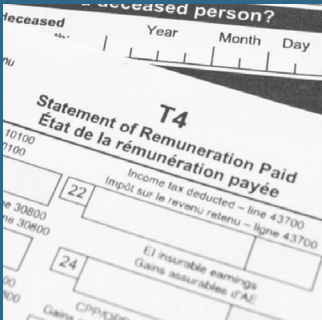


Revenue Effects of Tax Rate Changes in Alberta



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Executive Summary

- As recently as 2014, Alberta enjoyed a significant tax advantage, which included a single 10% personal income tax (PIT) rate, the lowest in Canada. However, in 2015, the newly elected NDP government introduced a progressive five-bracket PIT system with a top rate of 15%, eroding Alberta's tax advantage.
- Alberta's top combined provincial and federal PIT rate is 48%, ranking it the tenth highest in North America. As well, its tax competitiveness is lower, compared with other energy-producing regions.
- The main objective of this study is to examine the revenue implications of replacing Alberta's current five-bracket PIT system with a single rate of 8%. The study analyzed three alternative reform scenarios: Immediate transition to an 8% single rate starting in 2025, gradual transition to 8% over three years, ending in 2027, and an immediate 20% across-the-board tax reduction in the current five-bracket system in 2025.
- After accounting for the positive behavioural effects of reduced taxes, this study finds that if Alberta immediately switches to a single 8% PIT rate, PIT revenue would drop by \$6.1 billion (a 35.6% reduction) in the first year. Gradual transition to a single 8% rate would initially reduce revenue by \$264 million (1.5%), rising to \$6.9 billion (a 37.0% decline) by 2027. In contrast, an immediate 20% across-the-board cut in the current PIT system would reduce provincial revenue by \$5.1 billion (a 29.5% drop) in 2025.
- This study may overestimate provincial revenue losses, as it does not account for potential positive economic effects of PIT reductions on other revenue sources.

Introduction

Alberta has in the past prided itself as having an overall tax advantage relative to the rest of Canada. As recently as 2014, the province offered a highly competitive tax environment. Not only was it the only province in Canada without a provincial retail sales tax, it also levied a single personal income tax (PIT) rate of 10%, the lowest in the country. Additionally, Alberta boasted the lowest corporate income tax rate. The province's tax policy changed in 2015, when the newly elected NDP provincial government raised the corporate income tax rate (CIT) from 10% to 12%, and replaced the single PIT rate with a five-bracket system.¹ As a result of this policy change, Alberta's provincial top marginal PIT rate jumped from 10% to 15% in 2015, eroding the province's tax advantage.² Alberta now has the tenth highest top marginal personal income tax rate in North America, and its tax competitiveness ranking, particularly when compared with similar energy-based North American jurisdictions, is lower.³

Several researchers and commentators have argued that Alberta should reintroduce the single income tax rate system to improve the province's tax competitiveness. For example, a recent article by Hill and Li (2024) discusses the potential benefits of replacing Alberta's current five-bracket PIT system with a single rate of 8%.⁴ They argue that this would significantly reduce the tax burden on Albertans and improve Alberta's tax advantage. Indeed, if Alberta cut its PIT rate, it would strengthen its tax advantage and help attract talent and investment to the province. The mobility of high-skilled labour and businesses to the province would increase overall economic activities and benefit Albertans significantly. Detractors of tax rate cuts, however, express concerns about the potential revenue losses associated with lower tax rates. Thus, assessing the revenue impacts of tax rate cuts is vital to enabling a well-informed public policy discussion of these critical issues in the province.

1 Because of the corporate income tax rate (CIT) cuts by the Jason Kenney government in 2019 and 2020, Alberta's CIT rate is 8%.

2 The federal PIT rates are on top of the provincial rate, and the combined provincial and federal PIT rates jumped to 48% following the 2016 tax rate hike by the federal government.

3 See studies such as Eisen, et al. (2017), Lafleur, et al. (2019), and Eisen and Hill (2020) on the decline in Alberta's tax advantage.

4 The Smith government introduced a new 8% bottom PIT rate effective January 1, 2025 (Alberta, 2025).

The main objective of this study is to examine the effects of cutting PIT rates on provincial government revenue in Alberta. The study investigates the revenue implications of replacing Alberta's current five-bracket PIT system with a single rate of 8%. In doing so, it contributes to the policy debate surrounding the need for PIT reductions in the province. The revenue analysis that follows focuses on an 8% PIT rate for several reasons. First, it is the same as the current 8% general CIT rate and equality between the provincial CIT and PIT rates mirrors Alberta's historical experiences before the 2015 tax rate hikes. Second, during the 2023 provincial election campaign, the province's United Conservative Party (UCP)—the governing party—promised to reduce the PIT rate for all Albertans whose taxable income was below \$60,000 to 8% by creating a new tax bracket. Thus, introducing a single PIT rate of 8% can be seen as an expansion of this tax rate cut promise to all Albertans in all tax brackets.

This study considers two scenarios for moving Alberta's PIT system from the current five-bracket to a single rate of 8%, beginning in 2025. In the first scenario, it is assumed that the provincial government will immediately eliminate the various income tax brackets and institute a single tax rate of 8% in 2025. In the second scenario, a policy reform in which the provincial government gradually introduces the single tax rate of 8% over the three years ending in 2027 is considered. In addition, the study assesses the revenue implications of a third scenario, where the five-bracket PIT system is maintained and the tax rates are reduced by 20% across the board, so the provincial income tax rate for Albertans in the lowest tax bracket would drop to 8%.⁵

The impacts of tax rate cuts on government revenue depend on the size of the tax rate reductions and taxpayers' behavioural responses to lower marginal rates. Some theoretical and empirical studies have found that tax rate cuts raise the incentive to work, save, and invest, ultimately increasing the tax base. Thus, if positive behavioural responses of taxpayers occur due to tax rate reductions, the resulting revenue loss is typically lower than the predictions of critics of tax rate cuts. This has led empirical researchers to focus on estimating taxpayers' behavioural responses to tax rate changes. In this regard, some studies employ individual-level data and focus on evaluating the elasticity of taxable income, which measures the response of taxable income to changes in the net-of-tax rate (i.e., one minus the tax rate). Studies such as Lindsey (1987), Feldstein (1995), Goolsbee (1999, 2000), Gruber and Saez (2002), Saez (2003), and Giertz (2007), among others, obtain a wide range of taxable income elasticity estimates using data from the

5 This scenario is similar to the, on average, 25% across-the-board PIT cuts that British Columbia's provincial government introduced in 2001.

US.⁶ Canadian studies such as Sillamaa and Veall (2001) and Milligan and Smart (2015, 2019) also obtain a variety of behavioural responses from taxpayers.

Researchers in another group of empirical studies focus on using aggregate-level data to analyze the behavioural effects of tax rate changes. This strand of the literature estimates the taxable income semi-elasticity, which measures the percentage change in taxable income associated with a one percentage point change in the tax rate. For example, using aggregate-level data, Canadian studies such as Dahlby and Ferede (2012, 2018), Ferede (2019, 2020), and US studies such as Haughwout (2004), have estimated taxable income semi-elasticity. For Alberta, an empirical study by Ferede (2021) finds that the province's total taxable income short-run semi-elasticity for the top marginal PIT rate is - 0.64. This suggests that a one percentage point reduction in the province's top marginal PIT rate will lead to an increase in the province's total taxable income by about 0.64%. The revenue analysis of this study uses this tax base semi-elasticity estimate for Alberta to incorporate the taxpayers' behavioural responses.

