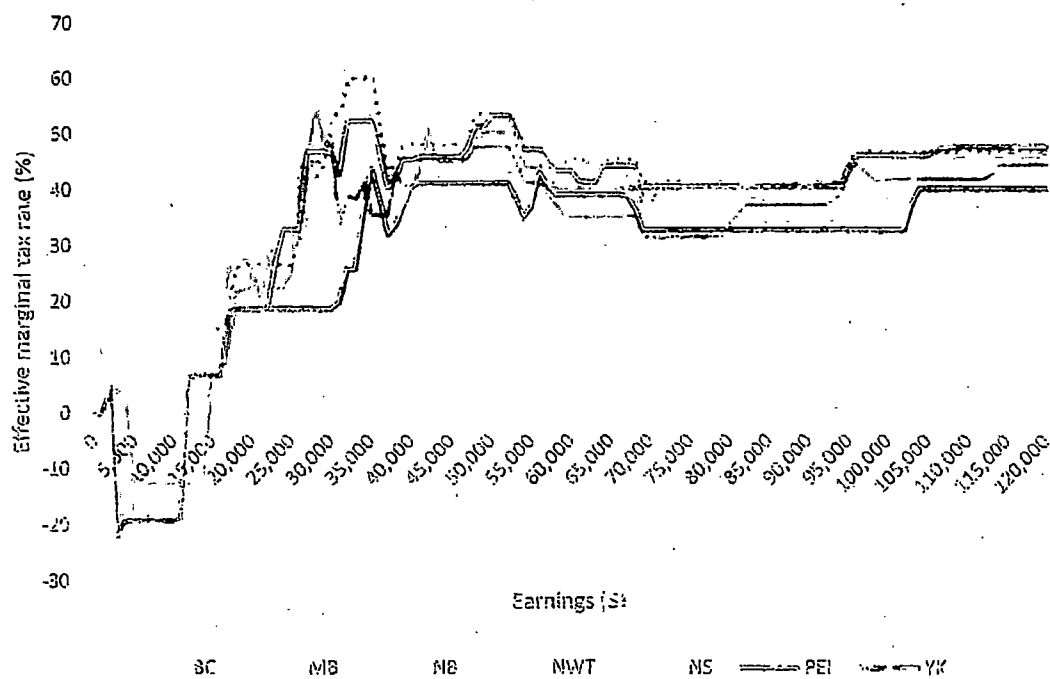


Chart C5: PTRs of secondary earners across Canada with child care costs associated with the full-time care of one child, and with primary earners at selected levels of personal income (2019)

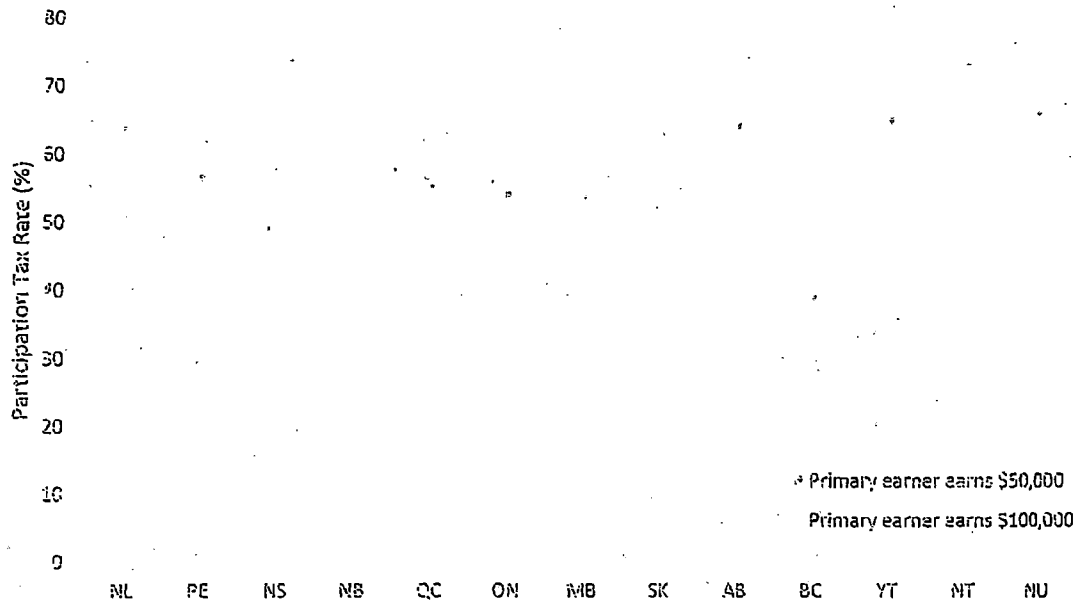
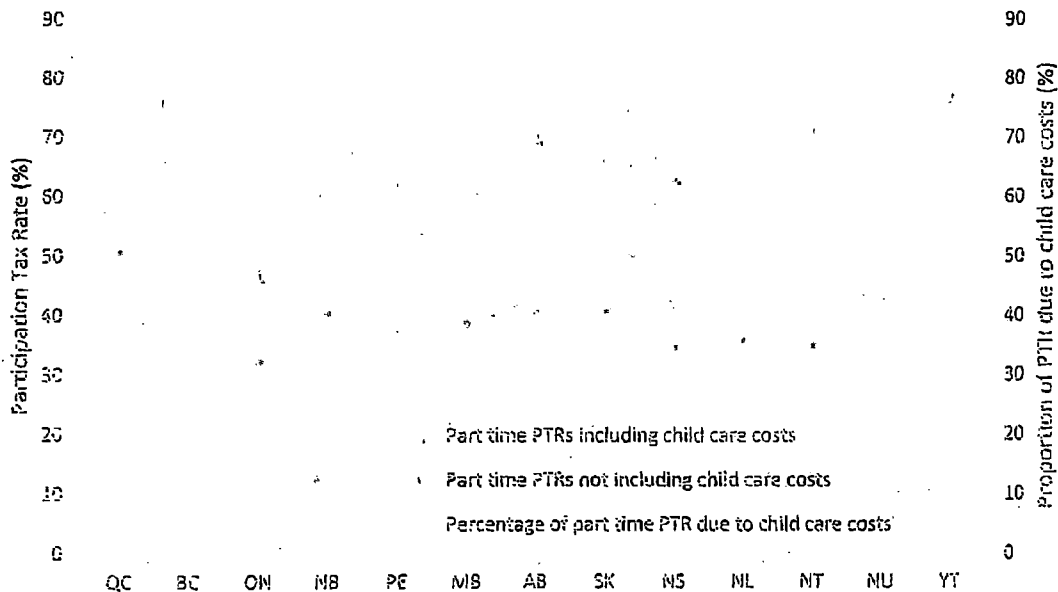


Chart C6: PTRs for secondary earners across Canada with and without child care costs associated with the part-time care of one child, and the proportion of PTRs attributed to child care costs (2019)



Distributional Analysis of Effective Marginal Tax Rates

1. Introduction

The aim of this note is to analyze the distribution of effective marginal tax rates (EMTRs) on labour income among Canadians aged 18 to 64 years using 2017 survey data¹ and considering the federal and provincial tax and transfer systems as they were in 2017. EMTRs refer to the amounts of taxes owed and the reduction of benefits resulting from earning additional income through an increase in work hours or wages. EMTRs are generally derived on the basis of hypothetical scenarios. Such an approach uses the tax and transfers rules to compute EMTRs for various typical cases (e.g., unattached individual without kids residing in Ontario and with given amount of annual earnings), assuming they are receiving all benefits for which they are eligible. While useful for identifying potentially problematic cases (i.e., circumstances where individuals are especially likely to face high EMTRs), the approach simplifies the reality with regards to benefits take-up and the mix of possible individuals' income situations and characteristics and does not allow to produce descriptive statistics. By using an approach based on survey data, the current analysis is amongst the first in Canada to account for the actual rates of benefits, income situations, and characteristics of individuals. This approach is especially useful for identifying and examining individuals who are actually facing high EMTRs. The main goals of the note are to provide a comprehensive overview of EMTRs in Canada (federal, provincial and combined) as well as to identify the actual number of workers facing high EMTRs, their characteristics and the type of taxes and benefits that are involved.

The remainder of this note is as follows. Section 2 describes the population of interest for calculating EMTRs and Section 3 presents the distribution of EMTRs among this population. Section 4 and 5 examine the contribution of the federal and provincial tax and transfer systems and the characteristics associated with high EMTRs. Section 6 discusses the main causes of high EMTRs in Canada. Methodological information, including definitions of EMTRs (and participation tax rates (PTRs)²), details about the data, the tool and methodology used to derive actual EMTRs can be found in the annexes.

¹ Statistics Canada's Social Policy Simulation Database/Model (SPSD/M) version 27.0 for the 2017 tax year was used to conduct the current project. The SPSD/M was designed to support the analysis of personal income tax, sales tax and income transfer policies. The SPSD/M database has been constructed from four major sources of microdata: 1) the Canadian Income Survey (CIS); 2) the personal income tax return data; 3) Employment Insurance (EI) claim histories; and the Survey of Household Spending (SHS). A weight has been assigned to all members of the SPSD/M database (all members of the same household have identical weights). Each weight provides a factor which blows estimates up to the national level. Note that the SPSD/M population (weighted or not) excludes the Yukon, Nunavut, Northwest Territories, inmates in institutions, Indians on reserves, and certain members of the armed forces.

