

# **Financing the Future: Options for Long-Run Debt and Spending Sustainability in British Columbia**

Trevor Tombe  
Department of Economics, University of Calgary

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## **Author Note**

Correspondence concerning this paper should be addressed to Trevor Tombe: Associate Professor, Department of Economics, University of Calgary, 2500 University Drive NW, Calgary, Alberta, T2N 1N4. Email: [ttombe@ucalgary.ca](mailto:ttombe@ucalgary.ca). Phone: 1-403-220-8068.

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## **Abstract**

British Columbia's economy and finances have been strong in recent years. But an aging population and declining real-estate activity may, over the medium and long run, create pressures that current policy is not well equipped to handle. This paper estimates the long-run fiscal situation for the province and finds the status quo unsustainable. Revenue growth lags behind both the overall economy and program spending. The gap between spending and revenue will, over time, lead to unsustainable debt levels. Immediate and permanent increases in revenue or decreases in spending on the order of 3% of GDP are necessary to ensure that B.C.'s debt-to-GDP ratio does not grow without bound. This is equivalent to increasing sales taxes by 8 percentage points or decreasing program spending by nearly 17%. Roughly half the long-run gap between projected revenue and spending is due to slow revenue growth and the other half due to rising health expenditures. Though status quo policy is unsustainable, a wide variety of policy responses are available. This report explores several long-run fiscal scenarios to examine the challenges facing the province, the wide variety of policy responses, and the scope for new large-scale spending initiatives like a basic income program. Gradual changes made today will not only ensure fiscal sustainability but also allow the province to consider expanding social spending programs in a responsible manner.

## Introduction

In recent years, British Columbia's economy has grown at a robust pace, its job growth has led the country, and its near-term fiscal situation has been sound. But challenges await. In addition to the short-term challenge of recovering from the negative economic and fiscal shock related to COVID-19, which is a challenge shared by many jurisdictions, there are important long-run pressures to consider. An aging population will increase health-care costs, and volatile resource revenues and property valuations introduce meaningful uncertainty for revenues. Quantifying the potential magnitude of such pressures, and any long-run gap between spending and revenues, is necessary not only to prepare for those challenges but also to reveal the scope for new large-scale spending initiatives or tax changes. And the long-run sustainability of a basic income program, for example, may require fiscal adjustments today to ensure sufficient fiscal space exists in the future. This paper will compile rich data on the important revenue and spending components of B.C.'s budget and construct a model of the provincial budget over the coming decades. It will examine various options to ensure long-run debt sustainability and explore the scope for new large-scale spending initiatives and options to ensure such spending is sustainable.

What makes a government budget sustainable? The ability to service debt. That is, the government's future stream of primary surpluses (revenue in excess of program spending) must not be less than its stream of debt obligations. If debt grows too large, the required interest payments may exceed the government's primary surplus and it would need to borrow to cover some of those payments. But borrowing to pay interest compounds over time, growing the stock of debt exponentially. This is not sustainable because large and sudden changes in tax or spending policies would eventually be required. A growing economy, which means a growing tax base, eases the burden of debt and therefore may allow for modest and sustainable primary budget deficits—but only to the extent that growth rates exceed interest rates. The precise algebra behind debt sustainability metrics need not concern us here, but it turns out that a debt-to-GDP ratio that is bounded by a ceiling (that is, will not grow beyond some upper limit in the long run) is equivalent to future primary surpluses being sufficient to cover future debt obligations. Alternatively, but equivalently, a government's debt level is sustainable if it is balanced by future primary surpluses. More precisely, sustainability requires the present value of future primary surpluses to be at least as large as government debt. The long-run projection for B.C.'s debt-to-GDP ratio and its future primary balances will therefore be central to the analysis to come. Such a projection will reveal whether current policy may be reasonably expected to yield sufficient future primary surpluses, or if a change in fiscal policy is required.

To that end, this paper develops a rich model of B.C.'s provincial budget. I model 17 individual revenue components, ranging from income taxes to lottery revenue and from investment income to federal transfers. Property transfer taxes are a particularly important component of the budget projection that are also subject to much uncertainty. They receive especially close attention. Each tax is mapped to a projection for its tax base over the coming decades. I find that income and sales taxes grow the fastest, at roughly 4% per year, and property transfer tax revenue will gradually decline over time as housing starts fall. On the spending side, I model five separate categories: health, education, advanced education,

social services, and all other program spending. Health-care expenditures are a particularly important source of future spending growth. Using data from the Canadian Institute for Health Information (CIHI, 2019), I map demographic projections for B.C. onto age and gender-specific health-care spending levels. I find overall health-care costs rise at roughly 5% per year for the next couple of decades. Finally, I model capital infrastructure spending and amortization expenses to perform the analysis on a cash-flow basis. This is in contrast to the accrual basis typically used to report budget figures, but is necessary to model debt dynamics since cash flows determine borrowing requirements.

Putting all revenue and spending components together allows for an annual projection of B.C.'s budget balances and debt levels. There is a persistent gap between future revenue and spending; B.C.'s debt levels are therefore projected to increase over time. Total revenue grows at roughly 3.5% per year and total program spending growth increases from just over 4% in the coming few years to nearly 4.5% by the end of the decade. Many components of government revenue lag behind overall economic growth rates. I project that total revenue will consequently fall from its current 18.6% of GDP to a low of 16.7% by 2040. The resulting primary deficit (including capital spending) rises to 3% of GDP by 2040 and the resulting net debt levels exceed 64%. The resulting debt service costs rise to 3.2% of GDP that year, or one-fifth of provincial government revenue. Without a change in future fiscal policy, this level of debt is not sustainable.

I find a robust gap between spending and revenue that may create challenges for B.C.'s long-run debt sustainability. To ensure sustainable finances, British Columbia could have to increase revenue or decrease spending immediately and permanently by an amount equivalent to roughly 3% of GDP. This is a large adjustment. Adjustment could be immediate or gradual. To maintain the current debt-to-GDP ratio, I estimate fiscal adjustment on the order of 1.5% is necessary in the short term, rising to over 3.5% beyond 2040. For perspective, a fiscal adjustment on the order of 3% of GDP is equivalent to a sales tax (structured as an HST) of roughly 8%. On the spending side, it is equivalent to a \$10 billion reduction in program spending. But if revenue growth is accelerated to maintain its current ratio to GDP, combined with moderated health-care spending growth, I estimate the first gap in the medium term can be eliminated and over the longer term there is a negative fiscal gap. That is, moderated spending growth and faster revenue growth provide space for the B.C. government to expand spending or decrease taxes elsewhere over time.