The dynamic revenue analysis of this study shows that if the provincial government immediately moves to a single income tax rate of 8%, the resulting revenue loss will be about \$6.1 billion in 2025, the first year of the tax reform. Compared with the baseline scenario of no tax rate cuts, this revenue loss would be equivalent to a decrease in PIT revenue of 35.6%. Under the alternative scenario, where the provincial government is assumed to move to a single rate of 8% gradually, the revenue loss would be about \$264 million in 2025, the first year of the reform, rising to about \$6.9 billion in 2027, which is the last year of the tax reform. To put these revenue losses into context, relative to the baseline scenario with no tax reform, the PIT revenue decline would be approximately 1.5% in 2025, gradually increasing to 37% by 2027. Finally, if the Alberta government cuts the PIT rates across the board by 20%, the dynamic revenue analysis of this study finds that the revenue loss in the first year of the tax reform would be about \$5.1 billion, or roughly a 29.5% drop in PIT revenue relative to the baseline scenario. This revenue loss grows over time, reaching about \$6.2 billion in the fifth year.

The study is organized as follows. The first section provides background information about the personal income tax system in Alberta. In the following two sections the effects of alternative PIT rate cuts on provincial revenue are discussed. The last section is the conclusion.

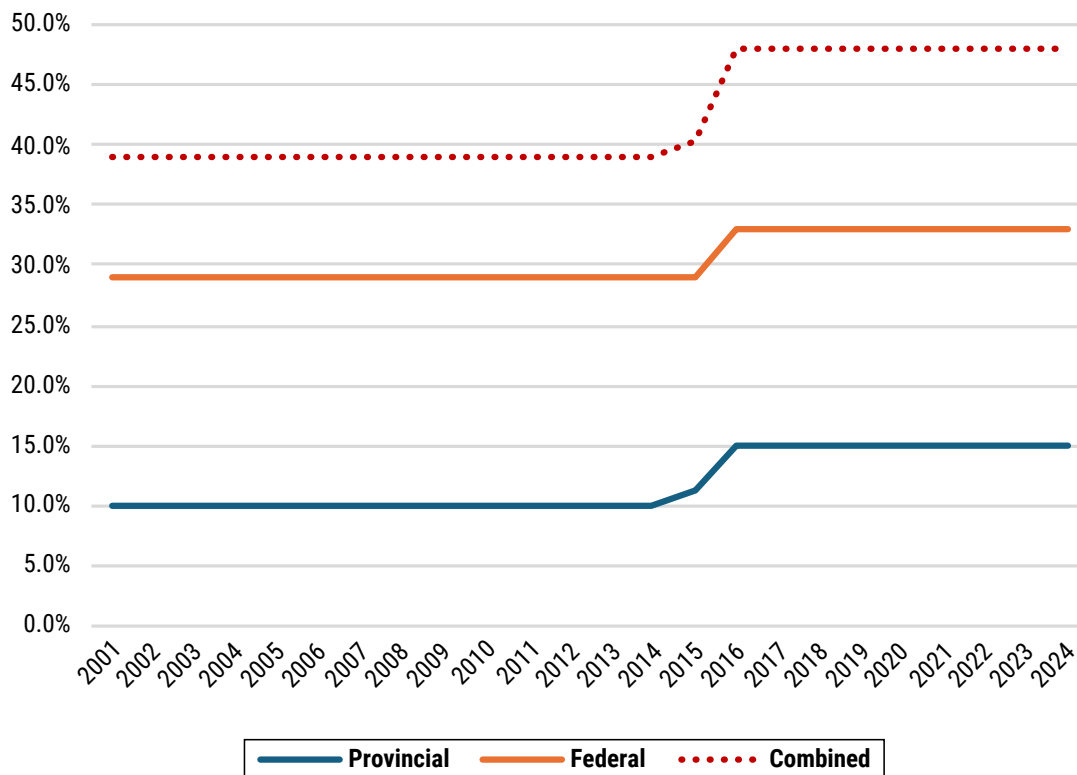
6 Saez et al. (2012) provide an excellent survey of the literature on taxable income elasticity.

Background

In the past, Alberta had the lowest provincial PIT in Canada, at a single rate of 10%, and it has long been the only province that does not use a provincial retail sales tax.⁷ Alberta also had the country's lowest general corporate income tax rate until 2014.

The evolution of Alberta's top PIT rate is shown in figure 1. As this figure shows, the province's single income tax rate of 1% was in place between 2001 and 2014.

Figure 1: Top Provincial and Federal Marginal PIT Rates (in percent), 2001–2024



Source: Canada Revenue Agency (2024).

⁷ During this period, Alberta's 10% general corporate income tax (CIT) rate was one of the lowest in the country. The NDP government raised the CIT rate to 12% in 2015 and introduced multiple tax brackets for the PIT rate system. The 2020 tax reform introduced by the Jason Kenney government cut reduced the province's CIT rate to the current 8%.

The absence of a provincial retail sales tax, and having the country's lowest PIT and general corporate income rates, provided the province with a significant tax advantage (often referred to as "the Alberta advantage)." This tax policy environment changed markedly in 2015, when the NDP provincial government abolished the single PIT system and introduced multiple tax brackets with higher income tax rates. As a result of this policy change, Alberta's marginal top PIT rate jumped from 10% to 15% by 2015, and the province's tax advantage was eroded as a result.⁸ This PIT system is still in effect. Further, the federal government hiked its top marginal PIT rate from 29% to 33% in 2016. Currently, the combined provincial and federal top marginal PIT rate in Alberta is 48%.

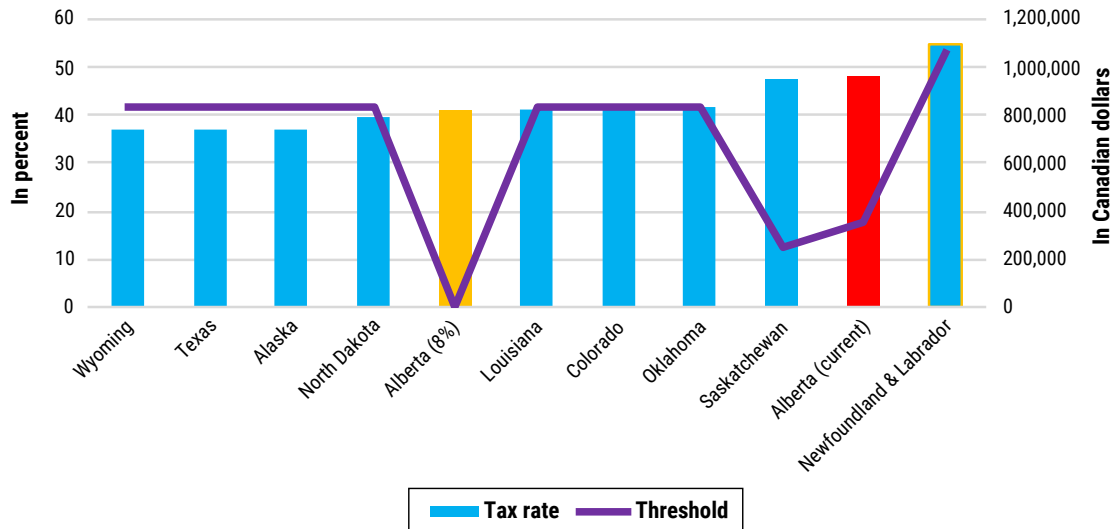
How does Alberta's PIT environment compare with its peers in North America? As Eisen and Hill (2020), Hill and Li (2024) and others have discussed in detail, Alberta's tax competitive advantage was severely reduced by the provincial and federal PIT rate changes introduced after 2014. It now has the second lowest top marginal PIT rate in Canada, but the tax rate is much higher than the corresponding top marginal income tax rates in all the US states, so Alberta has lost ground on tax competitiveness in North America. With a combined provincial and federal top PIT rate of 48%, Alberta has the tenth-highest marginal top income tax rate in North America.

