

May 2021

FISCAL PLANNING AND SUSTAINABILITY IN ALBERTA

Trevor Tombe

ALBERTA FUTURES PROJECT PRE-PUBLICATION SERIES

Alberta has a long history of facing serious challenges to its economy, including shocks in the form of resource price instability, market access constraints, and federal energy policies. However, the recent and current challenges seem more threatening. It seems that this time is truly different.

The collapse of oil and gas prices in 2014 combined with the rapid growth of U.S. oil production, difficulties in obtaining approval for infrastructure to reach new markets and uncertainty regarding the impacts of climate change policies world-wide have proven to be strong headwinds for the province's key energy sector. Together, the negative effects on employment, incomes and provincial government revenues have been substantial. To make matters worse, in early 2020 the Covid-19 pandemic struck a major blow to the lives and health of segments of the population and to livelihoods in many sectors. The result has been further employment and income losses, more reductions in government revenues and huge increases in government expenditures and debt. These events, combined with lagging productivity, rapid technological shifts, significant climate policy impacts and demographic trends, call for great wisdom, innovation, collective action and leadership to put the province on the path of sustainable prosperity.

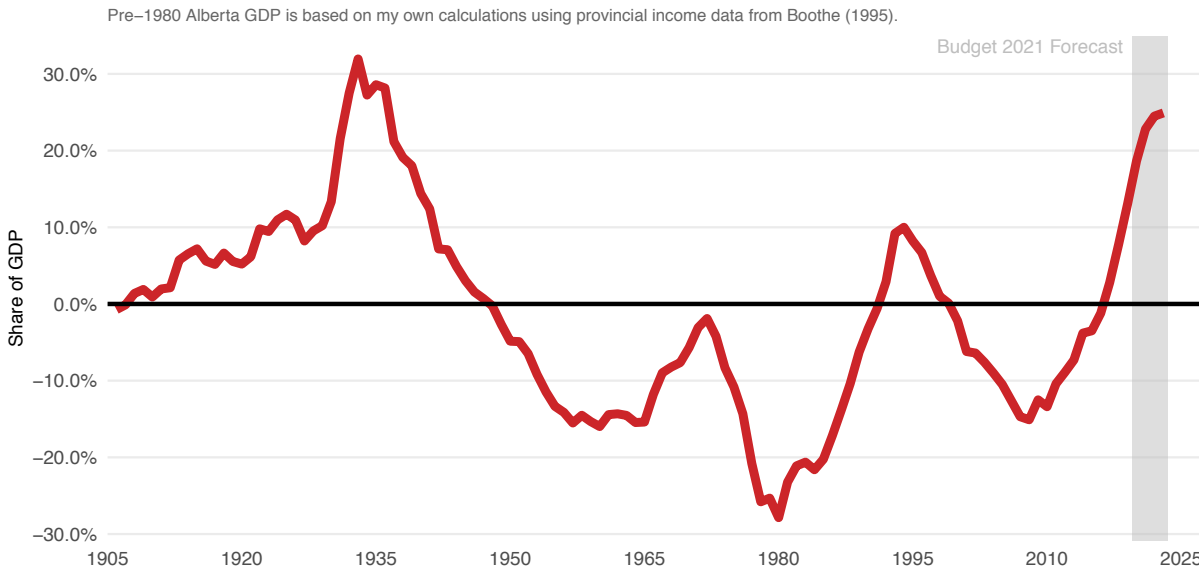
It is in this context that we commissioned a series of papers from a wide range of authors to discuss Alberta's economic future, its fiscal future and the future of health care. The plan is that these papers will ultimately be chapters in three e-books published by the School of Public Policy. However, in the interest of timeliness and encouraging discussion, we are releasing selected chapters as pre-publications.

Managing public finances in Alberta is a challenge. The province confronts significant volatility in its economy and its natural resource revenues. This is especially so in recent years. The dual economic and fiscal challenges from low oil prices and the COVID-19 pandemic highlight the importance of ensuring Alberta's fiscal policies are robust to an uncertain future. Indeed, Alberta has entered new fiscal territory not seen during the lifetimes of most Albertans, and a longer-term perspective is required to recover and to ensure provincial finances remain sustainable into the future. In this chapter, I present new estimates of the long-run fiscal challenges Alberta must address. An aging population and declining resource revenue growth rates mean program expenditures will significantly exceed government revenues over the coming decades. In addition, I illustrate that financial volatility is a substantial and distinct challenge for the province. Even if all program expenditures are funded through revenues rather than borrowing, the fiscal risks facing Alberta vastly exceeds those facing other large provinces. Increasing tax rates, restraining expenditure growth, shifting to more stable sources of revenues, and returning to a low public debt level all need to play a role in ensuring Alberta's finances are sustainable.