Projecting long-run finances for British Columbia's government is valuable for examining the sustainability of not only current policy but also potentially new large-scale spending initiatives. I conclude the paper by exploring various scenarios for a basic income program in B.C. Costs vary substantially depending on the program design details. I report 12 scenarios, ranging in costs from under \$2 billion (or 0.5% of GDP) to a high of nearly \$45 billion (or 14% of GDP). The sustainability of such initiatives depends on not only an increase in tax rates to help fund the new spending but also the implications of such programs on spending growth rates elsewhere in the budget. Health care, social assistance, justice, and other spending items may experience slower growth rates in the future in the presence of a basic income program. I examine a number of scenarios and conclude that a basic income program may be sustainable with modest increases in revenue through higher sales tax rates if spending in health, social, and other program areas slows by a few tenths

of a point. Specifically, a 4% HST and 0.3% slower growth in these spending areas yield almost sufficient long-run fiscal space to sustainably deliver a negative income tax of roughly \$8,000 to \$9,000 with a 30% clawback rate.

There are, of course, any number of ways in which a long-run projection such as this will not correspond to actual future developments. These projections are not—in any sense—predictions. Instead, they are careful quantitative estimates of where current policy is pointed. There are a variety of fiscal pressures, on both the revenue and spending sides of British Columbia's budget, that will increase in the future. The existence of unpredictable factors—whether global or local, policy induced or not, fiscal or economic—does not diminish the value of understanding the long-run pressures that we know of today. The main utility of these projections is to guide policy-makers and commentators in their evaluation of current tax and spending policies. To the extent that these policies are unsustainable, based on what we know today, then sensible and gradual changes may be undertaken to prepare. In addition, this exercise reveals the scope for new spending programs—such as a universal basic income—and what fiscal changes might be required to ensure sustainable government finances if such new initiatives are adopted.

There are other long-run projections for British Columbia, such as the annual *Fiscal Sustainability Report* by the Parliamentary Budget Office (Shaw et al., 2018). This analysis differs from the PBO's in a number of ways. First, this paper develops a rich model of individual revenue components of the B.C. budget. The PBO forecast, by contrast, distinguishes only own-source revenues from transfer payments. It also implicitly presumes the ratio of total revenue to nominal GDP in the province is roughly stable over time. As I show below, only half of B.C. revenue sources will grow with the economy. Other revenue components will grow more slowly and some, such as property transfer tax revenue, will decline over the long haul. I also disaggregate B.C.'s spending into more categories and explicitly consider capital infrastructure spending, which is not normally expensed in the year in which the cash flows occur. Finally, the PBO analysis combines municipal and provincial budgets whereas I focus exclusively on the provincial budget and ignore long-run fiscal pressures facing B.C. municipalities.

I begin the analysis with a review of B.C.'s current fiscal situation, both compared to its own recent history and with other jurisdictions in Canada. With that context in hand, I review the longer-run pressures facing each of the province's main revenue and spending components, with a particular emphasis on health-care spending and property-related revenue sources. This detailed model of B.C.'s budget then facilitates long-run analysis to quantify the gap between revenue and spending. I end with a detailed analysis of the policy changes required to ensure sustainable finances, even in the presence of a new and large-scale social program.

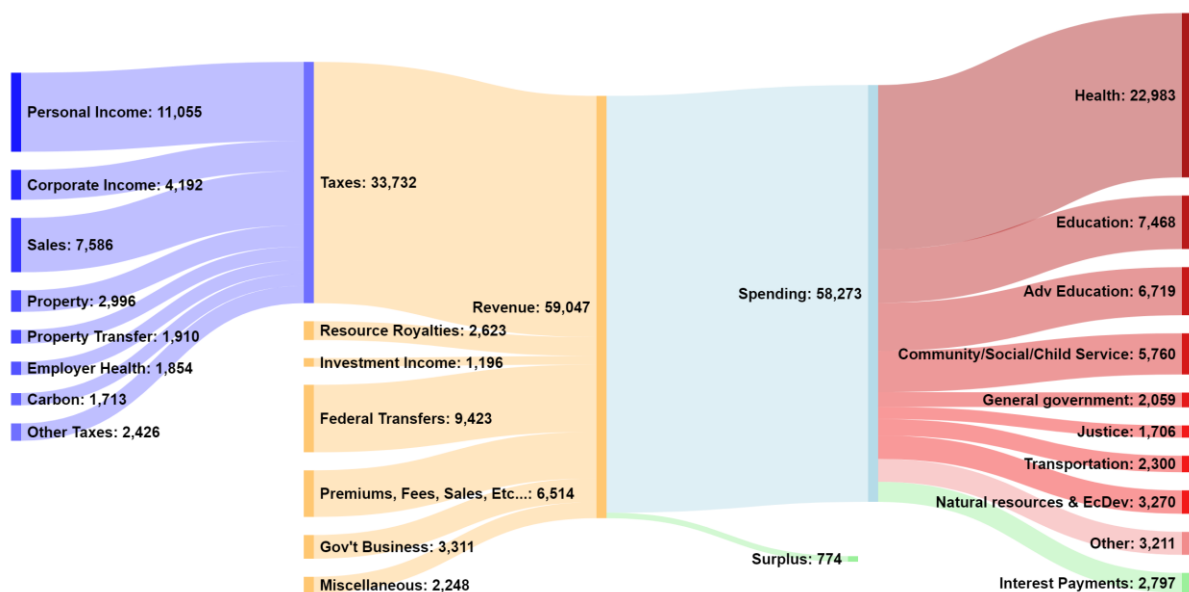
## **Current Fiscal Context**

Projecting a province's financial situation into the future requires that we first appreciate, at a high level, where it is today. In [Figure 1](#), I illustrate the flows in and out of British Columbia's provincial budget for fiscal year 2019/20. This Sankey diagram, as this

type of flow diagram is known, shows the sources of funds on the left and uses of funds on the right.

British Columbia’s provincial revenue sources are varied. Taxes approach \$34 billion and account for over 57% of total provincial revenue. Of this number, taxes on individual incomes generate over \$11 billion in revenue, the provincial sales tax generates nearly \$7.6 billion, and corporate income taxes approach \$4.2 billion. These revenue sources will tend to move with overall economic activity. British Columbia also relies on revenue from property taxes and property transfer taxes, which together generate \$4.9 billion in 2019/20. At over 8% of its total revenue, British Columbia relies on these two taxes more than any other province. Forecasting future property-based revenues will be an important challenge I explore in later sections.

**Figure 1**  
*British Columbia Fiscal Flows for Fiscal Year 2019/20*



Beyond tax revenues, British Columbia receives significant revenues from federal transfers, resource royalties, investment income, profits from its business enterprises, and various premiums, fees, sales, and so on. Federal transfers are overwhelmingly from two sources: the Canada Health Transfer (CHT) and the Canada Social Transfer (CST). The former is nominally meant to offset health-care costs for the province and the latter is to help with social services and related programming. Both are set by a predetermined and explicit formula. Resource royalties are tied to forestry, though oil and gas is also a significant source. Overall, the distribution of British Columbia’s revenue across the 20 most important revenue sources is among the most diversified of all provinces.<sup>1</sup>

<sup>1</sup> Based on the top 20 revenue sources plus an “other” category, the Herfindahl Index for British Columbia’s provincial revenue was 0.109 in 2017, compared to an average of 0.14 across all provinces. Only Saskatchewan had a more diversified distribution of revenue sources.