The energy sector is the backbone of Alberta's economy, and a significant part of the province's employment and investment is related to activity in this sector. Thus, comparing the province's income tax competitiveness with similar energy-based jurisdictions in North America would, arguably, provide better insight into the province's relative tax advantage. Figure 2 shows the top marginal PIT rates of energy-producing North American jurisdictions. The tax rates represent combined federal and province/state top marginal PIT rates. For Alberta, we show the ranking with the current PIT rate and an alternative scenario, where the province moves to a single tax rate of 8%. To visualize the true PIT burden gap, we also show the taxable income threshold beyond which the top marginal PIT rates apply.

Figure 2 shows that the combined federal and provincial top marginal income tax rate in Alberta is 48%. It also shows that compared with other energy-based economies in North America, Alberta's top PIT rate is the second highest (only Newfoundland and Labrador's rate is higher). Further, Alberta's top PIT rate starts from a lower income threshold than do comparative jurisdictions in North America, which makes Alberta's tax rate even more burdensome for taxpayers. As figure 2 shows, Alberta's current top PIT rate applies to annual taxable income of \$355,845 and above. In comparison, in the

⁸ The NDP government also raised the CIT rate from 10% to 1%.

Figure 2: Top Combined Marginal PIT and Threshold Income, Energy-Producing US States and Canadian Provinces, 2024



Note: We use the 2024 average annual exchange rate between US dollars and Canadian dollars obtained from the Bank of Canada to convert the threshold income of US states into Canadian dollars.

Source: Canada Revenue Agency (2024); Yushkov (2024).

US states and in Newfoundland and Labrador, the application of the top income tax rates does not start until taxable incomes exceed \$834,688 and \$1,059,000, respectively.⁹ As shown in figure 2, if Alberta moved to a single tax rate of 8%, which matches the province’s current general CIT rate, its tax competitiveness would improve and its relative ranking would rise. Note that the single rate of 8% applies to all taxable income levels, so the threshold income level is zero in the figure.

⁹ We use the annual exchange rate from the Bank of Canada to convert the threshold income of US states from US to Canadian dollars.

Revenue Effects of Moving to a Single PIT Rate

In this section, we investigate the revenue effects of replacing Alberta's current five-bracket PIT system with a single tax rate of 8%. In our revenue analysis, we consider two scenarios. In the first scenario (scenario 1), we assume that the provincial government immediately eliminates the various income tax brackets and institutes a single tax rate of 8% in 2025. In the second scenario (scenario 2), we consider an alternative policy reform in which the provincial government gradually introduces the single tax rate of 8% over three years, ending in 2027. More specifically, as shown in table A2 in the appendix, scenario 2 assumes that the government will eliminate the two top income tax brackets in 2025, and then eliminate the remaining tax brackets in 2026, ending the tax reform in 2027 by reducing the marginal income tax rate from 10% to 8%.

The provincial government's PIT revenue depends on the size of the taxable income base and the applicable tax rates. Thus, tax rate changes impact government revenue from the tax source. In the literature, two ways of assessing the revenue effects of tax rate changes are often employed. The first approach is known as *static analysis*. Static revenue analysis assumes that taxpayers' behaviour remains unchanged in response to tax rate changes and, as a result, the tax base remains constant. In this case, one can calculate the revenue impacts of tax rate changes solely based on the immediate effects of tax rate changes, ignoring any possible impact on the economy. Of course, when a government cuts tax rates and applies the new lower tax rates to the same constant taxable income level, it collects less revenue—assuming there are no changes in taxpayer behaviour. Thus, the static revenue effect of tax rate cuts is mechanically negative, implying a revenue loss associated with tax rate cuts.

Tax rate cuts often incentivize working, saving, and investing, thereby increasing economic activities and expanding the tax base. Thus, taxpayers would respond positively to tax rate cuts, which increases taxable income and the revenue from the tax source. The second method of revenue analysis, known as *dynamic revenue analysis*, explicitly accounts for taxpayers' responses to tax rate changes and provides a more accurate picture of the real-world effects of tax rate changes. This study relies on this approach to shed light on the possible revenue impacts of moving Alberta's PIT system to a single rate of 8%. The analytical framework employed in the revenue analysis of this study is presented and discussed in the appendix. The appendix also outlines the parameter

values assumed in the revenue simulation in Table A1, so only the overall results of the dynamic revenue analysis are presented here.

Tables 1 and 2 show the potential revenue effects associated with the provincial government's move to a single PIT of 8%. Note that due to our assumption on the modality and timing of the tax reform, the revenue effects of PIT rate cuts under the two scenarios differ only in the first two years of the reform. Beginning in 2027, however, the last year of the reform, the impacts of the tax rate cuts on the government PIT revenue are identical under the two scenarios, since the single rate of 8% is assumed to be in place in both scenarios beginning in that year.

Table 1: Static Revenue Effects of an Immediate Move to a Single PIT Rate (millions of dollars), Scenario 1, 2025–2029.

	2025	2026	2027	2028	2029
Static Effects	-7257	-7729	-8170	-8602	-9055
Behavioural responses	1135	1197	1256	1314	1374
Dynamic Effects	-6122	-6532	-6914	-7288	-7681

Notes: The dynamic effects are the sum of the static effects and behavioural responses.

Source: Author's calculations.

Table 2: Static Revenue Effects of a Gradual Move to a Single PIT Rate (millions of dollars), Scenario 2, 2025–2029.

	2025	2026	2027	2028	2029
Static Effects	-588	-2201	-8170	-8602	-9055
Behavioural responses	324	855	1256	1314	1374
Dynamic Effects	-264	-1346	-6914	-7288	-7681

Note: The dynamic effects are the sum of the static effects and behavioural responses.

Source: Author's calculations.