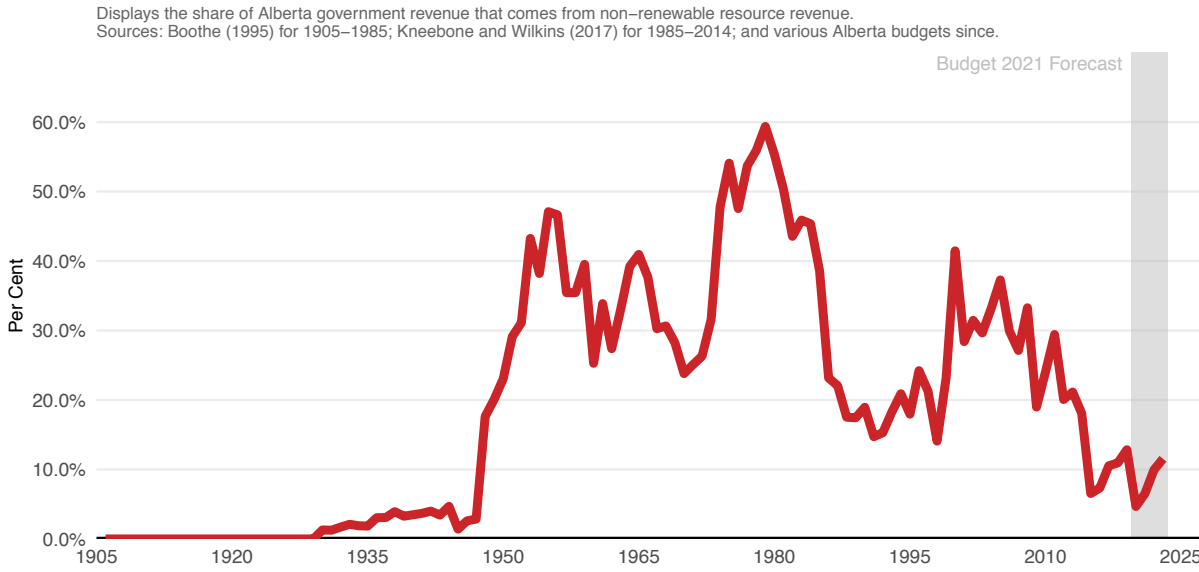
Before proceeding to the main analysis, it is important to appreciate the new fiscal territory Alberta finds itself in. This is revealed by two important metrics: rising debt levels and falling natural resource revenues. Following years of low oil prices, revenues from natural resources have disappointed successive governments. Alberta's Budget 2014 under Premier Redford, for example, projected over \$10 billion in natural resource revenues by 2016/17. Actual resource revenues that year were barely \$3.1 billion and this drop was the principal cause of the \$10 billion deficit that year. Despite this, hopes that revenues would rebound proved optimistic and debt accumulation continued. Figure 1 (a) shows the province's net debt to GDP ratio since its founding. Recent increases, even without the shock from COVID-19, are slated to push the deficit to levels not seen since the Great Depression. Although low relative to many other provinces, and entirely manageable today, most Albertans have not had to consider their fiscal situation in such a context before. In addition to rising debt levels, revenues from natural resources have declined to historic lows. This is illustrated in Figure 1 (b). Since 2014, they account for an average of less than 10 percent of total revenues. Alberta has not experienced such structurally low natural resource revenues since the Leduc Number 1 discovery in the late 1940s. Relative to the roughly one-quarter of its revenues that are required to come from natural resources to balance the budget, the current low shares represent Alberta's core short-term fiscal challenge. Indeed, the gap between what Alberta needs from natural resource revenues and what it receives is higher than at any point since large-scale oil production began.

Figure 1: Alberta’s New Fiscal Reality in Historical Context

(a) Debt to GDP, 1905 - 2023 (F)



(b) Natural Resource Revenues as a Share of Total Revenues, 1905 - 2023 (F)



The influence that natural resource revenues have on Alberta’s budget, and the challenge this creates for planning, is perhaps best seen in how revenues and expenditures rise and fall over time. Figure 2 illustrates the inflation adjusted level of program expenditures and total revenues per person in Alberta compared to an average across all provinces and territories. The dramatically higher degree of fiscal volatility in Alberta relative to elsewhere is clear. When oil prices are high, such as during the 1970s and early 1980s, revenues rise dramatically and so does spending. But when oil prices dropped suddenly in 1986, and did not recover, Alberta returned to

an average level of total revenues. For a while, the province cushioned the fiscal blow with debt but gradually reduced its spending levels over time. From 1987 to 1991, real per capita program spending fell over 23 percent, according to data from Finances of the Nation, and declined another 20 percent by 1997. After 2000, however, oil and gas prices increased, and oil sands production growth began in earnest. Spending started to rise to above average levels once again. More recently, following the 2008 financial crisis, real per capita spending in Alberta and the other provinces has remained roughly stable. But in Alberta's case, revenues per capita continued to fall. These patterns illustrate the consequences of fiscal policy decisions taken in Alberta without a long-term plan. Fiscal policy decisions not anchored in a clear long-term goal expose Alberta to significant risks.

The importance of long-term planning is even more important today as Alberta, like other provinces, is in the process of a significant demographic transition to an older population. Healthcare accounts for over 40 percent of the current provincial budget and is the largest expenditure of the provincial government. And as populations age, healthcare expenditures are set to increase rapidly. Few provinces are fully prepared for this demographic fiscal challenge, but Alberta is even less so.

Given these challenges, it seems clear that Alberta needs a renewed approach to its public finances. Long-term planning that considers both the slow moving (but entirely foreseeable) consequence of population aging and the faster moving changes in resource revenue volatility can improve provincial fiscal policy. To that end, this chapter will present tools to guide fiscal planning with an eye to ensuring the long-run sustainability of Alberta public finances.