The expenditure side of the budget is equally varied. But, as with all provincial governments, spending on health care in British Columbia dominates all other areas. For 2019/20, health spending will account for over 41% of total program spending. The importance of this area for the province's future fiscal health goes beyond its current size. In the years to come, as we will see in the next section, an aging population will create significant cost pressures.

Other significant areas of spending include education, both primary and secondary, and advanced education, which captures universities, colleges, and other post-secondary institutions. Combined, total education spending in 2019/20 will approach \$14.2 billion. Social services, which aggregates various functions ranging from social assistance and child welfare to community living and other services, is nearly \$5.8 billion for fiscal year 2019/20. Of this spending, the social assistance budget is \$2.3 billion and the child welfare budget is nearly \$2 billion, making them the two dominant functions within this category. Over time, these budgets grow or shrink with demographic factors (student enrollment and number of children, for example) and poverty rates. All together, these three main functions of government—health, education, and social services—account for nearly 80% of provincial program spending in British Columbia.

Although a snapshot of provincial finances provides important context, the size and distribution of revenue and spending changes from one year to the next. Recessions tend to lower income and sales tax revenue, and increase social assistance spending. In Figure 2, I display the overall budget surplus and deficit for British Columbia since 1981 and forward to 2021 based on the current fiscal projections in Budget 2019. There have historically been large shifts in provincial finances. The early 1980s and 1990s, for example, saw deficits on the order of 2% of GDP. These are large and reflect the large recessions at those times.

Fiscal consolidation after the B.C. Liberal election in 2001 saw a return to surpluses from 2004 until the financial crisis in 2008/09. And though there were deficits in fiscal years 2002/03 and 2003/04, they were smaller than initially projected. Indeed, the years from 2002/03 to 2007/08 saw initially projected budget balances average nearly \$2 billion lower than the final audited numbers. This is equivalent to swings between initial budget balances and final actual balances of 1.1% of GDP over that period. The implications of volatility in provincial budget balances will matter for our debt sustainability analysis to come. In any case, following the modest deficits during the financial crisis, British Columbia has enjoyed relatively stable and modest budget surpluses.

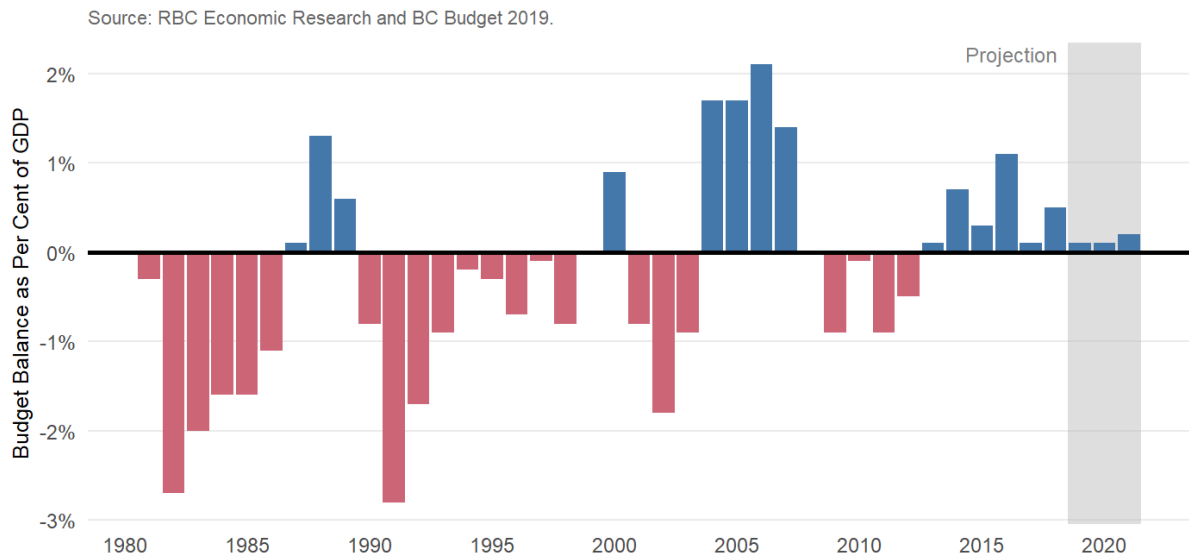
Budget balances matter for provincial debt levels but are not the only factor to consider. In Figure 3, I plot provincial debt levels relative to GDP for British Columbia and for all provinces.<sup>2</sup> The relatively large surpluses in the years prior to the financial crisis resulted in a falling debt-to-GDP ratio in British Columbia. The deficits of the financial crisis saw a modest increase in that ratio, followed by a decrease as surpluses returned. But from 2018 onward, debt to GDP increases despite modest surpluses. Borrowing for capital and infrastructure projects is the reason. Debt levels increase as spending on capital projects exceeds operating surpluses in the province. In the analysis to come, we will explicitly

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<sup>2</sup> Fiscal years prior to 1998 are omitted from the figure, as accounting changes mean those years are not directly comparable to recent years.

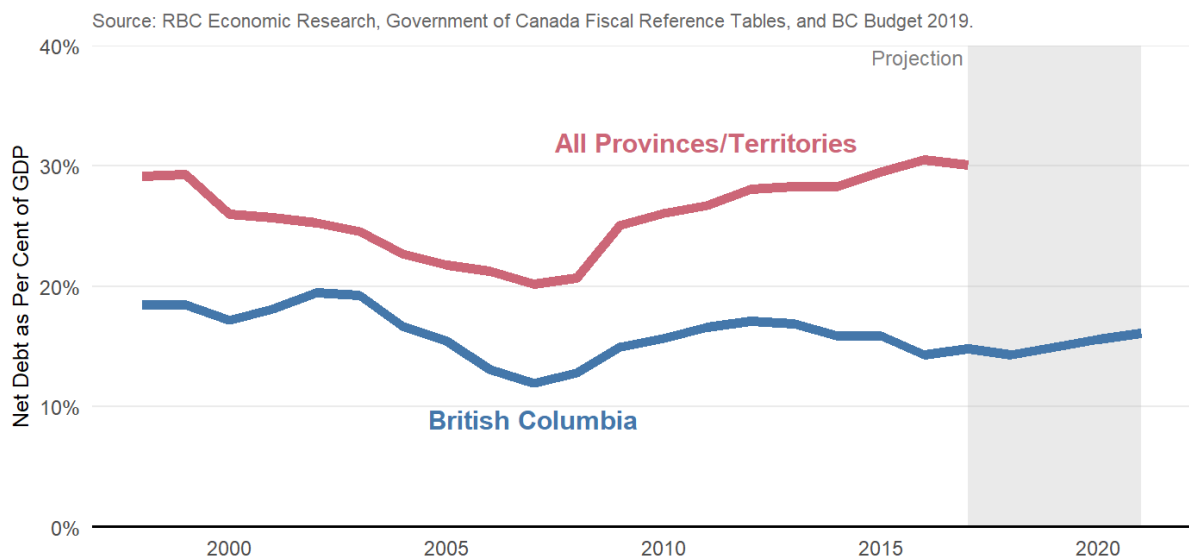
**Figure 2**

*British Columbia Budget Surplus and Deficits from 1981/82 to 2021/22 (Projection)*