We first turn our attention to the results of the static revenue analysis. The second rows of tables 1 and 2 report the static revenue effects under scenarios 1 and 2, respectively. As discussed above, the negative numerical values indicate that the provincial government's PIT revenue falls due to the tax rate cuts. Recall that we assume the tax reform ends in 2027 and, as a result, the two scenarios provide similar revenue effects for 2027 and onward. The analysis suggests that the revenue losses associated with Alberta's

PIT rate cuts under scenario 1 would be about \$7.3 billion, \$7.7 billion, and \$8.2 billion in the first three years of the reform, respectively. Under scenario 2, where the government gradually implements the move to the single rate of 8% over the three years, the static revenue losses would be \$0.6 billion, \$2.2 billion and \$8.2 billion in 2025, 2026, and 2027, respectively. These revenue losses are arguably significant and grow over time as the taxable income base grows with the economy. These estimated revenue losses highlight the possible budgetary challenges associated with the tax rate cuts considered under the two scenarios.

This discussion is, however, based on the very unrealistic assumption that taxpayers do not respond to significant tax rate changes, and that the taxable income base is wholly unaffected by the tax rate cuts. Generally, tax rate cuts incentivize taxpayers to work, save, and invest more, thus boosting overall economic activity. In addition, tax rate cuts can discourage tax evasion and avoidance, which also increases the tax base and affects government revenue positively. Several Canadian studies, such as Sillamaa and Veall (2001), Dahlby and Ferede (2012, 2018), Milligan and Smart (2019), as well as international studies such as Gruber and Saez (2002) and Goolsbee (1999, 2000) (as surveyed by Saez et al., 2012), find empirical evidence that taxpayers respond positively to tax rate cuts, and the taxable income base rises when the tax rates are reduced. Therefore, the static revenue analysis discussed above does not provide a complete picture of the revenue effects of tax rate changes, as it ignores the positive behavioural responses of taxpayers associated with the tax rate cuts.

A relatively more realistic way of assessing the revenue effects of tax rate changes is by incorporating taxpayers' behavioural responses to tax rate cuts. In the literature, the behavioural response of taxpayers associated with tax rate cuts is most commonly captured by the critical parameter known as *tax base semi-elasticity*, which shows the percentage change in taxable income due to a one percentage point cut in the tax rate. Some empirical studies thus focus on estimating the tax base semi-elasticities, using data from various jurisdictions. In the Canadian context, Dahlby and Ferede (2018) estimate taxpayers' long-term behavioural responses to changes in the provincial top PIT rate for each province, including Alberta. They obtain a long-run semi-elasticity of total taxable income with respect to the top PIT rate of -2.22.¹⁰ For Alberta, Ferede (2021) finds a short-run taxable income semi-elasticity of total taxable income with respect

10 Ideally, we would have liked to incorporate the behavioural responses associated with the changes in all the tax rates. However, this is not feasible, as the available semi-elasticity is related to the top PIT rate. Besides, it would be empirically difficult to estimate taxbase semi-elasticities with respect to the tax rates in other tax brackets using aggregate data, as the tax brackets and associated tax rate change over time.

to the top PIT rate of about -0.64, which implies that a one percentage point cut in the provincial top PIT rate is associated with a 0.64% increase in total taxable income in the short-term. Thus, we believe, as previous studies have concluded, that a short-term tax base semi-elasticity estimate is more relevant for computing the year-to-year changes in revenue caused by the suggested Alberta tax rate cuts. To calculate the revenue effects caused by the positive behavioural responses associated with the PIT rate cut, this study uses the short-term tax-base semi-elasticity estimate obtained by Ferede (2021).¹¹ The revenue effects caused by the behavioural responses are shown in the third rows in tables 1 and 2.

As we have indicated, an increase in taxable income due to taxpayers' positive behavioural responses could increase tax revenue, so the government could recoup part of the revenue loss caused by the tax rate cuts. The third rows of tables 1 and 2 show that the revenue effects due to positive behavioural responses are positive. Note that, over time, as taxable income grows over time with the economy, the revenue effects associated with the behavioural responses also rise. Table 1 shows that, under scenario 1, the revenue gain associated with the PIT rate cut and positive behavioural taxpayers' responses is about \$1.1 billion in the first year, and has grown to \$1.4 billion by the fifth year of the tax reform. Under scenario 2, the revenue gain amounts to \$324 million in the first year, and has grown to \$1.4 billion by the fifth year after the start of tax rate cuts in 2025. Thus, the government can recoup some of the revenue loss caused by the tax rate cuts, due to positive behavioural responses and the increase in economic activity following the tax reform.

The foregoing discussion underlines the importance of considering the behavioural responses of taxpayers, and the possible effects of tax rate changes on economic activity and their impacts on government revenue. Thus, a more reliable assessment of medium- and longer-term budgetary implications of tax rate cuts should incorporate taxpayers' behavioural responses. Not surprisingly, some researchers argue that revenue analysis

11 In Dahlby and Ferede (2018), the long-run taxable income semi-elasticity estimate for Alberta is -2.89, and in Ferede (2021), the short-run taxable income semi-elasticity estimate for the province is -0.64. Based on these two studies, one can conclude that the long-run elasticity estimate takes about 5 years to be fully effective. While using the short-run elasticity estimate is very useful to obtain the year-to-year changes in revenue, as this and other similar studies have done, one can also use the long-run elasticity estimate to compute the revenue effects in the long run. One can easily show that the revenue effects computed using the long-run elasticity estimate would be comparable with the cumulated revenue effects obtained using the short-run estimate.

and projections should be based on the method of dynamic revenue analysis by incorporating taxpayers' behavioural responses to the tax rate changes. See, for instance, Laurin (2012, 2018). Dynamic revenue analysis provides estimates of the total revenue impacts of tax rate changes, by including the direct negative revenue effects caused by PIT rate cuts (as shown by the static effects), and the positive revenue effects associated with the behavioural responses of taxpayers. In tables 1 and 2, the last rows show the dynamic revenue effects of the PIT rate cuts for Alberta under the two scenarios. Table 1 shows that, under scenario 1, the dynamic revenue effects of the PIT rate cuts amount to a revenue loss of about \$6.1 billion in 2025, the first year of the tax reform.¹² Compared with the baseline scenario of no tax rate cuts—the revenue the government is projected to collect in the absence of any PIT rate changes—this revenue loss is equivalent to a decrease in PIT revenue of about 35.6%.