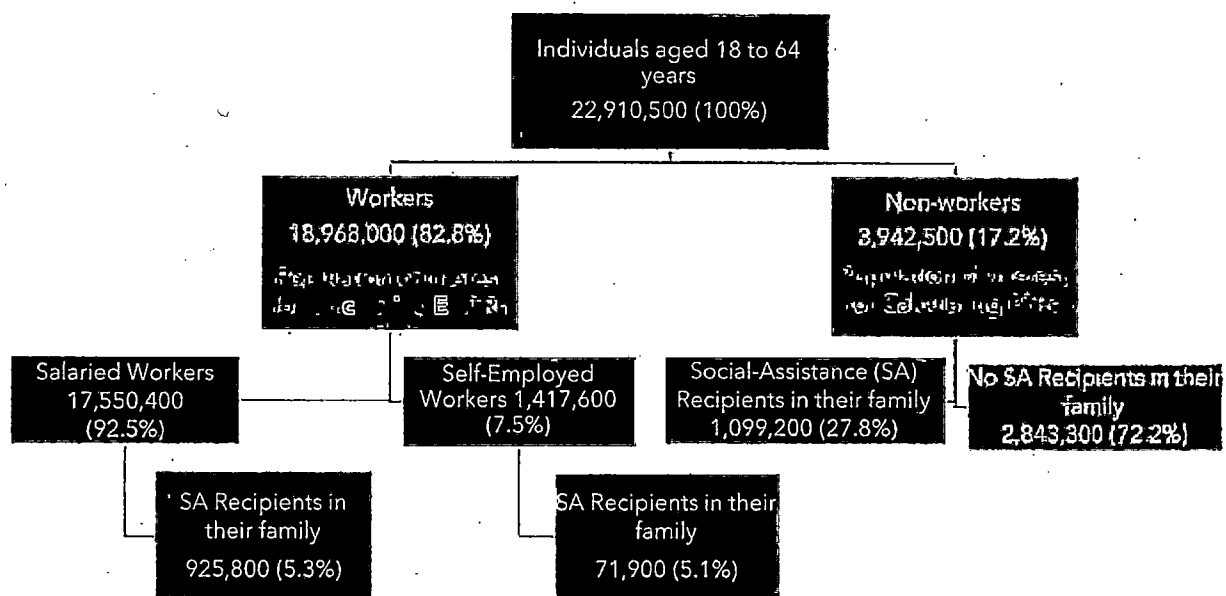
² An analysis of the actual participation tax rates (PTRs) of non-working Canadians, i.e., the financial penalty encountered by individuals who are entering the labour force, will be included in future research.

2. Population of Interest for Calculating EMTRs

As the main goal is to examine EMTRs on labour income, the group of interest is limited to individuals who are the most likely to participate in the labour market, i.e., those aged 18 to 64 years. Below and above this age range, individuals are not expected to respond as much to lower or higher marginal tax rates on labour income. Among working-age individuals, those who worked during the year represent the population of interest for calculating EMTRs since only the employed may decide to increase their hours of work.

The following chart provides information on the distribution of the 2017 Canadian population along the various characteristics of interest for estimating EMTRs. It shows that among the 36.3 million Canadian individuals in 2017, 22.9 million (63.2%) were aged 18 to 64 years, and that among working-age individuals, close to 19 million (82.8%) reported some employment income during the year and formed the population of interest for calculating EMTRs. The remaining 3.9 million individuals (17.2%) is the population for which the calculation of the PTRs would be the most relevant³.

Chart 1 - Distribution of individuals aged 18-64 according to their employment status and social assistance receipt, 2017



Source: Author's calculations using Statistics Canada's SPSPD/M, v. 27.0.

The vast majority of individuals with employment income reported at least some wages and salaries (92.5%) and 7.5% only reported self-employment income. While most workers did not rely at all on social assistance (SA) income, a small proportion (5.3%) reported SA recipients in their families.

³ In the current note, calculations are based on income increments and do not account for cases where individuals chose to work less or leave the work force.

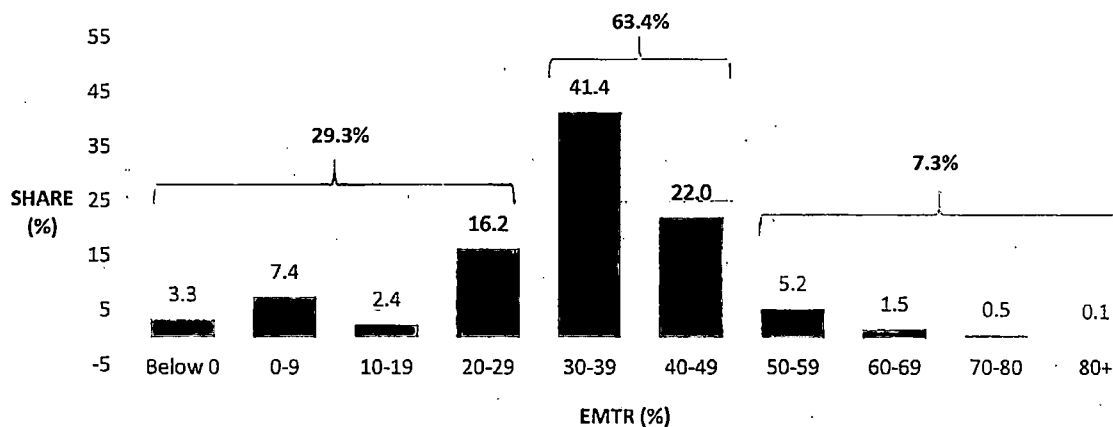
In total, close to 2.1 million working-age individuals, or 9.2% of them, had SA income in their family in 2017. Among all individuals with SA income in their family, 48% were employed and 52% were unemployed.

It is worth noting that family circumstances of workers and non-workers were quite different. In 2017, 40.0% of workers were unattached (i.e., they did not live with a spouse), 32.7% were the main income earner in a couple and 27.4% the secondary income earner. In comparison, these proportions were 46.2%, 12.5% and 41.3% respectively among non-workers.

3. Distribution of EMTRs among Workers aged 18-64

Among non-SA recipient workers, the average EMTR was 33.0% in 2017. The largest proportion (63.4%) faced EMTRs that were in the 30-49% range. About 29.3% of them faced EMTRs that were below 30% and 7.3% faced EMTRs of 50% or more.

Chart 2 - Distribution of EMTRs among workers aged 18-64 who were not in receipt of SA, 2017



Source: Author's calculations using Statistics Canada's SPSPD/M, v. 27.0.

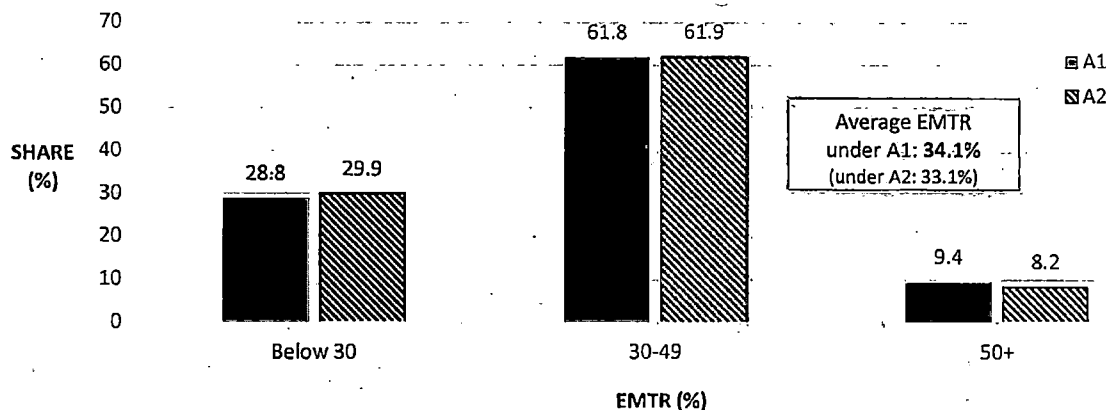
The distribution of EMTRs is quite different among workers who also rely on SA income. Workers with SA income in their family are more likely to face a 50% EMTR or more. Among them, the proportion facing such a high EMTR varies between 22.7% and 44.9% – depending on the assumption used for estimating SA claw back rates⁴ – compared with 7.3% among non-SA recipients. In this analysis, two assumptions were used for adjusting SA amounts among workers in receipt of SA. Assumption 1 supposes that periods of SA and labour income coincided for all workers and as such, that provincial SA claw back rules applied for everyone. Assumption 2 considers that periods

⁴ While SA income is included in SPSPD/M data, this source of income does not affect the calculation of EMTRs in SPSPD/M, meaning that increasing labour income does not decrease social assistance. For more accurate estimates for this group, adjustments to social assistance amounts are required. The method used for adjusting SA amounts is described in Annex C. It is important to note that this method does not account for potential indirect impact of SA claw backs on other benefit amounts (e.g., CCB or CWB amounts). Not considering such impacts may have resulted in an overestimation of EMTRs for some SA recipients.

of SA and labour income coincided for full-year workers, but not for part-year workers and as such, that SA claw back rules applied for the first group but not for the second – see Annex C for details on the methodology and estimation of SA claw back rates. The distribution of EMTRs among workers relying on SA is definitely sensitive to the assumption used for estimating the impact of labour income increments on SA income and the available information does not allow a firm choice as to which assumption applies best. Nevertheless, as Chart 3 indicates, because SA recipients represent only a small proportion of workers, the assumption retained does not have a significant impact on the overall distribution of EMTRs.

The proportions of all Canadian workers who faced EMTRs below 30%, EMTRs between 30% and 49%, and 50% or more EMTRs in 2017 are estimated at 30.4%, 62.3% and 7.3% respectively when the SPSPD/M base scenario is applied (i.e., when no change in SA income following labour income increments is assumed). In comparison, these proportions are equal to 28.8%, 61.8% and 9.4% when Assumption 1 of SA changes is applied, and to 29.9%, 61.9% and 8.2% when Assumption 2 is applied.

Chart 3 - Distribution of EMTRs among all Workers aged 18-64, using alternative assumptions (A1 and A2 in Annex C) for adjusting SA income, 2017



Source: Author's calculations using Statistics Canada's SPSPD/M, v. 27.0.

To ensure that EMTRs are not underestimated among SA recipients, Assumption 1 (A1) was retained for the rest of the analysis. Under A1, it is estimated that the 19 million workers in 2017 experienced an average EMTR of 34.1% (i.e., an average EMTR that is 1.1 percentage point higher than that experienced by the 18 million non-SA workers). This means that, on the whole, working Canadians would have benefited from \$659, on average, out of an extra \$1,000 in labour income. Of this additional \$1,000, \$341 would have been lost as a result of the application of the federal and provincial tax and transfer systems.