**Figure 3**

*British Columbia and All Provincial Net Debt-to-GDP Ratios, 1998/99 to 2021/22 (Projection)*



incorporate borrowing for capital projects, which are only gradually amortized on the operating budget over time. This is important, and distinguishes the analysis to come from what has been done previously, such as by the Parliamentary Budget Office in its debt sustainability reports. In any case, as the graph makes clear, debt levels in British Columbia are low relative to other provinces and will remain so in the near future. Only Alberta and Saskatchewan have stronger provincial balance sheets than British Columbia, and only modestly so.



## A Framework to Quantify British Columbia's Fiscal Gap

Before proceeding to analyze B.C.'s long-run fiscal situation, we must be precise in what "sustainable" finances means.

Sustainable finances for a government are different than for a household or an individual. Governments are infinitely lived, for all practical planning purposes today. And there is no sense in which debt incurred today must be repaid at some fixed future date. When bonds mature, they can—in principle—be rolled over into a new debt instrument. The relevant question for government is therefore whether debt may be serviced today and in the future without necessitating tax or spending policy changes. If current policy is projected to be sufficient to service future debt obligations, then the government's debt position is sustainable. In principle, though perhaps counterintuitively, a growing economy can also mean a growing tax base and therefore perpetual modest deficits can also be sustainable.

A simple model of government finances is informative. Consider a government's primary deficit " $P_t$ " as the difference between revenue and program spending. Interest on previously accumulated debt " $r_t \times D_{t-1}$ " plus the primary deficit represents the change in total debt over the period. That is,

$$D_t = P_t + (1 + r_t) \times D_{t-1},$$

where all values are in nominal terms and therefore not adjusted for inflation. But governments raise revenue largely through taxes on income and consumption. The ultimate tax base for a government to carry and service its debt is therefore the total income in the economy—roughly corresponding to GDP. As debt grows at the rate of interest and the government's carrying capacity grows with GDP, the relevant metric for debt sustainability is the debt-to-GDP ratio. Moreover, a sustainable level of debt is one where the present value of all future debt obligations is no more than the present value of all future primary surpluses available to service that debt. This equivalently requires that the debt-to-GDP ratio is bounded from above or—more simply—that debt to GDP cannot grow without bound.

To aid intuition, it is useful to consider a simple expression that governs how the debt-to-GDP ratio evolves over time. Although I omit the algebraic derivations here, one can show that changes in debt to GDP are governed by

$$\Delta d_t = p_t + \left( \frac{r_t - g_t}{1 + g_t} \right) d_{t-1},$$

where lower-cases denote each variable relative to GDP,  $\Delta d_t$  is the change from  $t - 1$  to  $t$ , and  $g_t$  is the growth rate of nominal GDP from  $t - 1$  to  $t$ . The logic contained in this expression reveals several important results. First, consider a world where revenue always equals program spending—that is, a world with a primary budget deficit that is forever zero. The stock of debt grows at rate  $r$  and the government's ability to pay grows with the economy at rate  $g$ . If  $r > g$ , then at some point the debt grows so large that debt service costs exceed the economy's total income from all activity. This is not feasible, and therefore a zero primary balance in perpetuity would be unsustainable if  $r > g$  and some primary

surpluses are required to bridge the gap. But if interest rates equal the economic growth rate, then sustainable finances allows the primary deficit to be zero. This does not imply the overall budget be balanced, just that the deficit equal total debt-service payments. Finally, to complete the range of scenarios, if economic growth exceeds the rate of interest, then one could run a modest primary deficit sustainably in perpetuity.

The above expression is central for the analysis to come. British Columbia ran an overall surplus of 0.5% of GDP in 2018/19 and a primary surplus of 1.4% of GDP. This current balance is sustainable, but in future years interest rates may rise and economic growth rates fall. In addition, if revenue growth declines below expenditure growth, then the primary surplus will shrink. It is the future values of  $p_t$ ,  $r_t$ , and  $g_t$  that, inserted into the expression above, determine how debt-to-GDP levels evolve.<sup>3</sup> So with this framework in hand, we turn to projecting future revenue, spending, and relevant macroeconomic variables next.

### **Forecasting British Columbia Revenue and Spending**

Government budgets contain many revenue and spending components. Some are more difficult to project into the future than others. Some are also more important than others. Here I pay particular attention to future health-care spending and to property-related revenue components. Following this, I proceed to briefly discuss projection methodologies for all remaining components.

#### **Spending: Health Care**

British Columbia, like many other jurisdictions around the world, has an aging population. The province is already home to a larger fraction of older individuals than Canada as a whole, and the pace of aging is also projected to be slightly faster. Since the early 1970s, the proportion of B.C.'s population over the age of 65 has nearly doubled, rising from under 10% to nearly 20% today. This trend will continue, with current projections suggesting over one in four British Columbians will be over 65 years of age by the early 2030s followed by more modest increases to 2060. I plot a detailed projection in Figure 4 that combines the Government of British Columbia's own projection through to 2041 with a further national projection from Statistics Canada to 2068.

The fiscal implications of an aging population are seen on both the revenue and the spending sides of the provincial budget. First, as individuals retire, income tax revenues will decline. To be sure, pension income and withdrawals from registered accounts are typically taxable sources of income, but some sources of retirement funds (such as tax-free savings accounts or individual non-registered savings) are not. Recent research from Crisan et al. (2015) suggests taxes paid as a share of total income falls by roughly one-third in retirement relative to one's working years. This will put downward pressure on British Columbia's revenue. As illustrated in Figure 5, the number of working-age individuals per person aged 65 years and over will decline from the 3.5 observed today to nearly 2 by the late 2030s.