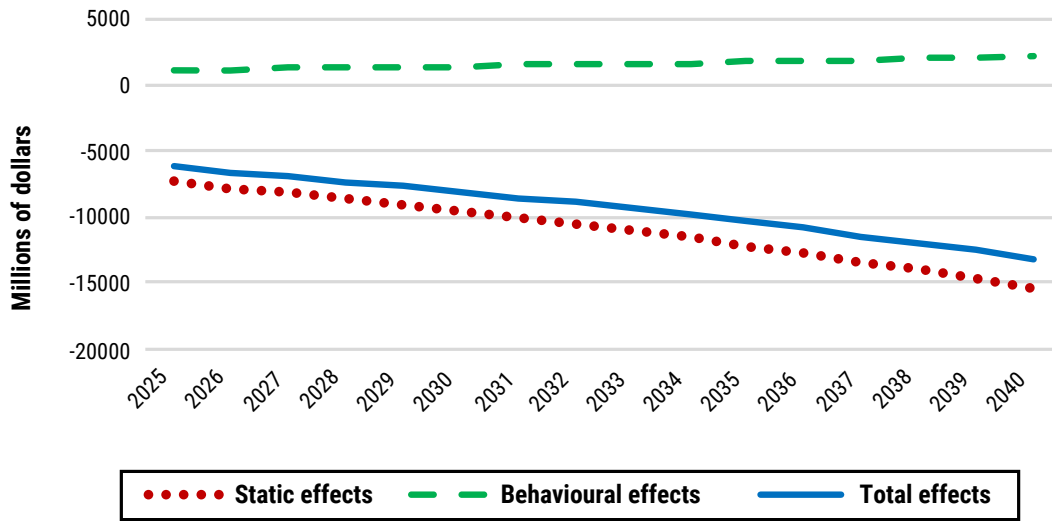
Table 2 shows that under scenario 2, the revenue loss associated with the PIT rate cuts based on dynamic revenue analysis amounts to about \$264 million in 2025, at the beginning of the reform, and grows to \$6.9 billion in 2027, the last year of the tax reform. To put these revenue losses in perspective, one can compare the revenue losses with those in the baseline revenue estimate. Accordingly, compared with the baseline PIT revenue that the government would be projected to collect in the absence of tax rate changes, the decrease in the PIT revenue is equivalent to 1.5% in 2025, and will grow gradually to 37% in 2027, the last year of the reform.

So far, we have focused on discussing the effects of tax rate cuts on revenue during the reform period's first three years. As the economy grows, the revenue impacts would continue beyond the last year of the reform period. At this point, it may be useful to shed light on the medium-term and long-term trajectory of the revenue effects of tax rate reductions. To visualize the impacts of the tax rate cuts, we show the evolution of the revenue effects by separating the static and dynamic effects from 2025 to 2040. Figures 3 and 4 show the simulated revenue effects under scenarios 1 and 2, respectively.

In the figures, the PIT rate cuts' static and behavioural revenue effects are shown by the dotted and broken lines, respectively. The solid lines denote the dynamic revenue effects. As discussed before, while the static revenue effects are negative, suggesting revenue losses, the behavioural effects are positive, and indicate revenue gains associated with the positive behavioural responses of taxpayers. This leads to increases in taxable income and revenue. The net effect of the tax rate cuts is shown by the total effects, which

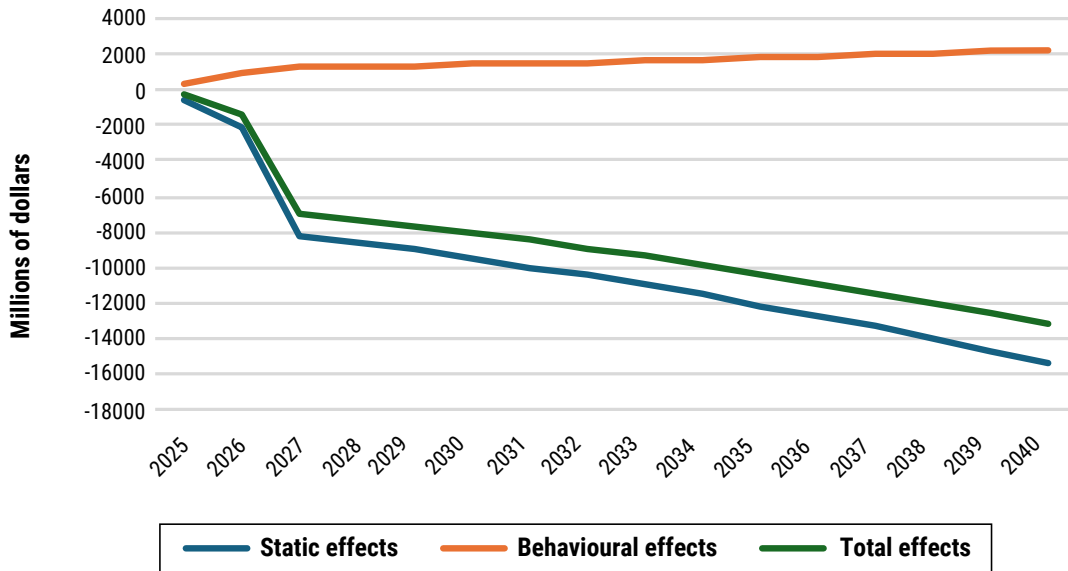
12 For some perspective, see the Government of Alberta's estimate that cutting the tax rate from the current 10% to 8% for those individuals with taxable income below \$60,000 alone would amount to about \$1.3 billion in the first year of the reform (Alberta, 2024a).

Figure 3: Simulated Revenue Effects of Alberta’s Immediate Move to a Single PIT Rate of 8% (Scenario 1), 2025–2040



Source: Author’s calculations. See the text for the method of the calculation.

Figure 4: Simulated Revenue Effects of Alberta’s Gradual Move to a Single PIT Rate of 8% (Scenario 2), 2025–2040



Source: Author’s calculations. See the text for the method of the calculation.

are negative and imply revenue losses. Note that the total effect of the tax rate cuts is obtained by summing the static and behavioural effects. As the figures show, the revenue losses associated with the tax rate cuts grow over time as the provincial taxable income base grows with the economy.

Perhaps one could better understand both the short-term and long-term impacts of the PIT rate cuts on the provincial government’s revenue by comparing the baseline revenue projections—assuming no tax rate changes—with the dynamic revenue projections under the two PIT rate reduction scenarios. Figure 5 shows these revenue projections for Alberta up to 2040.

We make some critical assumptions to compute the PIT revenue projections shown in Figure 5. First, to obtain the baseline revenue projections indicated by the solid line, we need to know the provincial government’s PIT revenue growth in the absence of

Figure 5: Alberta’s Total PIT Revenue Projections, Baseline and Scenarios 1 and 2, 2013–2040



Notes: The revenue values before 2025 correspond with actual PIT revenue collected by the provincial government. The revenues between 2025 and 2040 are obtained from our baseline projections and revenue simulations under the two scenarios.
 Source: Author’s calculations. See the text for the method of the calculation.

any tax rate change. According to the Government of Alberta (2024c), the PIT revenue for the fiscal year 2024-25 is forecast to be \$16,552 million. Thus, for the baseline revenue projection, we assume that provincial PIT revenue would grow from this level at an annual rate of 3.8%, which corresponds with the average annual growth rate of PIT revenue during the fiscal years 2015-16 to 2024-25, the period in which the multiple tax brackets were in effect.

The dotted line shows the revenue projection under scenario 1, where the provincial government is assumed to immediately move the PIT system to a single rate of 8%. Scenario 2 is shown by the broken line. Note that the revenue projections are obtained by summing the baseline revenue estimates and the total or dynamic revenue effects associated with the two scenarios. As discussed before, beginning in 2027, the revenue effects under Scenario 1 and Scenario 2 are the same, so the two revenue projections overlap. However, in the first two years of the reform, the revenue projections under scenario 2 are closer to the baseline than to Scenario 1, indicating a more significant revenue loss associated with the latter.

Revenue Effects of Across-the-Board PIT Rate Cuts

As discussed in the previous section, the dynamic revenue analysis for the potential PIT reform, where the Alberta government is assumed to move its PIT system to a single tax rate of 8%, results in significant revenue effects. Thus, given the sizeable revenue loss, one concern is that this tax reform may be challenging to implement, due to its sizeable budgetary implications.