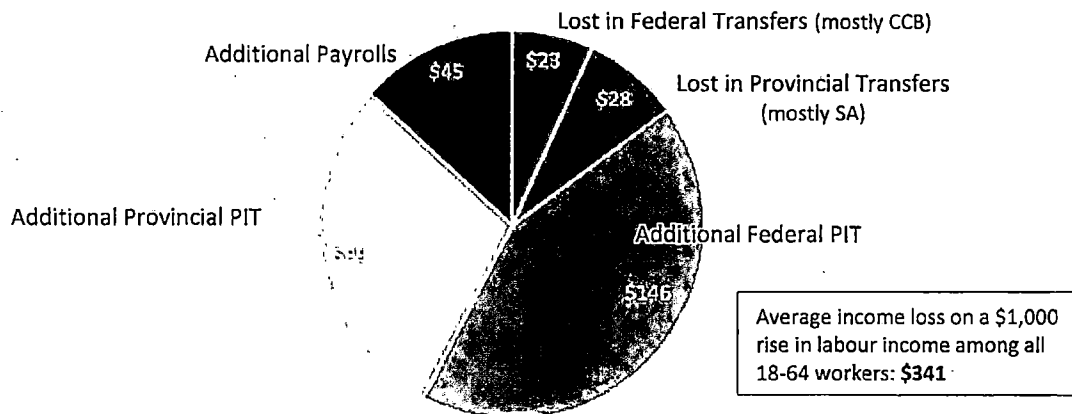
4. Contributions of the Federal and Provincial Tax and Transfer Systems

A rough decomposition of this 34.1% EMTR (Chart 4) suggests that, on average, the application of the federal personal income tax (PIT) and transfer system is responsible

for almost half of this \$341 average income loss compared with 37% for the provincial tax and transfer system and with 13% for the combined federal-provincial payroll taxes.

The impact of the federal tax and transfer system is mainly driven by the additional PIT that workers would have owed on an extra \$1,000 in labour income, and to a lesser extent by the reduction in federal transfer payments that they would have been entitled to, especially through reductions in Canada Child Benefit (CCB) amounts. The provincial impact is also particularly driven by the additional provincial PIT that they would have had to pay, but to a lesser extent. At the provincial level, it is mostly SA claw back rates that explains the average loss in government transfers.

Chart 4 - Contribution of changes in federal and provincial PIT and transfers, and in combined payroll taxes to the average EMTR of Workers aged 18-64, 2017

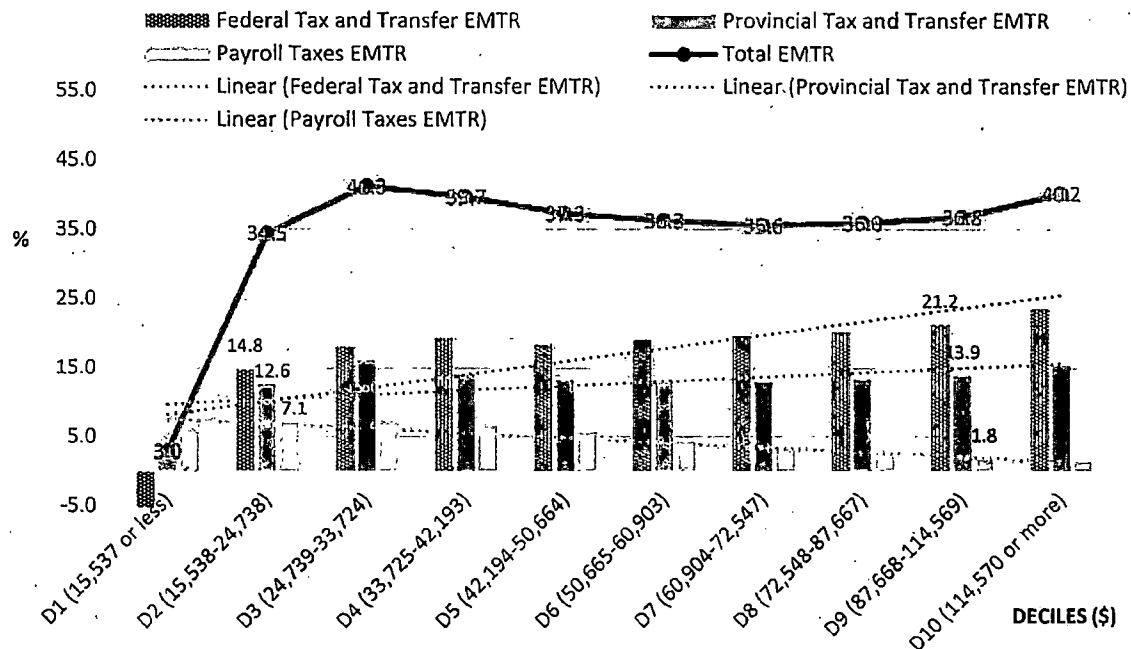


Source: Author's calculations using Statistics Canada's SPSPD/M, v. 27.0.

Because of the progressivity of federal and provincial PIT systems and because transfer programs are mostly targeted to lower income families, the contribution of taxes and transfers to workers' EMTRs varies across the family income spectrum. As Chart 5 shows, the average EMTR is significantly lower among workers who are part of the first family income decile (3.0%). Workers in the bottom decile would have retained almost the totality (\$970) of an additional \$1,000 in labour income in 2017, mainly due to the positive impact of the federal tax and transfer system. Compared to the first decile, average EMTR increases rapidly for workers in the second (34.5%) and third (41.3%) family income deciles. It then decreases slightly until decile 7 (35.6%), and starts to increase again afterwards, to reach 40.2% among workers in the top decile. Overall, workers in the third family income decile (i.e., those with an adjusted family income between \$24,739 and \$33,724) were those who faced the highest average EMTR in 2017 (41.3%), followed by those in the top decile. It is interesting to note though that, while the average EMTR was just slightly higher in decile 3 than in the top decile, the proportion of workers with a 50% EMTR or more was considerably higher in the third decile (23.6% versus 11.8%).

Chart 5 also shows that the contribution to total EMTRs of the federal tax and transfer system increases with family income decile. The contribution of the provincial tax and transfer system also tends to increase with family income decile, but less markedly. In contrast, the contribution of payroll taxes generally decreases with family income decile. For instance, the federal tax and transfer system, the provincial tax and transfer system and payroll taxes were responsible for about 43%, 37% and 21% respectively of the total 34.5% average EMTR observed among workers in decile 2 compared with about 58%, 38% and 5% respectively of the total 36.8% average EMTR among workers in decile 9.

Chart 5 - Total EMTR, federal and provincial tax and transfer EMTR, and payroll taxes EMTR among Workers aged 18-64, by adjusted* family income deciles, 2017



Notes: Adjusted family income is a more appropriate indicator of the socio-economic status of individuals since it accounts for the fact that family needs increase with family size. Similar to the approach often used in the literature, the adjusted family income of an individual is obtained by dividing the family income before the earning increment by the square root of the family size. "Linear" stands for "linear trendline".

Source: Author's calculations using Statistics Canada's SPSPD/M, v. 27.0.

As can be seen in Table 1, changes in federal and provincial transfer program entitlements mostly explain the average EMTR observed among workers in the bottom family income decile. In all other deciles though, changes in the amounts of federal and provincial PIT owed contribute mostly to EMTRs. In particular, the average increase in Working Income Tax Benefit (WITB) amounts and Goods and Services Tax/Harmonized Sales Tax Credit (GSTC)⁵ (+\$51, +\$7) entirely compensate the average increase in

⁵ On top of the basic GSTC, unattached individuals are eligible for an additional amount of credit when they reach a certain level of income. In 2017, a \$285 credit was provided for those who reported an income (for tax purposes) of \$9,263 or less. Then, the credit gradually increased to a maximum of \$435, remained at this value up to an income of \$37,193 and then gradually decreased to \$0.

payroll taxes that workers in the first decile encounter (+\$58). However, the rise in WITB, GSTC and provincial transfers other than SA is not sufficient to entirely compensate average PIT increases and SA claw backs.

Table 1 also suggests that, among all federal transfers, the WITB entitlement changes predominantly impact additional gains from work in deciles 1 and 2, whereas the CCB and GSTC have stronger impacts in deciles 3, 4 and 5. While the CCB continues to have small impacts in deciles 6 to 9, impacts of all other federal transfers are negligible among workers in these higher family income groups. It is worth noting that, for deciles 2 and 3, provincial transfers play a larger role in explaining workers' EMTRs than federal transfers, while the opposite is true for all other deciles.

As expected, as family income increases, the federal and provincial PIT reduce the gain from additional earnings. While this is also true for payroll taxes from deciles 1 to 3, the upward trend is reversed starting at decile 4, likely due to the maximum contribution thresholds.

Table 1 – Average loss in transfers and additional taxes owed on a \$1,000 rise in labour income among Workers aged 18-64, by adjusted family income decile, 2017

Average changes in \$	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Federal PIT	-6	-85	-118	-137	-149	-167	-177	-183	-200	-234
Provincial PIT	-1	-49	-80	-103	-110	-117	-122	-127	-135	-149
Federal transfers	59	-63	-62	-56	-35	-24	-20	-19	-12	-2
WITB	51	-59	-5	-1	0	0	0	0	-1	0
CCB	0	-3	-35	-35	-23	-22	-19	-18	-11	-2
GSTC	7	3	-15	-15	-11	-1	0	0	0	0
Others	1	-4	-7	-5	-1	0	0	0	0	0
Provincial transfers	-24	-77	-81	-38	-22	-14	-7	-6	-4	-4
SA	-30	-59	-31	-9	-8	-5	-5	-3	-3	-4
Others	6	-18	-50	-29	-14	-9	-2	-4	-1	0
Combined Payrolls	-58	-71	-72	-64	-58	-42	-31	-24	-18	-14
Total	-30	-345	-413	-397	-373	-364	-356	-360	-368	-403

Source: Author's calculations using Statistics Canada's SPSPD/M, v. 27.0.