PLANNING FOR SUSTAINABLE FISCAL POLICY

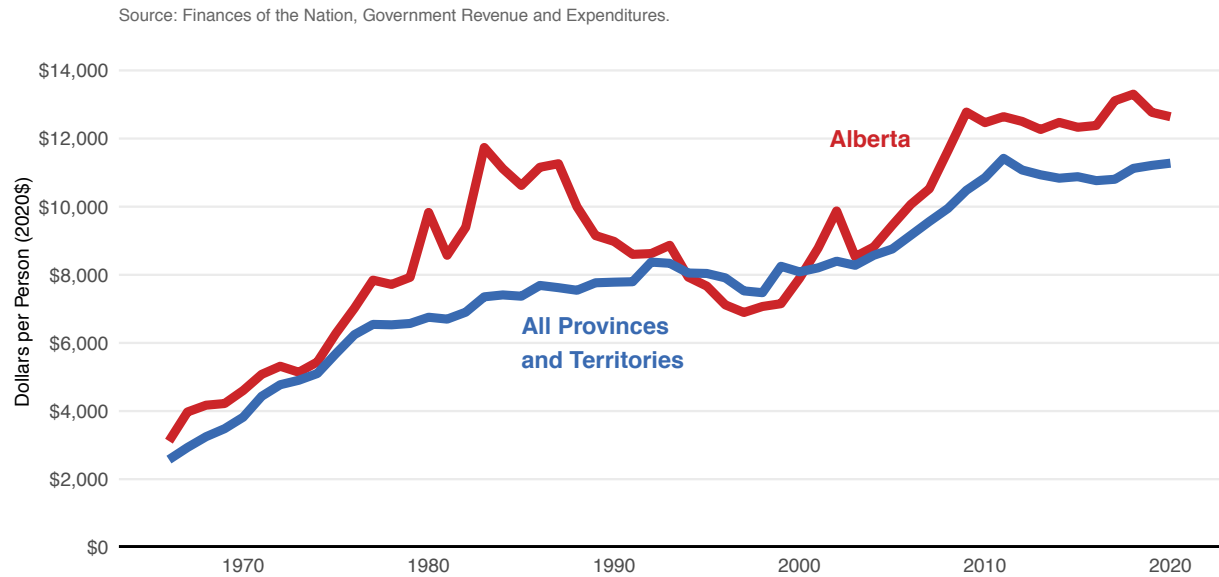
Public debt cannot indefinitely grow faster than the overall economy. This simple statement is the core of analysis investigating whether a government's finances are sustainable. More concretely, fiscal sustainability analysis asks whether a jurisdiction's debt to GDP ratio is bounded – as opposed to increasing or decreasing without a foreseeable end – and if not, how large of an adjustment is required to ensure sustainability. This analysis matters. As debt rises, so too does the cost of servicing it and such interest payments may require higher taxes, or lower levels of program expenditures, than would otherwise be the case.

This chapter will not explore the details of constructing long-run budget projections, but instead summarizes recent estimates from Tombe (2020), updated to incorporate the latest budget projections and the disruptions from COVID-19. A simple expression that captures the central component of long-run fiscal sustainability analysis may be instructive. If interest rates and growth rates are identical, then long-run sustainability merely requires governments balance their primary budgets – that is, revenues must equal program and capital expenditures not including interest payments or, put another way, public services must be paid for at some point with revenues rather than debt. To the extent that they do not, a “fiscal gap” exists. This analysis can be performed over whatever time horizon one finds informative, from 5-10 years, say, to 100-years or

more. Constructing such projections is not trivial in practice but in principle is relatively straightforward. Given some time horizon, one merely needs estimates of the average primary budget balance \bar{p} over that horizon.

Figure 2: Alberta Program Spending and Total Revenues, 1966 - 2020

(a) Program Spending (\$2020 per Person)



(b) Total Revenue (\$2020 per Person)

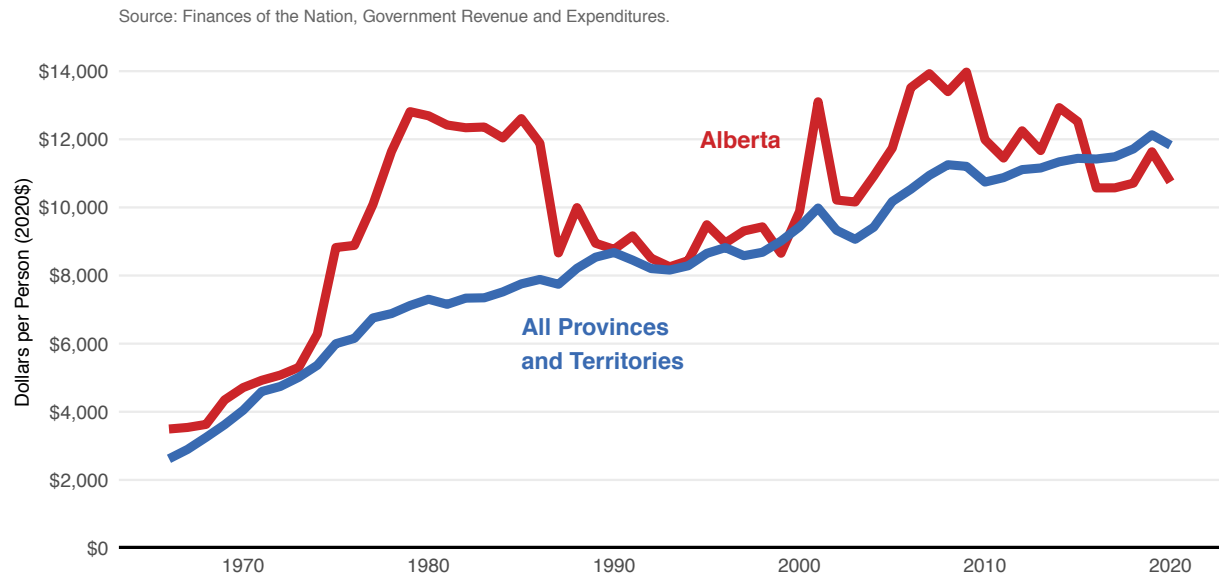


Table 1: Status-Quo Budget Projections for Alberta (Percent of GDP per Year)

	Time Horizon				
	10 Years	25 Years	50 Years	75 Years	100 Years
Tax Revenue	5.6	5.4	5.2	5.1	5.0
Natural Resource Revenue	2.1	2.1	1.8	n/a [*]	n/a [*]
Other Own-Source Revenue	4.0	3.6	3.2	4.6 [*]	4.3 [*]
Federal Transfers	2.4	2.3	2.2	2.1	2.1
Total Revenue	14.1	13.4	12.5	11.8	11.3
Health Spending	5.9	6.1	6.5	6.7	6.7
Education Spending	3.9	3.6	3.3	3.1	2.9
Other Program Spending	7.0	6.3	5.6	5.0	4.4
Capital Spending	1.4	1.4	1.4	1.4	1.4
Total Program Spending	18.2	17.3	16.8	16.1	15.4
Long-Run Primary Balance	-4.2	-4.0	-4.3	-4.3	-4.1

Note: ^{*} Implicitly presumes any resource revenue declines from mid-century onwards are substituted dollar-for-dollar by changes in other taxes. In this table, I shift those values to the “other own-source revenue” row. This analysis presumes a real interest rate of 2 percent over all time horizons and average real GDP growth of between 2.4 and 2.5 percent, depending on the time horizon. See Tombe (2020) for details.