To address this concern, we consider another tax rate reduction scenario (scenario 3), where the government is assumed to reduce the PITs for all tax brackets across the board by 20%. This tax reform is comparable with the (on average) 25% across-the-board income tax rate cuts the British Columbia provincial government introduced in 2001. In the revenue analysis, we choose a 20% tax rate reduction because, with such a reform, the income tax rate for the lowest tax bracket will be 8%, corresponding with the tax rate the Smith government promised to implement during the election campaign. See Table A2 in the appendix for the provincial PIT rates under this scenario. Note that with this tax rate cut scenario, Alberta will maintain the current multiple tax brackets and have the lowest tax rate for high-income earners in the country, with a top marginal provincial PIT rate of 12%.

As in the previous section, under scenario 3, we assume that the tax rate cuts occur in 2025. We report the revenue effects of this scenario in Table 3. The results are reported for the first five years, for brevity. The methodology of the revenue simulation is similar to that discussed in the previous section. Our static revenue analysis, which does not include the positive behavioural responses of taxpayers to lower tax rates, is shown in the second row. The results indicate that under scenario 3 the revenue loss would be about \$5.6 billion in the first year of the reform. This grows modestly over time as the taxable income rises with the economy, and amounts to about \$6.8 billion in the fifth year of the reform.

In the third row, we also report the revenue effects of the tax rate changes associated with the behavioural responses. The results indicate the behavioural responses under scenario 3 are lower than the corresponding responses in scenarios 1 and 2, because the reduction in the marginal tax rate for the top income bracket in scenario 3 is only three percentage points (compared with seven-percentage-point rate cuts in scenarios 1 and 2). Our calculation shows that, due to the positive behavioural responses of taxpayers, the government would gain about \$486 million in the first year. The amount of

Table 3: Revenue Effects of Across-the-Board PIT Rate Cuts (millions of dollars), Scenario 3, 2025–2029

	2025	2026	2027	2028	2029
Static Effects	-5553	-5873	-6174	-6469	-6779
Behavioural responses	486	513	538	563	589
Dynamic Effects	-5067	-5360	-5635	-5906	-6190

Source: Author's calculations.

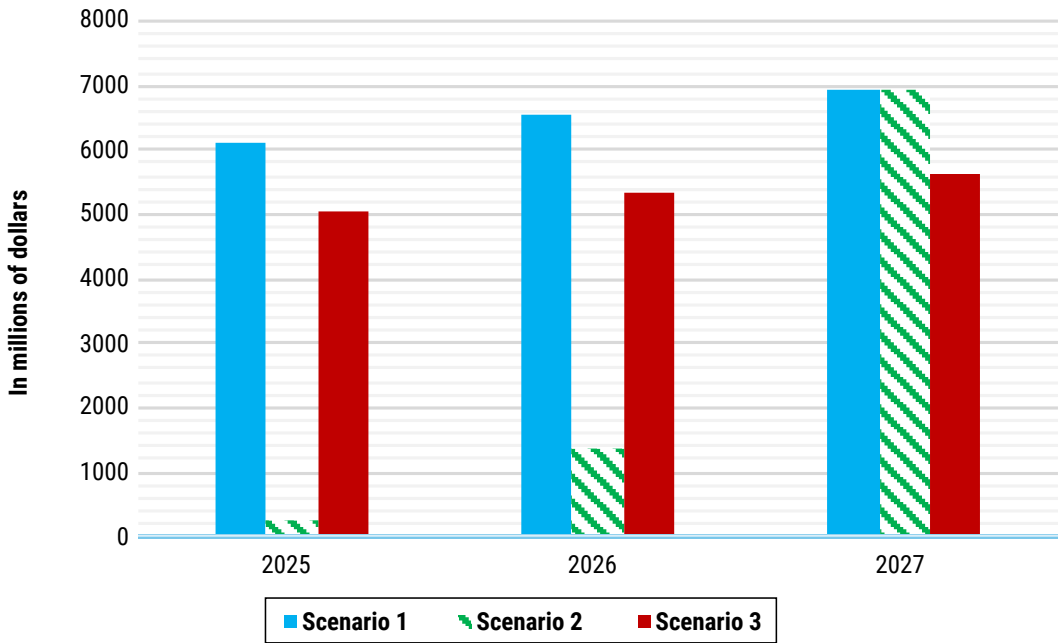
revenue the government recoups will grow over time, and reach about \$589 million by the fifth year of the reform.

As discussed before, a more realistic assessment of the revenue impacts of tax rate cuts needs to include both the mechanical reduction of revenue due to the rate cuts, as summarized by the static effects, and the positive revenue effects associated with taxpayers' positive behavioural responses. In the fourth row of Table 3, we present the dynamic revenue effects of across-the-board tax rate cuts. The results show that the revenue loss in the first year of the tax reform under scenario 3 is about \$5.1 billion, a roughly 29.5% drop in PIT revenue, compared with the baseline scenario of no-tax rate changes. This revenue loss also grows over time, reaching about \$6.2 billion by the fifth year. Note also that this reduction in the PIT revenue is lower than the corresponding results under scenarios 1 and 2.

To visualize the revenue implications of tax rate cuts, in Figure 6 we show the revenue effects of the PIT rate cuts under the three tax reform scenarios for the first three years of the tax reform. In the first two years, scenario 2 produces the lowest revenue loss. Beginning in 2027, however, the revenue effects of scenarios 1 and 2 become identical, and the revenue loss associated with these scenarios is higher than under scenario 3.

In sum, this analysis shows that revenue projections to assess the budgetary implications of tax rate cuts should incorporate their positive impacts on economic activity and the associated increase in taxable income. Critics of tax rate cuts often exaggerate the potential revenue losses, ignoring taxpayers' behavioural responses and the long-term positive impacts of rate cuts on tax competitiveness and the economy. Public policy discussions around the merits of tax rate reductions (and other tax reforms) should explicitly account for the positive impacts of tax policy changes on the economy, which would enable the government to recoup some of the revenue losses stemming from tax rate cuts. Nonetheless, the revenue simulations of this study show that if Alberta moves its current five-bracket PIT system to a single rate of 8% immediately, there would be a

Figure 6: Simulated PIT Revenue Loss under Scenarios 1-3, 2025-27



Source: Author's calculations.

sizeable reduction in the provincial PIT revenue. A more gradual approach to tax rate reductions would result in a less significant revenue loss during the initial year, but the revenue loss will increase as the tax cuts are phased in over the following two years.

Conclusions

This study investigates the provincial revenue effects of Alberta changing its five-bracket PIT system to a single rate of 8%. The study uses the dynamic revenue simulation method, incorporating taxpayers' behavioural responses into the analysis. In this regard, two alternative scenarios are considered. In the first scenario, the study analyzes how Alberta PIT revenue will be impacted if the provincial government immediately replaces the various income tax brackets with a single tax rate of 8% in 2025. In the second scenario, the study conducts a revenue simulation analysis that assumes the provincial government gradually moving to a single tax rate of 8% over three years. Further, the revenue effects of a third scenario, in which the provincial government cuts the PIT rates across the board by 20% (but retains the current five income tax brackets), are analyzed.