5. Distribution of EMTRs by Characteristics of Workers

As previously mentioned, the average EMTR and the proportion of individuals who face an EMTR of 50% or more are considerably higher among workers who rely on SA. While especially important, being in receipt of SA is, however, not the sole factor increasing the likelihood of facing a high EMTR among workers. The presence of children is another factor that significantly increases the chances that workers encounter a high EMTR. As Table 2 indicates, 19.1% of workers with children in their family in 2017 faced an EMTR of 50% or more compared with 4.8% of workers in families without children. Among workers in families with children, lone parents were the most likely to face a high EMTR (35.1%), followed by those who were the main worker in two-parent families (21.7%), and then by those who were the secondary workers in such families (11.7%).

While less markedly, the distribution of EMTRs also vary depending on other demographic and socio-economic characteristics of workers. Notably, workers who lived in the province of Quebec, who were aged 35-44 years old and/or were recent immigrants in 2017 were slightly more likely to face an EMTR of 50% or more. Indeed, the proportions with an EMTR of 50% or more, were respectively 16.2%, 15.4% and 13.6% for these three groups compared to 9.4% for the overall population. To some extent, educational attainment and intensity of work are also correlated with the level of EMTRs among workers. In 2017, EMTRs calculated among those with a higher level of education and/or those who work full-time full-year (FTFY) were higher on average than among less educated workers and/or those who did not work FTFY. On the other hand, the distribution of EMTRs among these groups suggests that more educated workers and/or FTFY workers are less likely to face very low or very high EMTRs. In comparison with these two groups, the proportion of workers with EMTRs of at least 70% was higher among workers with less than a high school diploma and/or part-time or part-year workers.

Table 2 – Average and distribution of EMTRs among workers aged 18-64, by characteristics, 2017

CHARACTERISTICS	NB. (x1000)	EMTRs		DISTRIBUTION OF EMTRs					
		MEAN	50% EMTR or more	Under 30%	30- 39%	40- 49%	50- 59%	60- 69%	70% or more
ALL 18-64	18,968	34.1	9.4	28.8	40.4	21.4	5.3	1.7	2.4
SA RECEIPT									
Yes	998	53.5	44.9	21.1	23.4	10.6	7.2	4.6	33.3
No	17,970	33.0	7.4	29.3	41.4	22.0	5.2	1.5	0.7
PROVINCES									
Newfoundland and Labrador	255	36.2	9.5	27.2	30.0	33.3	6.2	1.5	1.9
Prince Edward Island	79	34.9	7.0	21.9	46.2	24.9	4.5	0.7	1.8
Nova Scotia	453	36.0	8.3	21.4	41.0	29.4	6.3	0.7	1.3
New Brunswick	385	34.3	5.4	19.7	48.7	26.2	3.7	0.8	1.0
Quebec	4,379	38.1	16.2	15.0	35.1	33.7	9.9	4.0	2.2
Ontario	7,206	33.2	9.6	35.7	37.0	17.6	5.2	1.4	3.0
Manitoba	644	35.3	6.7	14.9	55.0	23.3	4.7	0.7	1.3
Saskatchewan	567	34.3	3.9	15.3	64.4	16.4	1.8	0.2	1.9
Alberta	2,437	31.6	4.3	25.8	56.5	13.4	2.3	0.6	1.4
British Columbia	2,564	30.9	4.7	45.6	34.3	15.5	1.8	0.4	2.4
AGE GROUPS									
18-24	2,642	19.1	3.0	61.6	26.8	8.6	1.0	0.6	1.4
25-34	4,365	35.1	9.2	26.9	44.7	19.1	4.6	1.8	2.8
35-44	4,202	39.0	15.4	17.4	39.2	28.0	8.9	3.1	3.4
45-54	4,172	37.0	9.4	21.0	44.3	25.4	5.9	1.6	1.9
55-64	3,586	34.6	7.3	29.5	42.1	21.0	4.6	0.7	2.0
55-64 (with pension income)	838	35.1	5.5	35.6	39.2	19.7	3.7	0.3	1.5
GENDER									
Men	9,819	35.1	10.0	25.9	39.1	25.1	6.3	1.5	2.2
Women	9,149	33.0	8.8	32.0	41.8	17.4	4.3	1.8	2.6
IMMIRANT STATUS									
Not Immigrant	14,316	33.9	8.8	28.4	41.2	21.7	5.2	1.4	2.1
Recent Immigrant (< 10 yrs)	1,548	33.8	13.6	31.7	35.3	19.4	6.1	3.7	3.8
Not-Recent Immigrant	3,104	34.9	10.2	29.4	39.6	20.8	5.6	1.8	2.8

Table 2 (cont'd) – Average and distribution of EMTRs among 18-64 workers, by characteristics, 2017

CHARACTERISTICS	NB. (x1000)	EMTRs		DISTRIBUTION OF EMTRs					
		MEAN	50% EMTR or more	Under 30%	30- 39%	40- 49%	50- 59%	60- 69%	70% or more
HIGHEST EDUCATION									
Less than HS	1,459	32.5	11.5	34.7	36.6	17.3	5.4	2.1	4.0
High School (HS)	5,158	29.7	7.6	40.1	36.5	15.8	3.8	1.6	2.2
More than HS	6,195	36.2	10.3	23.2	43.8	22.7	5.9	2.0	2.3
University Degree	6,156	36.0	9.5	23.7	41.2	25.7	6.1	1.3	2.2
STUDENT STATUS									
Not Student	16,117	36.5	10.1	23.5	42.9	23.5	5.8	1.8	2.5
Full-Time Student	2,151	16.4	4.0	67.6	21.6	6.8	1.8	0.9	1.3
Part-Time Student	700	32.4	9.0	32.4	41.3	17.3	4.7	2.2	2.1
TYPE OF WORKER									
Salaried	17,550	34.2	9.2	28.3	41.1	21.4	5.2	1.7	2.4
Self-Employed Only	1,418	32.1	11.7	36.0	31.7	20.6	7.0	2.1	2.6
INTENSITY OF WORK									
Part-Year Worker	5,663	28.6	10.0	43.8	32.3	13.9	4.7	1.9	3.5
Full-Year, Part-Time Worker	1,657	29.9	10.0	43.5	33.1	13.5	3.7	1.7	4.6
Full-Year, Full-Time Worker	11,647	37.3	9.0	19.5	45.4	26.1	5.9	1.6	1.5
POSITION IN THE FAMILY									
Unattached	7,579	29.0	7.3	39.5	37.2	16.0	3.3	1.7	2.4
Main Income Recipient (MIR)	6,196	39.6	13.4	14.6	39.7	32.3	9.0	2.1	2.3
Secondary Income (SIR)	5,193	34.8	7.6	30.3	46.1	16.1	4.0	1.2	2.4
PRESENCE OF KIDS									
Yes	6,047	41.2	19.1	12.6	35.1	33.2	11.5	3.9	3.7
No	12,921	30.7	4.8	36.5	42.9	15.8	2.5	0.6	1.7
FAMILY CIRCUMSTANCES									
Unattached Without Kids	6,908	27.7	4.6	41.4	39.2	14.8	1.9	0.9	1.8
Unattached With Kids	671	42.3	35.1	19.4	16.5	29.0	17.7	9.5	7.9
Couple With Kids, MIR	2,903	43.7	21.7	4.8	32.1	41.4	14.5	4.0	3.2
Couple With Kids, SIR	2,473	38.0	11.7	19.8	43.8	24.6	6.3	2.3	3.2
Couple Without Kids, MIR	3,293	36.0	6.2	23.3	46.4	24.2	4.1	0.5	1.6
Couple Without Kids, SIR	2,720	31.9	3.8	39.8	48.1	8.3	1.8	0.3	1.7

Source: Author's calculations using Statistics Canada's SPSP/M, v. 27.0.

It is also interesting to note that the average EMTR of working men (35.1%) was above that of working women (33.0%), and that a similar pattern was observed with respect to the proportions of men and women with EMTRs of 50% or more (10% versus 8.8%). Examining more carefully the distribution of EMTRs by gender suggests that women were slightly more likely than men to face EMTRs of 60% or more – likely due to their slightly more important reliance on transfers⁶, but also more likely to face EMTRs below 40% – likely due to their generally lower personal income. Men, in turn, were more likely to face EMTRs in the 40-60% range.

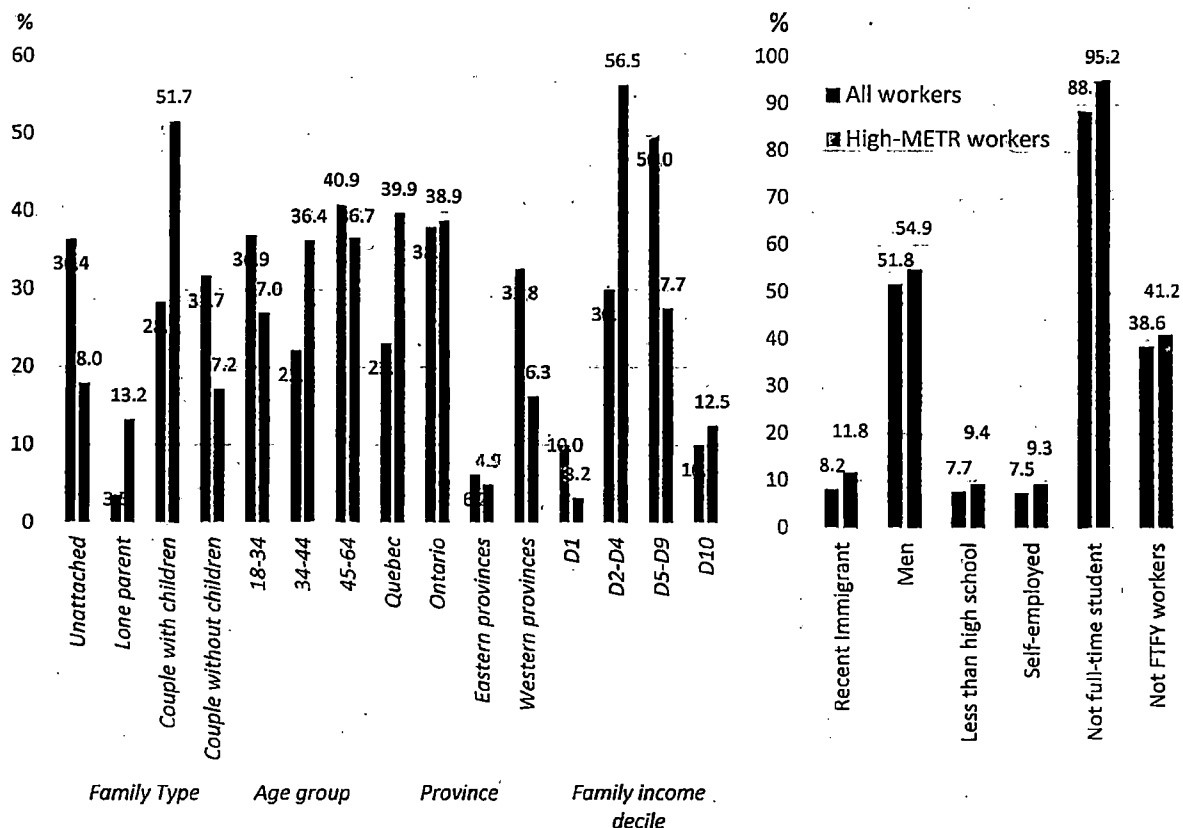
⁶ In 2017, 75.7% of working women were part of a family which received at least \$1 in federal transfers in comparison to 72.8% of working men. A similar gender difference was observed with regards to provincial transfers (57.0% of women versus 54.5% of men).