Building on this intuition, one simple way to understand the long-run fiscal situation of a government is to construct something akin to a multi-year budget. We must take care, however, to appropriately compare financial magnitudes across long spans of time to average them together in a simple summary statistic. To that end, I express all units in terms of shares of Alberta’s GDP and discount future values to the present using an effective discount rate $\varphi_T = \prod_{t=1}^T (1 + r_t) / (1 + g_t)$, which is the product from today ($t = 1$) to some future year ($t = T$) of interest rates r_t and economic growth rates g_t .¹ This way of discounting recognizes both the time value of money (through the interest rate) and changes in the economy’s total income (through the economic growth). If interest rates are higher or if economic growth rates are lower, then future values are discounted more heavily. A spending initiative worth 10 percent of GDP ten years from now, for example, is equivalent to $10 \times \varphi_{10}$ today. With this discount rate, it is straightforward to take future projections for revenues and expenditures and construct budget estimates over the next 10 years, 25 years, 50 years, or more. I report the results of this exercise in Table 1, with all values expressed as average shares of GDP per year.

Regardless of the time-horizon, Alberta’s future budget challenges are significant — the gap between provincial government revenues and projected expenditures are roughly 4 percent of GDP. The steadily declining level of other program spending relative to GDP reflects a presumption that the real per capita spending levels in those areas is maintained. As economic growth tends to outstrip population and inflation, spending

¹ It doesn’t matter whether interest rates and growth rates are expressed in nominal or real (inflation-adjusted) terms, so long as they are either both real or both nominal.

in these areas relative to the size of the overall economy will shrink. This is extremely conservative given the high share of labour compensation in program spending, and the fact that wages tend to grow faster than inflation over time. In any case, there is a large gap to fill either through higher revenue or lower program spending. Resource revenues may outperform, of course, which would shrink this gap. But this is risky. Later, I will quantitatively explore the fiscal risks facing Alberta.

Alberta is fortunate to have a variety of potential alternatives to address its fiscal challenges. I will select only a small subset of those options, including measures on both the spending and the revenue sides of the budget. Transparently exploring the fully range of options, and weighing their strengths and weaknesses openly and honestly, will be an important task for the current and for future governments.

HEALTHCARE EXPENDITURE GROWTH

Health expenditures and population aging may represent the largest challenge for program expenditure growth. The reason is simple. The latest data from the Canadian Institute for Health Information's *National Health Expenditure Trends* report finds average annual health costs range between approximately \$3,000 and \$4,000 per person for Albertans in their 20s, 30s, and 40s. But for those over the age of 65, average costs are nearly \$15,000 per person per year (CIHI 2021). And for those over age 80, annual costs are over \$27,000 per person. As populations age, healthcare costs may therefore increase. Combining this data with demographic projections from Statistics Canada reveals that population aging is set to increase spending on healthcare by nearly 25 percent by 2050. And in their "fast aging" scenario, cost increases exceed one-third. Neither scenario includes increases from overall population growth or price increases for health services, drugs, and so on. For perspective, in terms relevant for the province's current Budget 2021, aging is set to add between \$5 billion to \$6 billion per year in health expenditures – equivalent to roughly half of all current revenues from personal income taxes.

Such health cost increases are not inevitable, however, even with an aging population. Various healthcare innovations or reforms to health delivery may help lower costs. Homecare, for example, can be substantially cheaper in certain situations than hospital care. And broadening efforts to improve health outcomes beyond the healthcare system itself may also yield savings. Investments in housing and social services can also improve health outcomes and potentially lower costs in healthcare (Dutton et al. 2018). Recent efforts to constrain health cost growth after 2010 have also yielded results. Historically, the rate at which healthcare prices increase exceed general inflation by over one percentage point per year, although there is material variation across time and provinces. But after 2010, the average health-specific inflation fell to roughly zero. If this zero percent health-specific inflation can be maintained indefinitely, then Alberta's fiscal gap declines by 1.3 percent of GDP – a substantial improvement.

ECONOMIC GROWTH AND REVENUE FROM TAXATION

Demographics also lowers future economic growth. As more individuals retire, the labour participation rate declines. A medium-growth projection from Statistics Canada

suggests the working-age share of Alberta's population will decline by potentially five percentage points by 2050.² This represents an annual drag on economic growth equivalent to roughly 0.3 percent per year. This is significant. Sustained over three decades, it implies overall GDP may be over 7 percent smaller by 2050 than it would be if the labour force participation rate does not decline. For perspective, this is equivalent to roughly \$25 billion per year in foregone economic activity today. And with lower GDP growth comes lower aggregate incomes and consequently lower government revenue. Measures to increase labour force participation among older individuals will help offset this, as will measures to facilitate in-migration of young people. Policy choices that discourage labour mobility, such as a separate provincial pension plan, may run counter to this objective.