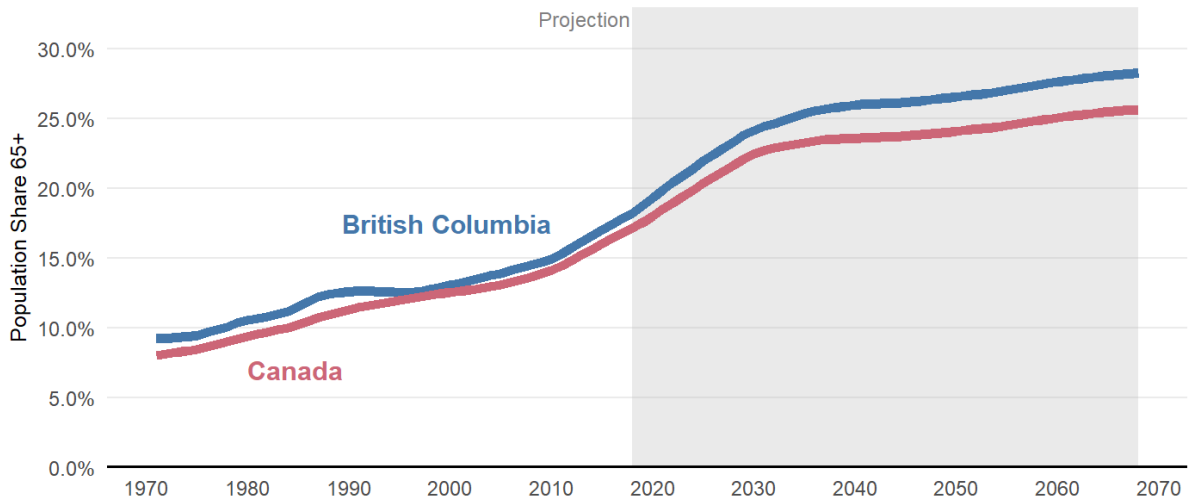
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<sup>3</sup> The expression for the evolution of net debt is somewhat different. Presuming financial assets maintain their real value, net debt to GDP evolves according to  $n_t = p_t + \left(\frac{1+r_t}{1+g_t}\right) \times n_{t-1} + \left(\frac{r_t-\pi}{1+g_t}\right) \times a_{t-1}$ , where  $\pi$  is inflation (presumed constant).

**Figure 4**

*Share of Population Aged 65 and Over, 1971 to 2068 (Projection)*

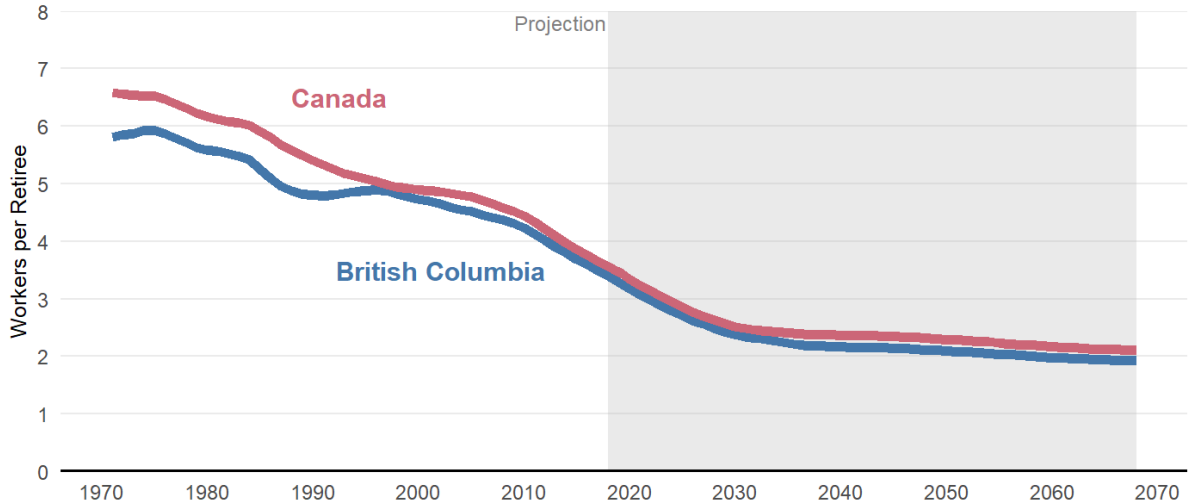
Source: Own calculations from British Columbia-Level Population Projections (Oct 2019) for British Columbia during the period 2019 to 2041 and Statistics Canada M2 scenario (17-10-0057) for Canada and for BC beyond 2041.



**Figure 5**

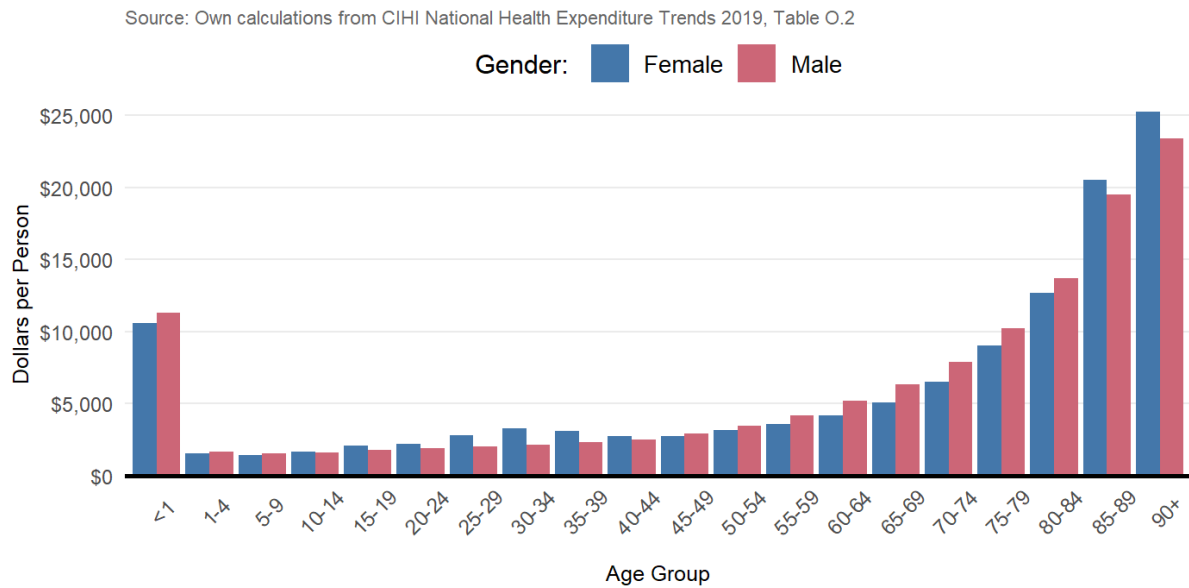
*Workers Per 65+ Population, 1971 to 2068 (Projection)*

Source: Own calculations from British Columbia-Level Population Projections (Oct 2019) for British Columbia during the period 2019 to 2041 and Statistics Canada M2 scenario (17-10-0057) for Canada and for BC beyond 2041.