On the other end, average EMTR and the proportion of workers with an EMTR of 50% or more were especially low among young workers (i.e., those aged 18-24 years) and/or full-time students.⁷

6. Main Causes of "High EMTRs"

While most workers would have retained the bulk of an additional \$1,000 in labour income, about 9.4% of them (or 1.7 million) would have faced an EMTR of 50% or more. The previous section identified some characteristics that are associated with higher average EMTRs and larger shares of high EMTRs (i.e., EMTRs equal or higher than 50%) among all workers. However, it did not denote the extent to which the specific high-EMTR population possesses those characteristics since it depends on how common these characteristics are in the overall working population. To better understand the causes of high EMTRs, this section examines the prevalence of such characteristics among the group of individuals actually facing high EMTRs.

Charts 6-7 – Share of individuals with specific characteristics among high-EMTR workers in comparison to among all workers (including high-EMTR workers), 2017



Source: Author's calculations using Statistics Canada's SPSPD/M, v. 27.0.

⁷ Regression analyses confirmed the various relationships underlined in this section between characteristics of workers and the higher/lower probability they have of facing an EMTR of 50% or more.

In comparison to all workers, Charts 6 and 7 show that high-EMTR individuals are more likely to be single parents or part of couples with children. They are also more likely to have an adjusted family income between \$15,500 and \$42,200 (deciles 2, 3 and 4) or to be in the top 10% of the income distribution (decile 10), and more likely to live in Quebec, to be aged 35 to 44 years, or to be recent immigrants. Further, the prevalence of men, individuals with less than a high school diploma, self-employed, and part-time or part-year workers is somewhat more important among this group.

Table 3 shows that among individuals with high EMTRs, there is an overrepresentation of workers with total personal income in the first federal PIT bracket (15%) or in the top bracket (33.0%). In addition, compared to all workers, workers facing high EMTRs are less likely to have reached the maximum CPP/QPP and EI/QPIP contribution thresholds (21.9% versus 30.2% in 2017). Finally, a much larger proportion relies on transfers, both from the federal (93.4% versus 72.2% for other workers) and provincial governments (82.7% versus 52.9%). In particular, a majority received CCB (60% versus 25.7%) and GSTC amounts (55.3% versus 36.3%) in 2017.

Table 3 – Distribution of all workers (in %), high-EMTR and low-EMTR workers, by characteristics, 2017

CHARACTERISTICS	All	High EMTRs	Low EMTRs
ALL 18-64	100.0	100.0	100.0
ACTUAL PERSONAL TOTAL INCOME			
Below the 2017 BPA (\$11,635)	9.7	4.5	10.2
Between \$11,635 and 45,916 (15.0% PIT rate)	42.8	45.2	42.6
Between \$45,916 and \$91,831 (20.5% PIT rate)	33.6	30.8	33.9
Between \$91,831 and \$142,353 (26.0% PIT rate)	9.8	6.4	10.1
Between \$142,353 and \$202,800 (29.0% PIT rate)	2.4	3.5	2.3
Above \$202,800 (33.0% PIT rate)	1.7	9.7	0.9
TOPPED UP MAX. CPP/QPP AND EI/QPIP CONTRIBUTIONS			
No	69.8	78.1	68.9
Yes	30.2	21.9	31.1
ANY BENEFIT FROM FEDERAL TRANSFERS			
No	25.8	6.6	27.8
Yes	74.2	93.4	72.2
ANY BENEFIT FROM PROVINCIAL TRANSFERS			
No	44.3	17.3	47.1
Yes	55.7	82.7	52.9
CCB RECEIPT			
No	71.1	40.0	74.3
Yes	28.9	60.0	25.7
GSTC RECEIPT			
No	61.9	44.7	63.7
Yes	38.1	55.3	36.3
WITB RECEIPT			
No	89.0	88.4	89.1
Yes	11.0	11.6	11.0
SA RECEIPT			
No	94.7	74.8	96.8
Yes	5.3	25.2	3.2

Source: Author's calculations using Statistics Canada's SPSP/M, v. 27.0.

In theory, a better understanding of the characteristics associated with high EMTRs and which government programs are involved can guide the development of approaches to ease the burden of EMTRs and encourage additional work.

According to Table 4, these represented 41.2% (or 733,300) of all high-EMTR individuals in 2017 (or 3.9% of all workers). Interestingly, unattached individuals, recent immigrants, full-time students, those aged 25-34 year and/or those with less than a high-school diploma were more strongly represented among this group. Conversely, this subpopulation of high-EMTR individuals was less largely composed of men, residents of Quebec, individuals aged 35 to 44 years and/or individuals living in families with children (although families with children still represented the most common family situation among this subpopulation).

Table 4 – Distribution of all workers (in %), all high-EMTR and subgroups of high-EMTR workers, by characteristics, 2017

CHARACTERISTICS	All workers	High EMTRs			
		All	Not working FTFY	50-60%	60% or more
All 18-64 (number x1,000)	18,968	1,781	733	1,013	768
Average employment income	\$48,700	\$67,700	\$32,900	\$99,600	\$25,600
PROVINCES					
Newfoundland and Labrador	1.3	1.4	1.7	1.6	1.1
Prince Edward Island	0.4	0.3	0.4	0.4	0.3
Nova Scotia	2.4	2.1	2.6	2.8	1.2
New Brunswick	2.0	1.2	1.3	1.4	0.9
Quebec	23.1	39.9	32.8	42.9	35.8
Ontario	38.0	38.9	37.4	36.8	41.7
Manitoba	3.4	2.4	2.9	3.0	1.7
Saskatchewan	3.0	1.2	1.7	1.0	1.5
Alberta	12.9	6.0	9.0	5.6	6.4
British Columbia	13.5	6.7	10.3	4.6	9.5
AGE GROUPS					
18-24	13.9	4.4	6.7	2.6	6.8
25-34	23.0	22.5	27.2	19.7	26.3
35-44	22.2	36.4	29.4	36.9	35.6
45-54	22.0	21.9	19.5	24.4	18.7
55-64	18.9	14.8	17.2	16.4	12.6
GENDER					
Men	51.8	54.9	48.0	60.8	47.1
Women	48.2	45.1	52.1	39.2	52.9
IMMIRANT STATUS					
Not Immigrant	75.5	70.4	67.6	73.5	66.3
Recent Immigrant (< 10 yrs)	8.2	11.8	15.5	9.3	15.1
Not-Recent Immigrant	16.4	17.9	16.9	17.2	18.7

Table 4 (cont'd) – Distribution of all workers (in %), all high-EMTR and subgroups of high-EMTR workers, by characteristics, 2017

CHARACTERISTICS	All workers	High EMTRs (i.e., EMTRs of 50% or more)			
		All	Not working FTFY	50-60% EMTRs	EMTRs of 60% or more
HIGHEST EDUCATION					
Less than HS	7.7	9.4	13.1	7.8	11.5
High School (HS)	27.2	22.0	25.2	19.3	25.5
More than HS	32.7	35.7	34.5	36.1	35.2
University Degree	32.5	33.0	27.1	36.9	27.8
STUDENT STATUS					
Not Student	85.0	91.7	85.2	93.0	90.0
Full-Time Student	11.3	4.8	10.3	3.8	6.1
Part-Time Student	3.7	3.5	4.5	3.3	3.9
INTENSITY OF WORK					
Part-Year Worker	29.9	31.9	77.5	26.0	39.7
Full-Year, Part-Time Worker	8.7	9.3	22.5	6.0	13.6
Full-Year, Full-Time Worker	61.4	58.8	0.0	68.0	46.7
FAMILY CIRCUMSTANCES					
Unattached	36.4	18.0	25.6	13.0	24.5
Lone parent	3.5	13.2	11.3	11.7	15.2
Couple With Kids	28.4	51.7	42.0	56.9	44.7
Couple Without Kids	31.7	17.2	21.1	18.3	15.6
ACTUAL PERSONAL TOTAL INCOME					
Below the 2017 BPA (\$11,635)	9.7	4.5	8.4	3.2	6.2
Between \$11,635 and 45,916 (15% PIT rate)	42.8	45.2	63.7	31.7	63.0
Between \$45,916 and \$91,831 (20.5% PIT rate)	33.6	30.8	20.4	32.8	28.3
Between \$91,831 and \$142,353 (26.0% PIT rate)	9.8	6.4	2.5	9.8	1.9
Between \$142,353 and \$202,800 (29.0% PIT rate)	2.4	3.5	1.4	5.8	0.3
Above \$202,800 (33.0% PIT rate)	1.7	9.7	3.7	16.8	0.3
TOPPED UP MAX. CPP/QPP AND EI/QPIP CONTRIBUTIONS (Yes)	30.2	21.9	8.8	33.7	6.4
ANY BENEFIT FROM FEDERAL TRANSFERS (Yes)	74.2	93.4	97.6	89.9	98.1
ANY BENEFIT FROM PROVINCIAL TRANSFERS (Yes)	55.7	82.7	90.9	70.9	98.1
CCB RECEIPT (Yes)	28.9	60.0	51.9	60.5	59.5
GSTC RECEIPT (Yes)	38.1	55.3	69.4	37.8	78.4
WITB RECEIPT (Yes)	11.0	11.6	19.5	6.7	18.1
EI RECEIPT (Yes)	17.6	24.0	37.2	22.1	26.6
SA RECEIPT (Yes)	5.3	25.2	44.5	7.1	49.1
ADJUSTED FAMILY INCOME DECILES					
D1 (15,537 or less)	10.0	3.2	7.0	1.5	5.6
D2-D4 (15,538 to 42,193)	30.0	56.5	68.3	42.1	75.5
D5-D9 (42,194 to 114,569)	50.0	27.7	19.1	35.8	17.1
D10 (114,569 or more)	10.0	12.5	5.6	20.6	1.9

Note: In tables 3 and 4, "total income" refers to the sum of all market income and transfer income, not to total income for tax purposes. This approach, combined with the focus on workers aged 18 to 64 years, explains why a smaller than usual proportion of individuals is found in the first tax bracket.