The dynamic revenue simulation analysis suggests that if Alberta's government immediately abolishes the current five-bracket PIT system and institutes a single income tax rate of 8%, provincial PIT revenue would decrease by about \$6.1 billion in the first year of the tax reform, which is about a 35.6% drop in the PIT revenue, compared with the baseline scenario of no tax rate cuts. Further, under the third scenario, where the provincial government gradually moves to a single rate of 8%, the PIT revenue reduction would be about \$264 million, or a 1.5% drop, relative to the baseline scenario in the first year of the reform, but then climbs to about \$6.9 billion, or 37%, compared with the baseline in 2027, the last year of the tax reform. Finally, if Alberta maintained its current multiple tax bracket system through a 20% across-the-board PIT rate cut, the result is a revenue loss in the first year of the tax reform of \$5.1 billion, a 29.5% reduction in revenue relative to the baseline scenario.

Some caveats regarding the revenue analyses reported in this study are in order. First, if the provincial government reduces the PIT rates, it could attract talent and businesses to the province. This could boost economic activity, and the government's revenue from other sources, such as corporate income tax and property taxes, could potentially increase. However, this study focuses only on PIT revenue and ignores the effects on other tax revenue sources of the province. For the first caveat, the revenue loss reported here may overstate the adverse effects of tax rate cuts on the provincial government's overall finances. Second, assessing the reductions in PIT revenues in the context of the province's overall revenues, its total expenditure, and the required overall budget balance adjustment, may be essential. This issue is, however, beyond the scope

of this study. Third, critics of tax rate cuts often focus on the fairness of the perceived reduction in the tax system's progressivity. As this study's main objective is to assess the revenue implications of the tax cuts, it does not address the distributional effects of the tax rate cuts. Finally, when taxable income increases due to the tax rate cuts, it also benefits the federal government, as its PIT revenue from the province would increase. Again, these issues are not analyzed in this study. Addressing these and other related issues might, however, be a fruitful avenue for future research.

Appendix 1: Analytical Framework

This study's main analytical framework employed for simulating the revenue effects of Alberta's potential PIT rate cuts is based on chapter 5 of Dahlby (2008), and draws heavily on similar studies such as Ferede (2021). As discussed before, Alberta currently has five personal income tax brackets, and the marginal tax rates range from 10% to 15%. As this study investigates the revenue implications of a PIT reform that impacts all taxpayers, it is essential to carefully consider how the revenue coming from each tax bracket changes due to the tax rate cuts. Thus, we outline the theoretical framework for dynamic revenue analysis below.

In any given year t , Alberta's PIT revenue is obtained by multiplying the taxable income in each tax bracket by its corresponding marginal income tax rate. Suppose b_i denotes the lower bound of tax bracket i , m_i is the marginal income tax rate for tax bracket i , Y_i is the average taxable income in tax bracket i , N_i is the number of taxpayers in tax bracket i , T_i is personal income tax paid with taxable income Y_i , and TY_i , which is $Y_i \cdot N_i$, is total taxable income in tax bracket i . Then, the provincial PIT revenue associated with income tax bracket i (R_i) can be calculated as,

$$R_i = T_i N_i = (m_i \cdot (TY_i - b_i N_i) + \sum_{j=1}^{i-1} m_j \cdot (b_{j+1} - b_j) \cdot N_i), i=1, 2, \dots, 5 \quad (1.1)$$

As the economy grows, so will the taxable income associated with each tax bracket. Suppose we assume that the taxable income in each tax bracket grows annually at the rate of γ . In the personal income tax system, the threshold income in each tax bracket is often indexed to the inflation rate. Thus, we also assume that each tax bracket's threshold income grows at the inflation rate (π). In addition, studies such as Diamond and Saez (2011) and Veal (2012) indicate that for high-income earners their taxable income satisfies a Pareto distribution condition that $\frac{Y_5}{b_5} = \frac{a}{a-1}$, where $a > 0$ is the Pareto parameter, Y_5 is the average taxable income of the top income bracket (the fifth bracket), and b_5 is the lower income bound of the top tax bracket. Thus, using eq. (1.1) and the various assumptions discussed above, the mechanical or static revenue effects of Alberta's PIT rate cuts on the provincial government's revenue for each of the five tax brackets in year t can be calculated as follows:

$$\Delta R_{1t} = \Delta m_1 [(TY_1(1 + \gamma)^t) - b_1 \cdot N_1 \cdot (1 + \pi)^t] \quad (1.2a)$$

$$\Delta R_{2t} = \Delta m_2 [(TY_2(1 + \gamma)^t) - b_2 \cdot N_2 \cdot (1 + \pi)^t] + \Delta m_1 \cdot N_2 \cdot [(b_2 - b_1)(1 + \pi)^t] \quad (1.2b)$$

$$\Delta R_{3t} = \Delta m_3[(TY_3(1 + \gamma)^t) - b_3 \cdot N_3 \cdot (1 + \pi)^t] + \{\Delta m_2 \cdot (b_3 - b_2) + \Delta m_1 \cdot (b_2 - b_1)\} \cdot N_3 \cdot (1 + \pi)^t \quad (1.2c)$$

$$\Delta R_{4t} = \Delta m_4[(TY_4(1 + \gamma)^t) - b_4 \cdot N_4 \cdot (1 + \pi)^t] + \{\Delta m_3 \cdot (b_4 - b_3) + \Delta m_2 \cdot (b_3 - b_2) + \Delta m_1 \cdot (b_2 - b_1)\} \cdot N_4 \cdot (1 + \pi)^t \quad (1.2d)$$

$$\Delta R_{5t} = \Delta m_5 \left[\left(N_5 b_5 \left(\frac{a}{a-1} \right) (1 + \gamma)^t - b_5 \cdot N_5 \cdot (1 + \pi)^t \right) \right] + \{\Delta m_4 \cdot (b_5 - b_4) + \Delta m_3 \cdot (b_4 - b_3) + \Delta m_2 \cdot (b_3 - b_2) + \Delta m_1 \cdot (b_2 - b_1)\} \cdot N_5 \cdot (1 + \pi)^t \quad (1.2e)$$

In the above equations, Δ denotes change, t represents time, and all the other symbols are as defined above. We also apply the previous assumption regarding the distribution of taxpayers' taxable income in the top income tax bracket. That is, in equation (1.2e), we use $TY_5 = N_5 Y_5 = N_5 b_5 \left(\frac{a}{a-1} \right)$. Thus, in year t , after the tax rate cuts, the static revenue effect is simply obtained by adding equations (1.2a) through (1.2e).