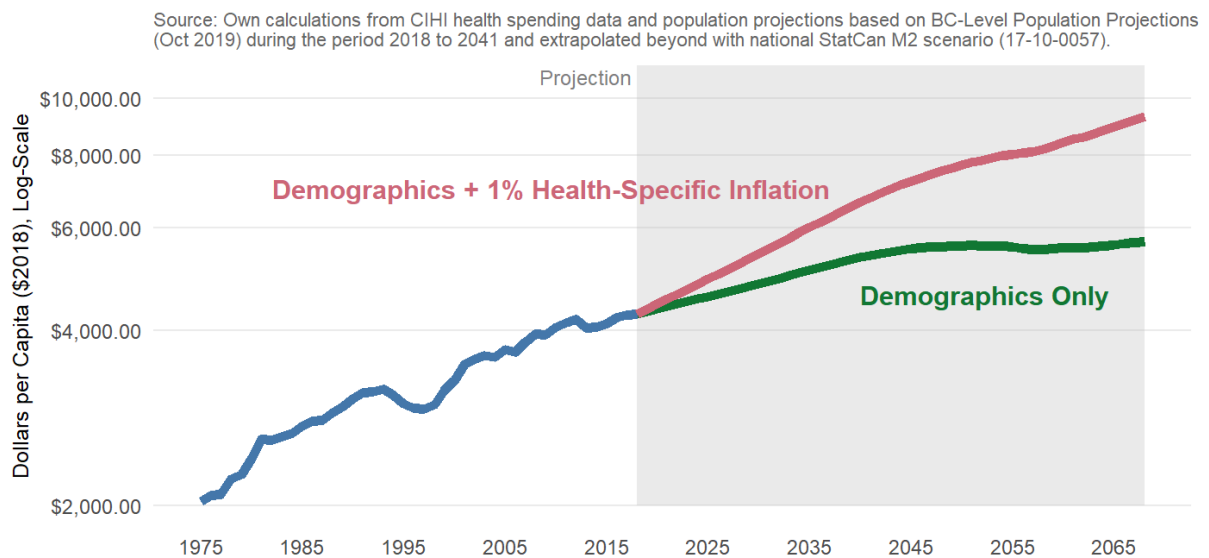
On the spending side of the budget, an aging population will also create pressures. Although provinces are not liable for the rising public pension payments that the federal government is, rising health-care costs will mount significantly over the coming years. In Figure 6, I plot the latest information from the Canadian Institute for Health Information on health-care spending by age and gender groups in British Columbia. It illustrates that the average individual aged 20 to 24 years will incur roughly \$2,000 per year in health-care costs. By the time this individual is over 90 years of age, average health-care costs will be 10 times larger. As British Columbians age, and a larger share of individuals shift toward higher-cost age groups, the overall per capita spending on health care will grow.

**Figure 6**  
*BC Provincial Health Spending Per Capita, by Age Group (2017)*



Demographics will add to health-care cost pressures for the next three decades before those costs plateau at over 30% higher real per capita spending than today. This increase is equivalent to over \$1,150 per capita, or roughly \$5 billion relative to today’s provincial health-care spending in British Columbia. By 2050, the demographic shifts will largely be complete and cost pressures due to an aging population will subside. Indeed, a declining population share among those over 85 and, especially, those over 90, will modestly ease health costs in the 2050s.

**Figure 7**  
*Real Per Capita Health Spending in British Columbia, 1975 to 2068 (Projection)*



In addition to demographic change, health costs will rise because the cost of procedures, drugs, technology, and so on, tends to increase at a faster rate than the

economy-wide rate of inflation. The Canadian Institute for Health Information (CIHI, 2011) estimates that since 2000, the additional health-specific increment over and above general inflation averaged 1.5% per year. In the analysis to come, the baseline assumption is 1% health-specific inflation going forward. As illustrated in Figure 7, this estimate implies that the real per capita level of health spending over the next four decades will double. This real per capita increase is consistent with growth over the prior four decades, suggesting it is a conservative projection. Indeed, as I will report soon, health spending as a share of overall GDP in British Columbia will gradually increase to roughly 9.3% in the long run from its current 7.3%. This rise is only modestly larger than in the PBO fiscal sustainability analysis for B.C., which projects health spending at 9.2% of GDP in the long run despite being based on very different methodologies. I explore a variety of alternative scenarios with lower (and higher) health-specific inflation rates in the analysis to come.

### **Revenue: Property Taxes**

There are two main provincial taxes on property in British Columbia: the property tax and the property transfer tax. The former is largely accounted for by the so-called School Tax and is levied on the assessed value of real property. The specific rate varies across locations, and there is also an additional levy on certain high-valued residential properties. Generally speaking, the rates are adjusted each year such that the average individual homeowner's property tax liability only increases with inflation. The latter tax—the property transfer tax—is levied on real-estate transactions. The current rate is 1% on the first \$200,000 of fair market value of the transferred property, 2% on the incremental value between \$200,000 and \$2 million, and 3% on the incremental value in excess of \$2 million. In addition, effective as of early 2018, transferred residential properties face an additional 2% tax on incremental values in excess of \$3 million.

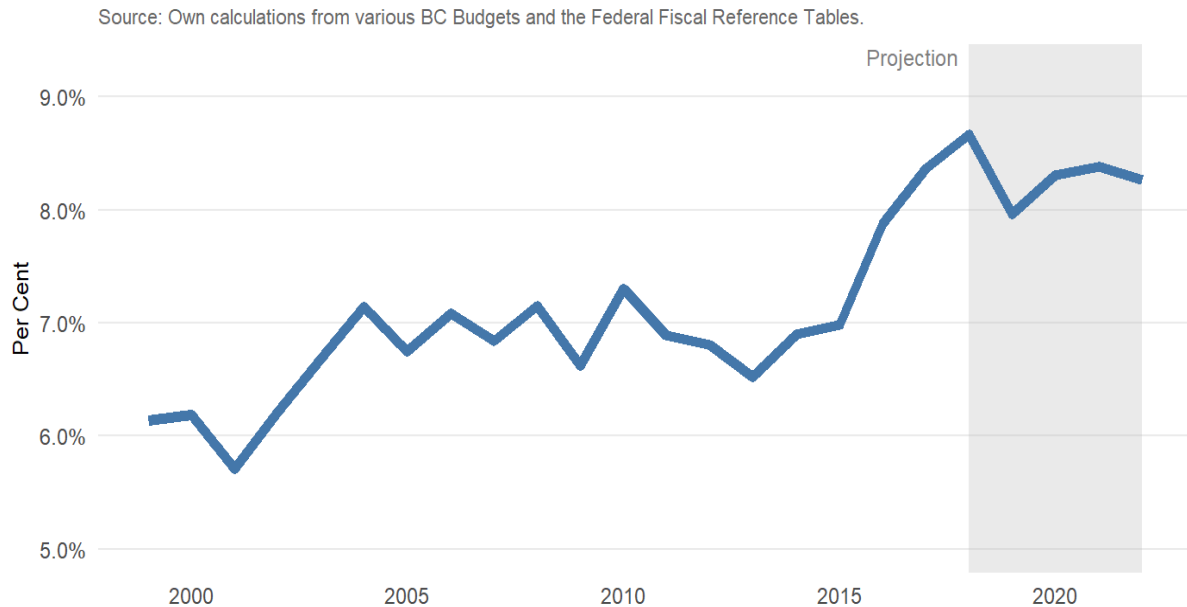
Combined, the two taxes on real property in British Columbia represent a significant source of provincial government revenue. In the decade before the financial crisis, as illustrated in Figure 8, the two taxes accounted for roughly 7% of total revenue. In recent years, given sharp increases in property valuations in the province—especially in the Lower Mainland and Victoria—transfer tax revenue in particular has risen, to a peak of 8.7% in 2017/18. Recent policy changes to ease property values have resulted in modestly lower property transfer tax revenues. In the short term, the province anticipates stable nominal revenues at roughly \$1.9 billion from the transfer tax and over \$3 billion from property taxes.