While demographics matters, it is not the only factor to consider for Alberta's long-run fiscal future. Unlike many other provinces, where demographics fully account for their projected fiscal gap, Alberta's aging population accounts for less than one-third of its long-run fiscal gap (Tombe 2020). Almost as important is the slow rate of revenue growth. From 2019 to 2050, the baseline projection used as the basis for this chapter suggests annual average total revenue growth of 4 percent. This is less than the projected average (nominal) GDP growth of 4.5 percent per year over the same period. If provincial government revenues keep pace with economic growth, using gradual tax increases, base broadening, or new taxes, Alberta's 50-year fiscal gap declines by 1.2 percent of GDP. Over one-quarter of its long-run fiscal challenge is therefore due to slow revenue growth.

Beyond keeping revenue growth in line with the Alberta's broader economy, the government may also consider larger tax increases to address its long-run challenge. After all, Alberta has the lowest current rates of taxation in Canada. If Alberta adopted the same tax rates and structures as Ontario, for example, its revenues would increase by over \$13 billion in 2021/22 (Government of Alberta 2021, 152). This could involve introducing new taxes (such a value-added tax) or increasing current taxes (such as gasoline taxes, which are currently the lowest in Canada). This could also involve bringing carbon tax revenues back under provincial control or changing the provincial large-emitter carbon tax system.

REVENUES FROM NATURAL RESOURCES

As illustrated in Figure 1 (b), Alberta's provincial government historically requires significant portions of its overall revenues to come from natural resources to fund public services. Today, most such revenues come from royalties levied on oil sands production. For the fiscal year 2019/20, for example, bitumen royalty revenues were \$4.09 billion out of the total \$5.94 billion in total non-renewable resource revenues. By 2023/24, the latest Budget 2021 estimates (as of February 2021) project \$3.89 billion from bitumen royalty revenues out of a total projected \$5.87 billion in overall resource revenues that year.

²

This reflects the M1 scenario of Statistics Canada Table 17-10-0057-01, "Projected population, by projection scenario, age and sex, as of July 1 (x 1,000)." See Tombe (2020) for details.

It is a challenge to project future revenues since they depend so heavily on oil prices. Not only will oil prices affect producer revenues, and therefore their royalty payments, but the royalty rate itself rises and falls with oil prices. Before a facility pays off its initial capital investment, royalty rates are 1 percent of gross revenues when oil prices are low (below \$55 per barrel, WTI \$CDN) which rises to 9 percent when oil prices are high (\$120/bbl). And after capital investments are repaid, the royalty rate is 25 percent of “net revenues” (gross revenues minus allowable costs) for low prices and this rises to 40 percent for high prices. This is a deliberate and defensible feature of resource royalty design, but it does add volatility to these revenues that Alberta’s approach to budgeting does not handle well. In the next section, I illustrate how such budget volatility matters for long-run planning for fiscal sustainability in Alberta – even if the long-run structural gap between revenues and expenditures is addressed in full. Efforts to shift resource revenues away from program expenditures and into a savings fund and replacing this foregone revenue with a more stable source of funds, such as a general sales tax, would significantly lessen the volatility inherent in Alberta’s finances.

PLANNING FOR ALBERTA’S FISCAL RISKS

Planning for long-run sustainability means ensuring that program expenditures are funded by revenues rather than ever increasing debt levels. But Alberta faces unique challenges to long-term planning due to the high degree of volatility the province confronts. In this section, I consider two distinct sources of risk that matter for fiscal sustainability in Alberta: volatility in its primary budget balance (i.e., revenue minus program spending) and volatility in economic fundamentals (i.e., interest rates and economic growth rates). Both introduce distinct, and often underappreciated, long-run fiscal challenges.

VOLATILITY IN THE PRIMARY BUDGET BALANCE

As we have seen, any difference between revenues and program expenditures matters for public debt accumulation. The potential for a persistent gap between the two represents a fiscal gap that, at some point, will require filling. But the average differential between revenue and spending reported in Table 1 is only part of the story. The volatility from year-to-year in primary balances matters as well.

Alberta’s revenue volatility – and therefore the volatility in its primary balance – is large. Since the early 1970s, the standard deviation of annual changes in total revenues was nearly 15 percent in Alberta compared to 7 percent in British Columbia, or 5.6 percent in both Ontario and Quebec. Much of this is due to resource revenues, as the difference in volatility of non-resource revenue growth was not nearly as large. Over this same period, it was less than 10 percent. And measured in terms of the standard deviation of revenue shares of GDP, Alberta also has more than double the volatility of British Columbia at 3.1 percent compared to 1.5 percent. Excluding resource revenues (and scaling up other sources proportionally), Alberta’s standard deviation falls to 2.3 percent. So, depending on the measure, between one-half to two-thirds of the excess volatility relative to British Columbia is due to Alberta’s reliance on natural resource revenues. To be sure, some of the excess volatility in Alberta’s budget is very difficult

to avoid given the underlying volatility in large segments of its economy, which causes income taxes (both personal and corporate) to fluctuate more than elsewhere as the underlying tax bases (household income and corporate profits, respectively) are exposed to oil price movements.

What does such volatility mean for Alberta's future debt levels? The standard deviation of Alberta's primary budget balance as a share of GDP since 1966 is 3 percent. This measure of budget volatility is important for many reasons, but potentially the most intuitive is that it affects the range of future debt levels. To illustrate the implications of this volatility clearly, I abstract from economic fundamentals (by presuming that interest rates and economic growth rates are equal) and assume the distribution of primary balances is normal. Under both conditions, the long-run fiscal adjustment over T years is also normally distributed with a standard deviation of $0.03/\sqrt{T}$. That is, if a 4.5 percent increase in revenue or decrease in spending is required to maintain Alberta's current net debt levels over some time horizon T , then the added fiscal risk adds a 95 percent confidence interval of $6/\sqrt{T}$ percent above or below that adjustment. This is significant. Over a 25-year period, for example, the interval for the fiscal adjustment widens to plus or minus 1.2 percent of GDP. One can also quantify potential extreme outcomes. Alberta's debt ratio, for example, has a ten percent chance of rising by nearly twenty percentage points as a share of GDP over 25 years. British Columbia, meanwhile, has only a one-third of one percent chance of this same adverse outcome. Fiscal risks are therefore a significant planning challenge for Alberta and sustainability is more difficult to ensure.