Source: Author's calculations using Statistics Canada's SPSP/M, v. 27.0.

In comparison to all high-EMTR workers, those who did not work FTFY in 2017 were more highly concentrated in the bottom 4 deciles (75% versus 60% among all high-EMTR and 40% among all workers) and were more likely to make use of government transfers, either federal or provincial transfers. They were especially likely to have received employment-insurance (EI), WITB, GSTC and SA payments. As Table 5 shows, if all individuals in this specific high-EMTR subpopulation had increased their earnings by \$1,000 in 2017, they would have retained only \$297 on average of this additional \$1,000, mainly due to reductions in transfer amounts. While the loss in provincial transfers is considerably more important than that in federal transfers, among all federal transfers, it is the reduction in CCB that would have played the most important role in offsetting additional earnings.

Table 5 – Average loss in transfers (by sources) and additional taxes owed (\$) following a \$1,000 rise in labour income among all Workers aged 18-64, by level of EMTRs and work intensity, 2017

Average changes in \$	All workers	EMTRs below 50%	High EMTRs (i.e., EMTRs of 50% or more)			
			All	Not working FTFY	50-60% EMTRs	EMTRs of 60% or more
Average EMTR	34.1%	30.9%	64.5%	70.2%	53.8%	78.7%
Federal PIT	-146	-144	-158	-121	-193	-113
Provincial PIT	-99	-96	-130	-87	-156	-96
Federal transfers	-23	-16	-90	-82	-80	-104
WITB	-2	-1	-8	-9	-6	-11
CCB	-17	-13	-58	-49	-55	-63
GSTC	-3	-2	-13	-11	-10	-17
Others	-2	-1	-11	-13	-9	-14
Provincial transfers	-28	-9	-210	-343	-61	-406
SA	-16	-1	-153	-290	-23	-324
Others	-12	-7	-57	-52	-38	-82
Combined Payrolls	-45	-44	-58	-70	-48	-70
Total	-341	-309	-646	-703	-538	-789

Note: Results may not always add up due to rounding.

Source: Author's calculations using Statistics Canada's SPSPD/M, v. 27.0.

Further, a closer look at the characteristics of high-EMTR individuals revealed two distinct types of profiles. The first type is the profile of workers for whom EMTRs fall between 50% and 60% (Tables 4 and 5, second last column). These represented 56.9% of the high-EMTR population in 2017. This 50-60% EMTR group had an average personal employment income about four times higher than that of other high-EMTR workers (\$99,600 versus \$25,600). Their total income was also significantly more likely to fall in the highest federal PIT bracket (33%). They were also less likely to be social assistance recipients, recent immigrants and students, but more likely to be men and full-time workers. For this high-EMTR group, 65% of the income loss generated by the application of tax and transfer systems is the result of additional taxes payable on earnings (Table 5). The second type is made of the remaining 43.1% workers facing EMTRs of 60% or more (Tables 4 and 5, last column). In comparison, this type comprises a very large share of social assistance recipients (about 50%) and has a family income that is much lower on average. More than 80% of this group had an

adjusted family income in the first four deciles (i.e., below \$42,193), while among the 50-60% EMTR group, this proportion was just above 40%. It should also be noted that, while this last high-EMTR group included a non-negligible proportion of FTFY workers (47%), its profile was more similar to that of the previously-described subpopulation of high-EMTR workers who did not work FTFY in 2017 than that of the 50-60% EMTR group.

7. Conclusion

EMTRs are useful concepts since they provide indications on the extent to which incentives to increase the intensity of work are reduced by the tax and transfer systems. For individuals and families, the anticipation of not being much better-off or even being worse-off after an increase in earnings may represent a disincentive for taking on extra work.

Using actual survey data, this note estimates that the 19 million Canadian workers aged 18 to 64 in 2017 faced an average EMTR of 34.1%, implying that \$341 of an additional \$1,000 in earnings would have been offset by taxes or lost benefits. The distribution of EMTRs indicates that a large majority of Canadian workers would have retained the most part of additional earnings in 2017. However, it also shows that around 9.4% of them (or 1.7 million) would have faced an EMTR of 50% or more, implying that they would have retained less than half of any additional labour income.

An examination of the characteristics associated with high EMTRs suggests that there is no single profile of high-EMTR workers. However, two groups stand out among them. The first is made of individuals facing EMTRs in the 50-60% range and for whom PIT systems largely explain their high EMTRs. The second group is made of individuals facing EMTRs above 60% and for whom the impact of transfers is generally more significant, especially the impact of social assistance claw backs which considerably reduce the gains from additional earnings.

Among federal transfers, the CCB contributes the most to offsetting the benefits of earning more for high-EMTR workers. The CCB impact is, however, not as important as the offsetting impacts of the federal PIT system and payroll deductions.

Annex A: Methodology

A.1 Definitions of Effective Marginal Tax Rates (EMTRs) and Participation Tax Rates (PTRs)

EMTRs on labour income refer to the financial penalty in terms of lost benefits and increased taxes and social contributions that are encountered by working individuals who are receiving additional earnings (through extra work hours or increase in wages). PTRs refer to the financial penalty encountered by individuals who are entering the labour force. The penalty can differ depending on whether individuals enter the labour force to work part or full-time as well as on the level of earnings they can get.

Arithmetically, EMTRs and PTRs on labour income can be derived for each individual using the following formula:

$$\text{Rate}_i = 1 - [\text{Increase in disposable income}_f / \text{increase in labour income}_i],$$

where subscripts *i* and *f* denote respectively to the individual receiving labour income increment and to the family⁸ of this individual.

In general, EMTRs/PTRs fall between 0 and 100%. However, they can be above 100% when the total disposable income loss exceeds the total labour income gain. They can also be below 0% when the total disposable income improvement exceeds the total labour income gain. A high EMTR/PTR means that a high percentage of the individual's labour income gain is offset by lost tax and transfer benefits for his or her family. A low EMTR/PTR means that the individual's family retains a high percentage of his or her labour income gain after the application of the tax and transfer system.

In Canada, the distribution of EMTRs and PTRs depends on multiple factors, including the various provisions of the federal and provincial tax systems (e.g., statutory income tax rates, deductions and credits) and the various government income transfers paid to eligible individuals or families. It is also the result of payroll taxes on earnings that workers have to pay to finance the Canada Pension Plan (CPP) or the Québec Pension Plan (QPP) as well as the Employment-Insurance (EI) and the Quebec parental insurance plan (QPIP) programs⁹.

EMTRs or PTRs can be hard to predict for individuals. Two individuals with similar level of personal income may face considerably different EMTRs/PTRs depending on their income situation, personal characteristics and/or family circumstances. Personal income taxes, payroll taxes and government assistance (through tax expenditures and government transfers) vary considerably based on personal and/or family income, and may only be available to individuals with specific characteristics (e.g., seniors, those

⁸ In the current analysis, the concept of family refers to nuclear family which is defined as unattached individuals or members of couples with their children under the age of 18. This family concept is the closest to the one used by the Canada Revenue Agency (CRA) to determine entitlement to family tax measures.

⁹ Payroll taxes only refer to the employees' contributions, i.e., they do not include those paid by employers to finance these programs.

with children, those who are working). Also, the income of both spouses in a couple may be impacted by a rise in labour income of one of them due to some federal and provincial benefits based on family income. Therefore, the estimation of EMTRs or PTRs for individuals requires considering the change in their family disposable income that may result from a change in their personal labour income. It is worth noting that the change in family disposable income may differ depending on which spouse receives the labour income increment in the family (e.g., the impact may differ depending on where the income of the individual receiving the labour income increment falls in the tax rate structure, and on whether the individual has already topped up maximum annual CPP/QPP contributions and EI/QPIP premiums).

When EMTRs/PTRs are calculated for each individual in a given population, they can be aggregated to represent the actual distribution of EMTRs and PTRs in the economy, and to better understand the characteristics of the groups facing high EMTRs/PTRs. As an illustration, Annex B provides concrete examples of EMTRs calculation for three hypothetical individuals.

A.2 Data Source and Methodology

To derive individuals' EMTRs, this project uses the "Marginal Tax Rate" facility of the Statistics Canada's Social Policy Simulation Database/Model (SPSD/M) version 27.0 for the 2017 tax year. This facility can simulate the impact on income after taxes, transfers and payroll deductions of an increase in employment income for each individual of interest.

Given that SPSPD/M only produces EMTRs when the sources of income incremented are SPSPD/M base income variables, total employment income could not be incremented at once. Paid-employment income and self-employment income had to be incremented separately. Further, while social assistance income is included in SPSPD/M data, this source of income does not affect the calculation of SPSPD/M's EMTRs, meaning that increasing labour income does not decrease social assistance. Hence, using the SPSPD/M facility most likely underestimates the real EMTRs values for social assistance recipients. For more accurate estimates for this group, some adjustments to social assistance amounts were needed before estimating EMTRs¹⁰. Annex C provides details on the methodology used for estimating social assistance income adjustments.