Property transfer taxes are a relatively volatile source of revenue. Over the past 20 years, the standard deviation of the growth rate of property tax revenues was 2.5%, compared to 4.8% for overall provincial government revenue. The property transfer tax, meanwhile, saw a standard deviation of its annual growth rate of 19.2%. Much of this volatility, however, is accounted for by variation in overall real-estate activity, which is proxied well by housing starts. In Figure 9, I plot the strong positive relationship between real transfer tax revenue and total housing starts in British Columbia over the past two decades. A regression of (log) real transfer revenue on (log) starts suggests a 10% increase in housing starts is associated with a 16% increase in transfer tax revenue, and further suggests over three-quarters of the variation in tax revenue since 1999 is accounted for by housing starts. The strong correlation between transfer taxes and housing starts will prove

useful to project forward future transfer tax revenues, as there exist forecasts for housing starts in the province. Housing starts are also a policy variable that the government can influence through its development and approval processes. In the quantitative analysis to come, I explore the sensitivity of the long-run fiscal balance to changes in housing starts.

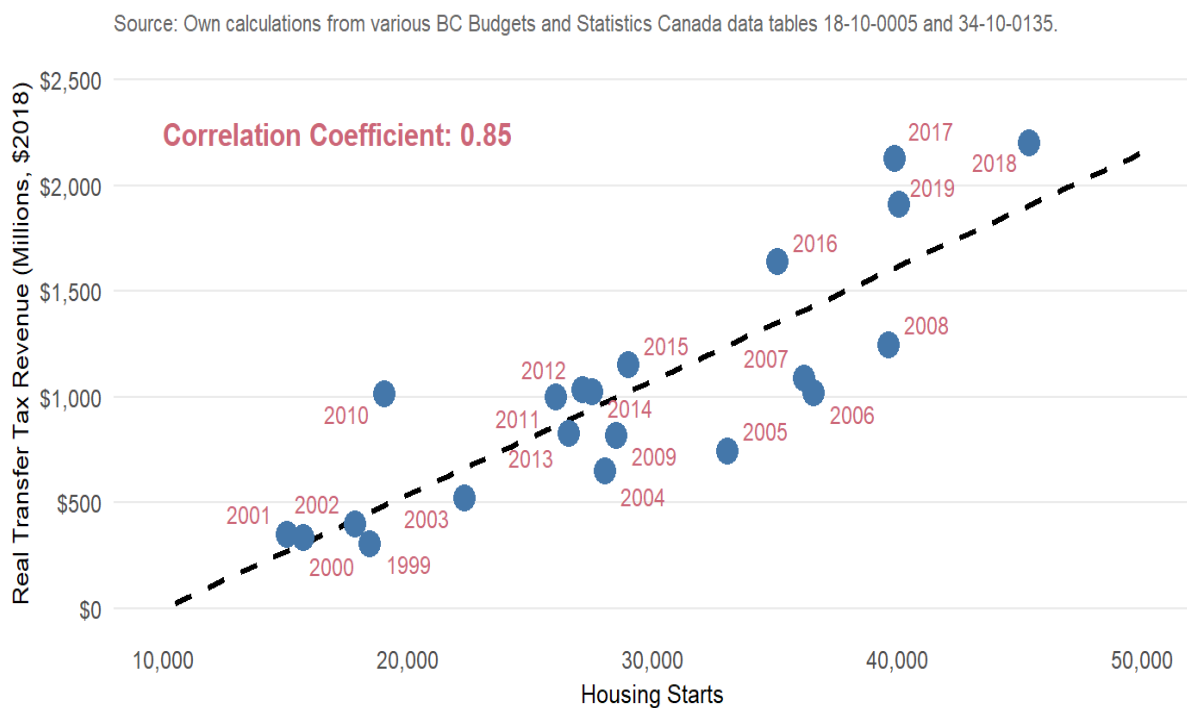
**Figure 8**

*Property-Related Taxes as a Share of Total Revenue in British Columbia, 2000 to 2021*



**Figure 9**

*British Columbia Transfer Tax Revenue vs. Housing Starts, 1999 to 2019*



## Other Revenue, Spending, and Macroeconomic Variables

Projecting a province's fiscal future requires projecting growth rates of various revenue and spending components. It also requires projections for various economic indicators, including population growth, GDP growth, interest rates, and so on. I base most macroeconomic projections on generally accepted sources. I report the implied average annual growth over time in the key macroeconomic variables in Table 1.

**Table 1**

*Macroeconomic Indicators for British Columbia, 2020 to 2040 and Beyond*

	Medium Run				Long Run
	2020–25	2025–30	2030–35	2035–40	2040+
<b>Long-Term Bond Yields</b>	4.5%	4.8%	4.9%	5.0%	5.0%
<b>B.C. Nominal GDP</b>	4.2%	4.2%	4.0%	3.9%	3.8%
<b>Canada Nominal GDP</b>	3.8%	3.7%	3.8%	3.8%	3.8%
<b>B.C. Population</b>	1.2%	1.1%	1.0%	0.9%	0.8%
<b>Canada Population</b>	0.9%	0.8%	0.8%	0.7%	0.6%

For population, both provincial and national, I use the Government of British Columbia population projections. For GDP, I grow real per capita GDP at 1% per year, which implies an aggregate nominal GDP growth of population plus 1% plus 2% inflation. This number is optimistic, as it implicitly assumes improving labour productivity is enough to compensate for an aging population and declining labour force participation rates. This projection, however, is in line with the Conference Board of Canada (CBC) projections for the national Canadian nominal GDP growth between now and 2040, which implicitly presumes real per capita GDP growth of between 0.8% and 1.1%. The sensitivity of the fiscal projections with respect to GDP growth rates will be explored later. Finally, I use the CBC's long-run projection of 4% for the Government of Canada long-term bond yield plus a 1% risk premium for British Columbia bonds to project forward B.C.'s borrowing rate. Between 2020 and the late 2030s, I gradually increase the implied interest rate on B.C. bonds from its current 4.2% to the implied 5% long-run target. Note that though interest rates are relatively low today, this may change in the coming years. And interest rates that exceed the growth of GDP imply that primary surpluses are required to maintain the debt-to-GDP ratio. In the years beyond 2040, for example,  $(r_t - g_t)/(1 + g_t)$  will equal 1.16%. For perspective, maintaining a debt-to-GDP ratio of, say, 15% would therefore require a primary surplus of nearly 0.2% of GDP.