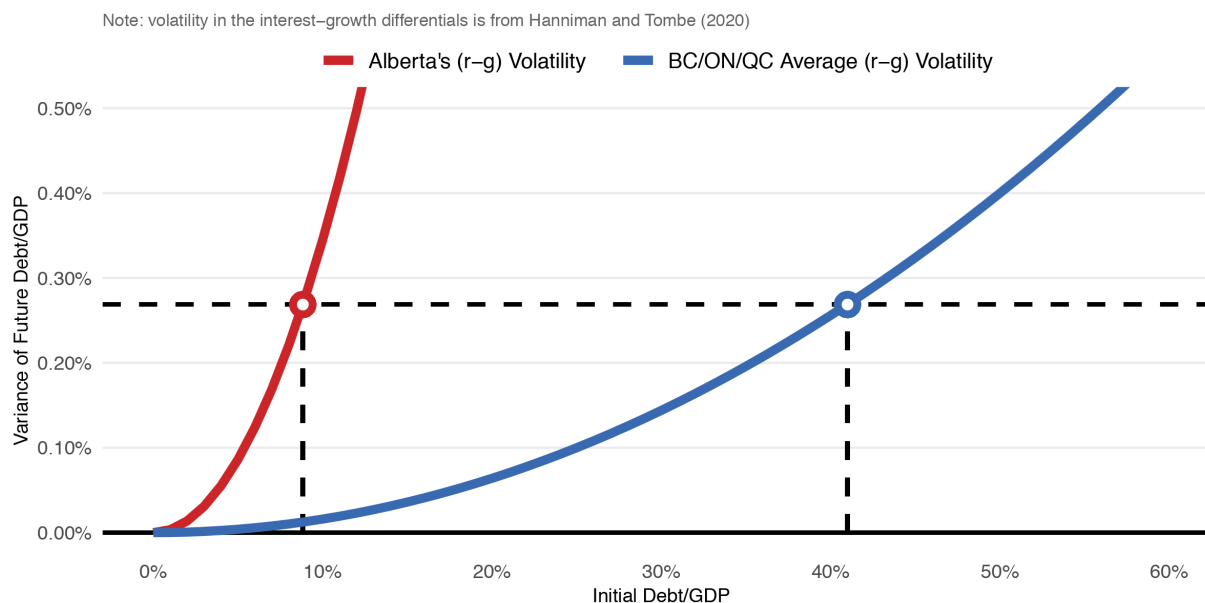
VOLATILITY IN ECONOMIC FUNDAMENTALS

Even if primary budgets balance fully over one's preferred time horizons, and even if budget volatility was mitigated by shifting government revenues towards more stable sources, a subtle fiscal challenge remains in Alberta's future because of current public debt levels. Future debt to GDP ratios, after all, depend not only on borrowing to fund public services, but also on interest rates and economic growth rates. Concretely, debt at some future period T is given by

$$d_T = \varphi_T \times d_0 - \varphi_T \times \bar{p},$$

where $\bar{p} = \sum_{t=1}^T \varphi_t^{-1} p_t$ is the average primary balance over the period. Volatility in interest and growth rates affect future debt levels through φ_T . This fiscal risk is, in part, why many governments adopt so-called "fiscal anchors" to inform policy decisions over what level of debt d_0 is acceptable. As d_0 grows larger, so too does a government's exposure to future adverse movements in either interest rates or economic growth rates.

Figure 3: Variance in Future Debt/GDP Over a 25 Year Horizon, with Balanced Primary Budgets



Whatever fiscal risk one is comfortable with, provinces with more volatile fundamentals require lower levels of debt to GDP to achieve it than less volatile jurisdictions would. Oil producing provinces, for example, have more volatile rates of economic growth and potentially more volatile borrowing rates. They consequently face a wider range of future debt levels than other provinces. To illustrate, if primary budgets balance (on average) over some time horizon T then future debt levels are simply given by $d_T = \varphi_T d_0$. And if $(1 + r_t)/(1 + g_t)$ is log-normally distributed (which is not a bad approximation of the data) then so too is d_T . Conveniently, the standard deviation of d_T is a simple function of the underlying volatility of $r_t - g_t$. If the variance of the interest-growth differential is σ^2 then the variance of future debt d_T is then $d_0(e^{T\sigma^2} - 1)e^{T\sigma^2}$. Over a single year ($T = 1$) this is approximately σ^2 .