¹⁰ Only tax and transfer programs which are modelled in the SPSPD/M are accounted for in the Marginal tax rate facility. These exclude provincial social assistance programs for which some adjustments were applied in the current analysis, but also the tax shield for workers which was introduced in Quebec in 2016 as well as all in-kinds benefits offered to lower-income individuals or families such as subsidized housing or child care.

Annex B: Demonstration of EMTRs calculation

This simulation estimates EMTRs for three hypothetical Ontarian workers: the main and secondary working spouse in a couple with two kids and an unattached individual without kids, supposing no income other than employment and transfer income, and a taxable income that is equivalent to total income.

Baseline: Situations of each individual before implementing \$1,000 labour income increments

			Income, by sources				Taxes and social contributions					Disposable income	
ID	Fam type	Sex	Emp.	Fed. Transf.	Prov. Transf.	Total	Fed. taxes	Prov. taxes	Fed. payrolls	Prov. payrolls	Total taxes	Ind.	Fam.
1	Couple with kids	M	80,000	0	200	80,200	12,000	5,000	3,460	0	20,460	59,740	78,040
2	Couple with kids	F	15,000	4,500	0	19,500	100	0	1,100	0	1,200	18,300	78,040
3	Unat.	M	50,000	0	0	50,000	5,500	3,700	3,000	0	12,200	37,800	37,800

Notes: \$3,640 was about the maximum EI and CPP contribution in 2017. Taxes and payrolls amounts were approximated based on the 2017 tax return data and structure. CCB amounts were approximated using the federal CCB calculator.

First simulation: The main income recipient in the couple receives the \$1,000 increment.

			Income, by sources				Taxes and social contributions					Disposable income	
ID	Fam type	Sex	Emp.	Fed. Transf.	Prov. Transf.	Total	Fed. taxes	Prov. taxes	Fed. payrolls	Prov. payrolls	Total taxes	Ind.	Fam.
1	Couple with kids	M	81,000	0	200	81,200	12,200	5,150	3,460	0	20,810	60,390	78,630
2	Couple with kids	F	15,000	4,440	0	19,440	100	0	1,100	0	1,200	18,240	78,630
3	Unat.	M	50,000	0	0	50,000	5,500	3,700	3,000	0	12,200	37,800	37,800

Second simulation: The secondary income recipient in the couple receives the \$1,000 increment.

			Income, by sources				Taxes and social contributions					Disposable income	
ID	Fam type	Sex	Emp.	Fed. Transf.	Prov. Transf.	Total	Fed. taxes	Prov. taxes	Fed. payrolls	Prov. payrolls	Total taxes	Ind.	Fam.
1	Couple with kids	M	80,000	0	200	80,200	12,000	5,000	3,460	0	20,460	59,740	78,680
2	Couple with kids	F	16,000	4,440	0	20,440	250	50	1,200	0	1,500	18,940	78,680
3	Unat.	M	50,000	0	0	50,000	5,500	3,700	3,000	0	12,200	37,800	37,800

Third simulation: The unattached individual receives the \$1,000 increment.

			Income, by sources				Taxes and social contributions					Disposable income	
ID	Fam type	Sex	Emp.	Fed. Transf.	Prov. Transf.	Total	Fed. taxes	Prov. taxes	Fed. payrolls	Prov. payrolls	Total taxes	Ind.	Fam.
1	Couple with kids	M	80,000	0	200	80,200	12,000	5,000	3,460	0	20,460	59,740	78,040
2	Couple with kids	F	15,000	4,500	0	19,500	100	0	1,100	0	1,200	18,300	78,040
3	Unat.	M	51,000	0	0	51,000	5,700	3,800	3,075	0	12,575	38,425	38,425

Comparing the first and second simulation shows that, because CCB amounts are based on family net income, the decrease in federal transfer income received by the two-parent couple is equivalent regardless of whose spouse is receiving the \$1,000 labour income increment (a CCB reduction of about 60\$ annually in both cases). On the

other hand, this comparison also shows that the increase in total taxes paid by the couple varies depending on whose spouse is receiving the labour income increment (a rise of \$350 when the main income recipient is receiving the income increment compared with a \$300 rise when the receiver is the secondary income recipient). The difference is explained by the fact that the main income spouse is taxed at higher PIT rates and had topped up the maximum payroll deduction thresholds before the labour income increment.

By comparing each simulation to the baseline scenario, an EMTR for each individual can be derived (i.e., by looking at the variations between the simulation scenarios 1, 2 and 3 and the baseline scenario).

EMTRs calculation for each hypothetical individual receiving a labour income increment

Individual	Δ in family disposable income (A)	Δ in personal employment income (B)	Individual EMTRs =1-[A/B]
1	\$590	\$1,000	41.0%
2	\$640	\$1,000	36.0%
3	\$625	\$1,000	37.5%

Overall, individuals' EMTRs suggest that the three hypothetical individuals would have retained more than 50% of an extra \$1,000 in personal labour income in 2017. However, they also suggest that the net gain from working more would have been more important for individual 2, followed by individual 3 and then by individual 1. Indeed, after the consideration of the tax and transfer systems, individual 1 would have retained the smallest proportion (59%) of an additional \$1,000 in labour income while individual 2 would have retained the highest proportion (64%).

Annex C: Estimating EMTRs among SA recipients

All provincial SA programs have their own parameters, including their own earnings exemption rules (i.e., specific levels of employment income permitted before SA payments start to be reduced) and maximum levels of SA benefits which, in most cases depends on family circumstances and employability status. Basic information on provincial SA rules that applied in 2017 is provided in the table below. This information, excerpted from provincial Government websites and confirmed by social policy analysts in Employment and Social Development Canada, was determined with the assistance of colleagues in the Personal Income Tax Division.

Province	Unattached			Couple		
	Maximum annual basic and additional SA benefits (\$)*	Maximum monthly net earnings exemption (\$)	Exemption Rate*** [ex_RATE]	Maximum annual basic and additional SA benefits (\$)	Maximum monthly net earnings exemption (\$)	Exemption Rate [ex_RATE]
NEWFOUNDLAND AND LABRADOR**	10,596 without kids and 15,192 with kids	75 without kids 150 with kids	0.2	15,936 without kids and 15,768 with kids	150	0.2
PRINCE EDWARD ISLAND	6,924 without kids and 15,768 with kids	75 without kids 125 with kids	0.1	12,708 without kids and 18,048 with kids	125	0.1
NOVA SCOTIA	6,900 without kids and 10,740 with kids	150	0.3	13,440 without kids and 14,040 with kids	150 per earner	0.3
NEW BRUNSWICK**	6,444 without kids and 11,328 with kids	150 without kids and 200 with kids	0.3	10,836 without kids and 11,940 with kids	200	0.3
QUEBEC	8,136 without kids and 9,132 with kids	200	0.0	11,664 without kids and 12,672 with kids	300	0.0
ONTARIO	8,652 without kids and 12,480 with kids	200	0.5	13,416 without kids and 13,260 with kids	200 per earner	0.5
MANITOBA	9,396 without kids and 15,763 with kids	200	0.3	12,407 without kids and 14,760 with kids	200 per earner	0.3
SASKATCHEWAN**	6,996 without kids and 11,592 with kids	200 without kids and 125 with kids	0.0	13,164 without kids and 14,652 with kids	275 without kids and 125 with kids	0.0
ALBERTA	7,524 without kids and 11,964 with kids	230	0.25	11,472 without kids and 14,604 with kids	115 per earner	0.25
BRITISH-COLUMBIA**, ****	8,520 without kids and 13,632 with kids	200 without kids and 400 with kids	0.0	11,724 without kids and 14,412 with kids	400	0.0

Notes: *These are the values for persons considered employable as the objective is the current report is to study the impact of intensifying labour market participation. In some provinces, maximum SA benefits are higher for non-employable individuals (disabled).

**In these provinces, particular earnings exemptions apply to the disabled population. Those were not accounted for in the present analysis as persons with disabilities are not identifiable in SPSP/M.

***Exemption rate means that welfare benefits are reduced by a given percentage for every dollar earned above the monthly earnings exemption.

****In British-Columbia, the maximum monthly family earnings exemption has been increased on October 1st, 2017, rising values to \$400 and \$600.

As an example, in the case of an unattached SA recipient living in Ontario and receiving \$300 a month in SA while earning an additional \$300 in labour income, the first \$200 in net earnings would be exempted, meaning that it would not impact SA benefits. On the next \$100, another \$50 would be exempted $((300-200)*0.5)$. In total, it is \$50 (\$300-250\$) that would be clawed back from his/her \$300 SA cheque. So, by working, this SA recipient would get a total of \$550 in income (\$300 in net earnings plus \$250 in SA income) compared with a total of \$300 if not working.

The information presented in the previous table can be used to derive the basic annual earnings exemptions that applied in 2017 or, in other words, the amount of annual earnings entitlement that was allowed before SA amounts started to be reduced [EARN_ex], as well as the annual earnings cap or, in other words, the amounts of earnings at which SA would have most likely been entirely be clawed back, i.e., equal to 0 [EARN_cap]. These amounts are presented in the following table by province and family circumstances in 2017.