The static revenue effect discussed above does not provide a complete picture of the revenue effects of tax rate changes, as it ignores the possible behavioural responses of taxpayers associated with the tax rate cuts. Generally, one would expect that tax rate cuts incentivize taxpayers to work, save, and invest more. Moreover, tax rate cuts can discourage tax evasion and avoidance efforts, which in turn raises taxable income and tax revenue. The behavioural response of taxpayers associated with tax rate cuts is captured by the tax base semi-elasticity estimate. Thus, the revenue effects of behavioural responses to tax rate cuts critically depend on the tax base semi-elasticity—which shows the percentage change in taxable income due to a one percentage point cut in the tax rate. Suppose we denote the total taxable income by STY . Further, let ε denote the total taxable income semi-elasticity with respect to the top PIT rate, m_5 , which is defined as $\varepsilon = \frac{\Delta \ln STY}{\Delta m_5}$. Since tax rate cuts provide incentives to save, work, invest and raise economic activities, the taxable income increases when the government cuts tax rates. This implies that the tax base semi-elasticity value, ε , is negative. Ferede (2021) obtained a short-run taxable income elasticity of -0.636 for Alberta. So, we use this parameter estimate in our empirical analysis.¹³

13 While using the short-run elasticity estimate is important to capture the year-to-year fluctuations in revenue associated with tax rate cuts, one can also use the long-run elasticity estimate to project the long-run revenue effects and obtain similar results. For instance, assume that the initial taxable income is \$100,000, short-run elasticity estimate is -0.60, and long-run elasticity estimate is -3.0 (which is about 5 years of adjustment period to reach the long-run equilibrium), and the tax rate is reduced by one percentage point. For the sake of simplicity, assume also the baseline taxable income growth rate is 0%. In the first approach, which is adopted in the study, taxable income would increase by \$600 (i.e., $\$100,000 \times -0.6 \times -0.01$) in each of the five years. Thus, at the end of the 5th year, taxable income would be higher by \$3000 (which is $\$600 \times 5$), as compared with the baseline. Similarly, if one uses the long-run elasticity estimate, due to taxpayers' behavioural responses, after the 5th year,

Ideally, we would have liked to incorporate the behavioural responses of taxpayers in each tax bracket. However, empirical studies that rely on aggregate data often focus on the impact of the top marginal PIT rate on total taxable income, due to a lack of relevant data. As a result, following the approach of studies similar to ours, we use a very simplified approach to incorporate the behavioural revenue effects of the PIT rate cuts. If τ_{ave} denotes the weighted average (weighted by the share of the taxable income in each tax bracket) of the marginal PIT and STY_t represents the total taxable income in year t , then one can obtain the total PIT revenue in year t (R_t) as:

$$R_t = \tau_{ave} STY_t \quad (1.3a),$$

and

$$\text{Behavioural revenue effect} = \Delta R_t = \tau_{ave} \Delta STY_t \quad (1.3b).$$

Since that the semi-elasticity estimate is defined as $\varepsilon = \frac{\Delta \ln STY}{\Delta m_5}$ equation (1.3b) can be rewritten as:

$$\text{Behavioural effect} = \Delta R_t = \tau_{ave} \Delta STY_t = \tau_{ave} \varepsilon \Delta m_5 STY_0 (1+\gamma)^t \quad (1.3c),$$

where STY_0 is the total taxable income before the tax rate change, and the other variables are as defined before.

Our dynamic revenue simulation and projections for Alberta's possible tax rate cuts are obtained by summing equations (1.2a) through (1.2e) and equation (1.3c). The revenue simulation analysis requires us to make additional assumptions about the values of the key parameters, as shown in Table A1 below.

taxable income would increase by \$3,000 using the long-run elasticity (i.e., \$100000X-3.0X-0.01).

Table A1: Summary of Parameters Used in the Revenue Simulation Analysis

Variable	Symbol	Values	Remarks
Tax base semi-elasticity (with respect to the top income tax rate)	ϵ	-0.636	From Ferede (2021)
Pareto parameter	a	1.734	Average for 1989–2021 period.
Growth rate of taxable income	γ	Varies by year. (For years 2025, 2026, and 2027, the growth rates are respectively 6.1%, 5.5%, and 4.9%). For years 2028–30, 4.6% and for years after 2030, 4.4%)	Based on nominal GDP growth forecasts by the Government of Alberta and others (Alberta, 2024a) for years 2025–2027, and Tombe (2018) for years 2028–2040.
Weighted average marginal tax rate	τ_{ave}	0.105	Initial period
Number of taxpayers in all tax brackets ^b	N_i	$N_1=2851686, N_2=217084, N_3=86903, N_4=79477, N_5=43491$	Extrapolated from 2021 tax returns.
Initial total taxable income (in thousands of dollars)	STY_0	228,368,892	Extrapolated from 2021 levels
Initial PIT revenue (in million dollars)		16,552	Government of Alberta forecast for 2024–25 budget year (Alberta, 2025b, 2024c)
Baseline PIT revenue growth rate		0.038	Annual average growth rate for the period 2015–2024.
Lower bounds of all brackets (dollars)	b_i	$b_1=0, b_2=148,269, b_3=177,922, b_4=237,230, b_5=355,845$	Threshold levels in 2024.
Total taxable income of the lower four tax brackets (in thousands of dollars)	TY_i	$TY_1=131,380,853, TY_2=33,320,175, TY_3=16,453,763, TY_4=24,377,212$	Extrapolated from 2021 levels as data for 2024 are not available.
Inflation rate	π	0.02	Bank of Canada's inflation target.
Scenario 1: Immediate tax rate cuts all brackets	Δm_i	$\Delta m_1 = -0.02, \Delta m_2 = -0.04, \Delta m_3 = -0.05, \Delta m_4 = -0.06, \Delta m_5 = -0.07,$	Introducing a single tax rate of 8% (2025)
Scenario 2: Phase I (2025)	Δm_i	$\Delta m_1 = \Delta m_2 = \Delta m_3 = 0, \Delta m_4 = -0.01, \Delta m_5 = -0.02,$	Eliminating the two top brackets in 2025
Scenario 2: Phase II (2026)	Δm_i	$\Delta m_1 = 0, \Delta m_2 = -0.01, \Delta m_3 = -0.03, \Delta m_4 = -0.04, \Delta m_5 = -0.5$	Further reduction of rates to 10% in 2026
Scenario 2: Phase III (2027)	Δm_i	$\Delta m_1 = -0.02, \Delta m_2 = -0.04, \Delta m_3 = -0.05, \Delta m_4 = -0.06, \Delta m_5 = -0.07$	Introducing a single tax rate of 8% (2027)
Scenario 3: 20% tax rate cuts for all brackets	Δm_i	$\Delta m_1 = -0.020, \Delta m_2 = -0.024, \Delta m_3 = -0.026, \Delta m_4 = -0.028, \Delta m_5 = -0.030$	

Notes: See the text for a discussion of the various parameters.

Table A2. Current and Alternative PIT Structure Scenarios

Tax Bracket	Current (2024)	Scenario 1	Scenario 2 (gradual move to a single rate of 8%)			Scenario 3 (20% across-the-board cut)
		2025 and beyond	2025	2026	2027 and beyond	2025 and beyond
1	10.0	8.0	10.0	10.0	8.0	8.0
2	12.0	N/A	12.0	N/A	N/A	9.6
3	13.0	N/A	13.0	N/A	N/A	10.4
4	14.0	N/A	N/A	N/A	N/A	11.2
5	15.0	N/A	N/A	N/A	N/A	12.0

Note: N/A denotes not applicable, as the tax bracket is assumed to be eliminated.

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