To illustrate this more concretely, I use the volatility in interest rates and economic growth rates estimated by Hanniman and Tombe (2020). They find the standard deviation of the interest-growth differential is roughly 9.8 percent for Alberta, compared to between 1.8 and 3.2 percent for Quebec, Ontario, and British Columbia. What does a volatility nearly four times larger than the other large provinces imply for Alberta's fiscal risks? That depends on current debt levels. Over the span of 25 years, starting from an initial debt/GDP ratio of 10 percent, Alberta's potential future debt levels range between 3.8 and 26.1 percent (19 times out of 20) depending on the realizations of interest rates and growth rates. This is a 95 percent confidence interval for future debt levels that spans over 23 percent of GDP. The other large provinces, meanwhile, have substantially lower volatility and their future debt levels span only 5 percent. Based on the actual average debt/GDP for BC, Ontario, and Quebec of 41 percent for 2020/21, their 95 percent confidence interval around debt ratio changes over a 25 year horizon is 10 percent of GDP. For Alberta to face an equivalent degree of fiscal risk over this same 25-year horizon requires an initial debt/GDP ratio of under

9 percent. This is illustrated in Figure 3.³ Importantly, I estimate this volatility of debt increases presuming that the primary budget perfectly balances over the period. That is, this is the range of future debt changes due *only* to the evolution of a province's initial debt level and not future borrowing. It isolates fiscal risks from policy choices. To be clear, nothing here suggests that a 9 percent debt/GDP ratio for Alberta is optimal in any sense. It merely illustrates that for the province to face the same degree of future fiscal risk as the other large provinces, a *substantially* lower debt/GDP is required. What fiscal anchor should be adopted by a province is a key aspect of long-run planning, and this analysis can help inform the appropriate debt to GDP ratio to adopt as a target.

PLANNING FOR A ROBUST FISCAL FUTURE IN ALBERTA

Successive Alberta governments have tended to prioritize short-term objectives at the cost of exposing Albertans to elevated levels of fiscal risk and a budget framework ill-prepared to address long-term challenges. Rising healthcare costs and slowing population growth are twin challenges from demographic change that many provinces face. Ensuring revenues can cover program expenditures is easier when decisions are taken earlier, as the required fiscal adjustment will only grow in time. But unlike other provinces, Alberta faces additional challenges from its reliance on natural resource revenues. This important revenue source – normally relied on to fund a large share of public services – may diminish in importance over the long-term as the global energy transition accelerates. Planning for gradual and sensible reforms in anticipation of this inevitability will ensure the province's finances are sustainable. And perhaps more importantly, the volatility inherent in such revenues represent another challenge by materially expanding the range of future public debt ratios, even if long-term budgets balance. Such risks make planning more difficult and may require a substantially lower debt/GDP ratio in Alberta than other provinces. Despite these challenges, Alberta has a wide range of options. But whatever specific path forward one might prefer, planning is required to achieve it.

³

A variance of 0.25 percent is equivalent to a 95 percent confidence interval for the change in debt/GDP over a 25 year time horizon equivalent to +/-10 percent of GDP.

REFERENCES

- Paul Boothe. 1995. *The Growth of Government Spending in Alberta*. Toronto, ON: Canadian Tax Foundation.
- Canadian Institute for Health Information. 2021. *National Health Expenditure Trends, 2020*. Ottawa, ON: CIHI.
- Daniel Dutton, Pierre-Gerlier Forest, Ronald Kneebone, and Jennifer Zwicker. 2018. "Effect of provincial spending on social services and health care on health outcomes in Canada: an observational longitudinal study." *CMAJ* 190(3): E66-E71.
- Finances of the Nation. 2021. "Government Revenue and Expenditure." Accessed March 8, 2021. <https://financesofthenation.ca/real-data/>
- Government of Alberta. 2021. "Fiscal Plan: Protecting Lives and Livelihoods." *Budget 2021*. Edmonton, AB: Alberta Treasury Board and Finance.
- Ronald Kneebone and Margarita Wilkins. 2016. "Canadian Provincial Government Budget Data, 1980/81 to 2013/14." *Canadian Public Policy* 42(1): 1-19.
- Kyle Hanniman and Trevor Tombe. 2020. "Fiscal Risks and Government Debt in Canada: The Implications of Interest Rate and Growth Rate Volatility." *Finances of the Nation Commentary*. Accessed March 25, 2021. <https://financesofthenation.ca/2020/12/10/fiscal-risks-and-government-debt-in-canada-the-implications-of-interest-rate-and-growth-rate-volatility/>
- Statistics Canada Table 17-10-0057-01, "Projected population, by projection scenario, age and sex, as of July 1 (x 1,000)." Accessed March 31, 2021. <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710005701>
- Trevor Tombe. 2020. "Provincial Debt Sustainability in Canada: Demographics, Federal Transfers, and COVID-19." *Canadian Tax Journal* 68(4): 1083-1122.

About the Author

Trevor Tombe is an Associate Professor of Economics at the University of Calgary and a Research Fellow at The School of Public Policy. Prior to joining the University of Calgary, he was an Assistant Professor of Economics at Wilfrid Laurier University. His research focuses on a broad range of topics from international trade and public finance to energy and environmental policy. His current work focuses on economic integration in Canada, from estimating the size and consequences of interprovincial trade costs to exploring the implications of fiscal transfers between provinces (such as through equalization). In addition to his academic work, he regularly promotes the public understanding of economics and policy issues through numerous public policy papers, active social media presence, and general interest writings in various media outlets.

ABOUT THE SCHOOL OF PUBLIC POLICY

The School of Public Policy has become the flagship school of its kind in Canada by providing a practical, global and focused perspective on public policy analysis and practice in areas of energy and environmental policy, international policy and economic and social policy that is unique in Canada.

The mission of The School of Public Policy is to strengthen Canada's public service, institutions and economic performance for the betterment of our families, communities and country. We do this by:

- *Building capacity in Government* through the formal training of public servants in degree and non-degree programs, giving the people charged with making public policy work for Canada the hands-on expertise to represent our vital interests both here and abroad;
- *Improving Public Policy Discourse outside Government* through executive and strategic assessment programs, building a stronger understanding of what makes public policy work for those outside of the public sector and helps everyday Canadians make informed decisions on the politics that will shape their futures;
- *Providing a Global Perspective on Public Policy Research* through international collaborations, education, and community outreach programs, bringing global best practices to bear on Canadian public policy, resulting in decisions that benefit all people for the long term, not a few people for the short term.