Province	Unattached		Unattached with 2 kids		Couple without kids		Couple with 2 kids	
	Annual earnings exemption [EARN_ex]*	Annual earnings cap [EARN_cap]**	Annual earnings exemption [EARN_ex]	Annual earnings cap [EARN_cap]	Annual earnings exemption [EARN_ex]	Annual earnings cap [EARN_cap]	Annual earnings exemption [EARN_ex]	Annual earnings cap [EARN_cap]
NEWFOUNDLAND AND LABRADOR	915	16,000	1,830	23,000	1,830	24,000	1,830	24,000
PRINCE EDWARD ISLAND	915	10,000	1,525	21,000	1,525	17,000	1,525	24,000
NOVA SCOTIA	1,830	13,000	1,830	19,000	1,830	23,000	1,830	24,000
NEW BRUNSWICK	1,830	9,000	2,440	15,000	2,440	14,000	2,440	15,000
QUEBEC	2,445	12,000	2,445	13,000	3,770	17,000	3,770	18,000
ONTARIO	2,440	24,000	2,440	31,000	2,440	36,000	2,440	39,000
MANITOBA	2,440	13,000	2,440	14,000	2,440	17,000	2,440	16,000
SASKATCHEWAN	2,440	10,000	1,525	14,000	3,355	18,000	1,525	17,000
ALBERTA	2,805	14,000	2,805	20,000	1,405	18,000	1,405	22,000
BRITISH-COLUMBIA	3,050	15,000	7,485	23,000	3,050	18,000	7,485	23,000

Notes: * The annual gross earnings exemption [EARN_ex] variable was derived by multiplying by 12 the monthly net earnings exemption, and then by adding the amounts of CPP/QPP contributions and EI/QPIP premiums taken from such labour income. In 2017, the EI premium rate for employees was 1.25% plus the 0.548% for QPIP in Quebec and 1.62% in the rest of Canada (RoC). There is no basic exemption amount on EI/QPIP premiums. The CPP/QPP contribution rate was 5.4% in Quebec and 5.1% in RoC with a \$3,500 basic exemption amount in both places. In this analysis, the annual earnings exemption has been rounded to the highest tenth.

** The annual earnings cap [EARN_cap] was derived by solving the following formula:

$Y_{p,t} = X_{p,t} - (Z - (W_{p,t} + (Z - W_{p,t}) * V_{p,t}))$, where Y=Estimated SA amounts, X=Maximum annual basic and additional SA benefits, Z= earnings amounts, W=Annual earnings exemption and V=Exemption rate; for each individual living in province p and being part of family type t. The annual earnings cap has been rounded to the highest thousand.

Using the information presented in the last two tables, the "most likely" SA income change (or SA claw back) that would have resulted from a \$1,000 increase in labour income for each worker who relied on SA in 2017 can be estimated. However, because provincial SA earnings exemption rules apply on a monthly basis while SPSPD/M income information is provided on an annual basis, assumptions with regard to the simultaneity of being in receipt of SA and earning labour income also have to be applied for estimating SA income changes. Indeed, if SPSPD/M identifies which individuals receive both SA and employment incomes during the year, it does not specify whether the earnings and SA periods coincide or not. For example, an individual who has accumulated \$3,000 in SA income at the beginning of the year and \$12,000 in labour income during the remaining part of the year, would show up in SPSPD/M data exactly the same as another individual who has simultaneously accumulated \$3,000 in SA income and \$12,000 in labour income throughout the year. However, because of SA rules, it can be expected that the SA payments of these two individuals would have been impacted differently by a \$1,000 labour income increment (the first would most likely not be impacted while the second would be), and accordingly, assumptions with regard to the simultaneity of SA and labour income need to be selected. SPSPD/M provides information on the labour market status of individuals (i.e., whether employed people worked full-time/part-time or full-year/part-year) which facilitates the development of plausible assumptions in that regard.

For individuals who report full-year employment (those represented 51.2% of SPSPD/M working SA recipients in 2017), the most plausible assumption is that the periods of SA and labour income receipt coincide during the year, and as such, that SA claw back rules would most likely apply following a rise in labour income. Hence, for this population, the following formula was used to estimate individuals' SA claw backs:

- If ($\text{immemp} \geq \text{EARN_ex}$) then $\text{clawback} = 1000 * (1 - \text{ex_RATE})$;
- If ($\text{immemp} \leq \text{EARN_ex}$ and $_ \text{immemp} > \text{EARN_ex}$) then $\text{clawback} = (_ \text{immemp} - \text{EARN_ex}) * (1 - \text{ex_RATE})$;
- If ($_ \text{immemp} \leq \text{EARN_ex}$) then $\text{clawback} = 0$,

Where "immemp" is the individual's actual level of gross labour income (i.e., labour income before payroll deductions) before the \$1,000 earnings increment and " $_ \text{immemp}$ " is the individual's level of gross labour income after the \$1,000 labour income increment.

However, in cases where full-year employment was reported in conjunction with actual levels of labour income above the amounts at which SA income should have been fully recovered (i.e., SA amounts above the annual earnings cap), it was considered that the most plausible assumption was that SA amounts were independent from labour income amounts and, as such, that \$0 claw backs applied:

- if $\text{immemp} \geq \text{EARN_cap}$) then $\text{clawback} = 0$.

For individuals who do not report full-year employment, it is more difficult to determine whether SA and earnings periods coincide or not. Accordingly, for this population, two scenarios were tested:

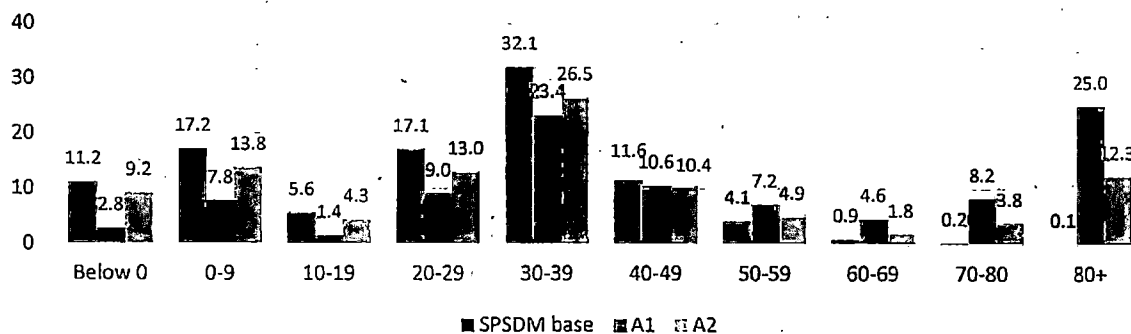
A1: Earnings and SA periods coincide for all workers regardless of their labour market status, and the above-described SA claw back formula applies to all of them.

A2: Earnings and SA periods coincide for full-year workers and the above-described SA claw back formula applies to them, but for the rest of workers (i.e., part-year workers) earnings and SA periods do not coincide and a \$0 claw back applies.

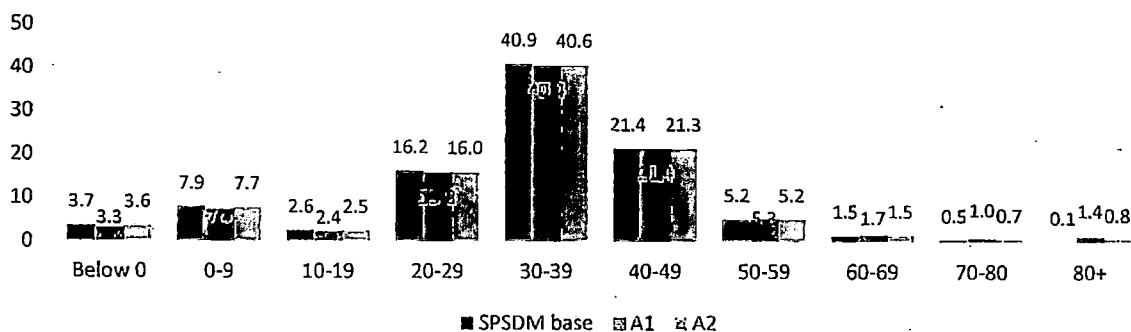
The table and charts below compare the average SA claw backs, average EMTRs as well as the distribution of EMTRs that are produced using SPSPD/M (i.e., when increasing labour income does not decrease social assistance) to those produced when SA income is adjusted according to assumptions A1 and A2.

	SA population					Non-SA population		Full population	
	% with \$0 claw back	% with \$1,000 claw back	Average claw back (\$)	Average EMTR (%)	% with EMTRs > 50%	Average EMTR (%)	% with EMTRs > 50%	Average EMTR (%)	% with EMTRs > 50%
SPSPD/M	100.0	0.0	0	23.7	5.3	33.0	7.3	32.5	7.1
A1	51.6	10.9	309	53.5	44.9	33.0	7.3	34.1	9.4
A2	79.3	4.1	128	35.9	22.7	33.0	7.3	33.1	8.2

All SA workers, 2017



All workers, 2017



Source: Author's calculations using Statistics Canada's SPSPD/M, v. 27.0.

It is worth noting that, if the assumptions used for adjusting SA amounts following labour income increments has a non-negligible impact on the distribution of EMTRs among SA recipients, it does not have a significant impact on the distribution of EMTRs among all Canadian workers as only a minor share relies on SA.

References

Alexandre Laurin (January 2018), "Two-Parent Families with Children: How Effective Tax Rates Affect Work Decisions", E-Brief, C.D. HOWE Institute.

Finance Canada's Personal Income Tax Division internal work on METRs derived on the basis of hypothetical scenarios.

Office of the Assistance Secretary for Planning & Evaluation – U.S. Department of Health and Human Services, Suzanne Macartney and Nina Chien (March 2019), "Marginal Tax Rates: A Quick Overview", Brief#1 in ASPE Marginal Tax Rate Series.

Office of the Assistance Secretary for Planning & Evaluation – U.S. Department of Health and Human Services, Suzanne Macartney and Nina Chien (March 2019), "What Happens when People Increase their Earnings? Effective Marginal Tax Rates for Low-Income Households", Brief#2 in ASPE Marginal Tax Rate Series.

Office of the Assistance Secretary for Planning & Evaluation – U.S. Department of Health and Human Services, Linda Giannarelli, Kye Lippold, Elaine Maag, C. Eugene Steuerle, Nina Chien and Suzanne Macartney (March 2019), "Estimating Marginal Tax Rates Using a Microsimulation Model: Technical Appendix", Brief#5 in ASPE Marginal Tax Rate Series.

Statistics Canada (December 2018), "User's Guide", Social Policy Simulation Database/Model (SPSD/M) Version 27.0. Catalogue no. 89F0002X.

Statistics Canada (December 2018), "Variable Guide", Social Policy Simulation Database/Model (SPSD/M) Version 27.0, Catalogue no. 89F0002X.