The School of Public Policy relies on industry experts and practitioners, as well as academics, to conduct research in their areas of expertise. Using experts and practitioners is what makes our research especially relevant and applicable. Authors may produce research in an area which they have a personal or professional stake. That is why The School subjects all Research Papers to a double anonymous peer review. Then, once reviewers comments have been reflected, the work is reviewed again by one of our Scientific Directors to ensure the accuracy and validity of analysis and data.

The School of Public Policy

University of Calgary, Downtown Campus
906 8th Avenue S.W., 5th Floor
Calgary, Alberta T2P 1H9
Phone: 403 210 3802

DISTRIBUTION

Our publications are available online at www.policyschool.ca.

DISCLAIMER

The opinions expressed in these publications are the authors' alone and therefore do not necessarily reflect the opinions of the supporters, staff, or boards of The School of Public Policy.

COPYRIGHT

Copyright © Tombe 2021. This is an open-access paper distributed under the terms of the Creative Commons license [CC BY-NC 4.0](https://creativecommons.org/licenses/by-nc/4.0/), which allows non-commercial sharing and redistribution so long as the original author and publisher are credited.

ISSN

ISSN 2560-8312 The School of Public Policy Publications (Print)
ISSN 2560-8320 The School of Public Policy Publications (Online)

DATE OF ISSUE

May 2021

MEDIA INQUIRIES AND INFORMATION

For media inquiries, please contact Morten Paulsen at 403-220-2540. Our web site, www.policyschool.ca, contains more information about The School's events, publications, and staff.

DEVELOPMENT

For information about contributing to The School of Public Policy, please contact Catherine Scheers by telephone at 403-210-6213 or by e-mail at catherine.scheers@ucalgary.ca.

RECENT PUBLICATIONS BY THE SCHOOL OF PUBLIC POLICY

REVERSING THE DECLINE OF CANADIAN PUBLIC MARKETS

https://www.policyschool.ca/wp-content/uploads/2021/04/FMR11_Capital-Markets_Tingle-Pandes.pdf
Bryce C. Tingle and J. Ari Pandes | April 2021

THE U.K. APPLIES TO JOIN CPTPP: WHAT ARE THE IMPLICATIONS FOR CANADA?

https://www.policyschool.ca/wp-content/uploads/2021/04/IE-44_CPTPP-Implications_Stephens.pdf
Hugh Stephens | April 2021

SOCIAL POLICY TRENDS: THE MINIMUM WAGE AND HOUSING AFFORDABILITY

<https://www.policyschool.ca/wp-content/uploads/2021/04/SPT-APRIL-minimum-wage.pdf>
Ron Kneebone and Margarita Wilkins | April 2021

THE OIL PRODUCTION RESPONSE TO ALBERTA'S GOVERNMENT-MANDATED QUOTA

https://www.policyschool.ca/wp-content/uploads/2021/03/EFL46_Oil-Production_Hallak-et-al_final.pdf
Amir Hallak, Adam Jensen, Gilbert Lybbert and Lucija Muehlenbachs | March 2021

ENVIRONMENTAL REGULATION AND THE COVID-19 PANDEMIC: A REVIEW OF REGULATOR RESPONSE IN CANADA

https://www.policyschool.ca/wp-content/uploads/2021/03/EFL48_Environmental-Regulation_Goodday-2.pdf
Victoria Goodday | March 2021

ENERGY AND ENVIRONMENTAL POLICY TRENDS: VALUING ALBERTA'S RENEWABLE ELECTRICITY PROGRAM

<https://www.policyschool.ca/wp-content/uploads/2021/03/EEP-trends-Shaffer.pdf>
Sara Hastings-Simon and Blake Shaffer | March 2021

EVIDENCE-BASED AND COMMUNITY ENGAGED PANDEMIC RESPONSES FOR CALGARY

https://www.policyschool.ca/wp-content/uploads/2021/03/HSP85_Pandemic-Responses_Kohek-et-al.pdf
Jessica Kohek, Meaghan Edwards, Katrina Milaney and Jennifer D. Zwicker | March 2021

THE IMPACT OF PROPERTY TAXATION ON BUSINESS INVESTMENT IN ALBERTA

https://www.policyschool.ca/wp-content/uploads/2021/03/UP30_PropertyTaxation_Dahlby-Ferede-Khanal.pdf
Bev Dahlby, Ergete Ferede and Mukesh Khanal | March 2021

SOCIAL POLICY TRENDS: FIRST ADMISSIONS TO HOMELESS SHELTERS

<https://www.policyschool.ca/wp-content/uploads/2021/03/SPT-March.pdf>
Ali Jadidzadeh and Ron Kneebone | March 2021

AGRICULTURAL POLICY TRENDS: DID COVID SUPPORT FOR BEEF CATTLE PRODUCERS HIT THE MARK?

<https://www.policyschool.ca/wp-content/uploads/2021/03/JSC-6A-Ag-Trends-Beef-Cattle-Spencer.pdf>
Karen Spencer | March 2021

IMPLICATIONS OF AN INFRASTRUCTURE CORRIDOR FOR ALBERTA'S ECONOMY

<https://www.policyschool.ca/wp-content/uploads/2021/02/Infrastructure-Corridor-Tombe-Munzur-Fellows.pdf>
Trevor Tombe, Alaz Munzur and G. Kent Fellows | February 2021

CONSTRAINTS IN THE CANADIAN TRANSPORT INFRASTRUCTURE GRID

<https://www.policyschool.ca/wp-content/uploads/2021/02/Infrastructure-Grid-Rodrigue.pdf>
Jean-Paul Rodrigue | February 2021

SOCIAL POLICY TRENDS: DECLINING INTERNATIONAL STUDENT NUMBERS

<https://www.policyschool.ca/wp-content/uploads/2021/02/SPT-FEB.pdf>
Robert Falconer | February 2021