Turning to budget revenue and spending components, I build on the previous discussion that focused on health-care spending and property tax revenues and individually report all 17 revenue components and five spending components. I separately report growth rates for five-year periods between 2020 and 2040 and then the average annual growth rate from 2040 onwards. Growth rates may (and often do) vary by year, but for brevity I report

only the geometric average rate within each period in Table 2. I take British Columbia's Budget 2019 as the starting point, so values reported for fiscal year 2020/21 and 2021/22 are from the budget, and later years evolve according to the assumptions described here.

**Table 2**

*Baseline Growth Assumptions for British Columbia's Budget, 2020 to 2040 and Beyond*

	Medium Run				Long Run
	2020–25	2025–30	2030–5	2035–40	2040+
<b>Personal Income Taxes</b>	4.3%	4.2%	4.0%	3.9%	3.8%
<b>Corporate Income Taxes</b>	6.0%	4.2%	4.0%	3.9%	3.8%
<b>Sales Tax</b>	4.3%	4.2%	4.0%	3.9%	3.8%
<b>Federal Transfers</b>	3.4%	3.7%	3.6%	3.6%	3.7%
<b>Property Transfer Tax</b>	-1.0%	-2.5%	-2.7%	-3.7%	2.8%
<b>Property Tax</b>	3.4%	3.1%	3.0%	2.9%	2.8%
<b>Resource Revenues</b>	4.7%	2.5%	3.3%	3.3%	3.3%
<b>Investment Income</b>	1.5%	2.0%	2.0%	2.0%	2.0%
<b>Tuition Fees</b>	0.2%	3.4%	3.0%	3.4%	3.2%
<b>Tobacco</b>	1.6%	2.0%	2.0%	2.0%	2.0%
<b>Liquor</b>	3.3%	3.1%	3.0%	2.9%	2.8%
<b>Carbon</b>	2.7%	1.0%	2.0%	1.9%	1.8%
<b>Employer Health</b>	4.2%	4.2%	4.0%	3.9%	3.8%
<b>Gasoline Taxes</b>	1.9%	2.1%	2.0%	1.9%	1.8%
<b>Fees, Permits, Etc.</b>	2.6%	3.1%	3.0%	2.9%	2.8%
<b>Lotteries</b>	2.7%	3.1%	3.0%	2.9%	2.8%
<b>Other Revenue</b>	3.8%	4.2%	4.0%	3.9%	3.8%
<b>Total Revenue</b>	3.6%	3.5%	3.5%	3.5%	3.6%
<b>Health Expense</b>	4.9%	5.3%	5.2%	5.0%	4.0%
<b>Education</b>	2.9%	3.5%	3.5%	3.1%	3.3%
<b>Advanced Education</b>	0.0%	3.5%	3.1%	3.4%	3.2%
<b>Social Services</b>	3.3%	3.2%	3.0%	2.9%	2.8%
<b>Other Program Expense</b>	4.9%	4.2%	4.1%	3.9%	3.8%
<b>Total Program Spending</b>	3.9%	4.4%	4.3%	4.2%	3.7%



### ***Education Costs and Tuition Revenue***

Demographics drive spending projections in education as they do in health. I base projected primary and secondary education spending on demographic changes in the 5-to-19-year-old age group. For post-secondary education, I use the 20-to-24-year-old age group.<sup>4</sup> Over the near term, the population of both groups will decline modestly but will soon increase. From 2021 to 2030, for example, the population of 5 to 19 year olds will increase by an average of nearly 0.9% per year. Over the 2030s, this group will continue to increase in number by roughly 0.8% per year. There are more interesting changes among the population of 20 to 24 year olds. From 2019 to 2026, the population will shrink by an average of 2.5% per year. But from 2027 through to 2040, it will begin growing again by 0.8% per year—with a peak annual growth rate of 2.5% near the end of the 2020s. Combined, these demographic shifts ensure only modest spending pressures in education in the near term, though a return to growth later on. In addition to demographics, inflation and real-wage pressures add to costs. I base education cost increases on a conservative estimate of 0.5% real-wage growth for education staff. With these education cost projections in hand, I presume that post-secondary tuition grows in proportion to post-secondary expenditures.

### ***Social Services Spending***

Social service spending comprises the aggregate of social assistance, child welfare, community living, and other social services. Temporary assistance payments depend on caseloads, which reflect the broader economic and employment situation in B.C. Adult community living supports also depend on caseloads but are more sensitive to demographics. Child welfare caseloads are also difficult to project, as the number depends on a variety of other factors and—most importantly—the success of other programs to keep children with their families. In this projection, I presume total social services spending increases with inflation and overall population growth. This conservative projection implies social services are a continuously declining share of the provincial budget from nearly 11% of program spending today to less than 9% within two decades and 7% by 2060.

### ***Carbon Tax Revenues***

The 2018 greenhouse gas (GHG) reference case forms the basis to project carbon tax base forward to 2030. I presume a constant nominal \$50 per tonne tax rate is maintained from 2021 onwards. As there is no projection for B.C. emissions beyond 2030, I adopt a simple assumption that mirrors gasoline tax revenues: revenue grows with real GDP thereafter. To be sure, carbon and gasoline tax revenue will decline as technology and markets evolve and shift consumption away from fossil fuels. This baseline projection implicitly presumes that government endogenously and exactly replaces foregone revenue with another source with similar growth characteristics.

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<sup>4</sup> Results are not materially changed if the 5-to-17-year-old age group is used for primary and secondary education costs and the 18-to-24-year-old age group for advanced education. I opt for 5 to 19 and 20 to 24 to maintain consistency in age groups between both the health and education projections.

### ***GDP-Sensitive Revenues***

Many important revenue sources are directly or indirectly levied on income. Personal and corporate income taxes, for example, are by construction sensitive to changes in aggregate income. These revenues will rise and fall with nominal GDP. Sales taxes and employer health taxes are indirectly exposed to movements in nominal GDP: the former on account of consumer spending growth being a function of household incomes and the latter on account of it being levied directly on corporate payroll. I project revenues from each of these four revenue categories to grow along with nominal GDP. To be sure, income tax progressivity means the distribution of income gains matters. This projection implicitly assumes a common growth in the size of each income tax bracket's base. Finally, gasoline tax revenue also responds to economic activity and income, though I presume it is sensitive to real GDP growth instead of nominal. Average growth of nominal-GDP-sensitive revenue components is 4.1% per year through to 2040 while real-GDP-sensitive components is 2%.

### ***Natural Resource Revenues***

Royalties, land leases, logging stumpage, mining taxes, and so on, generate over \$2.6 billion in revenue to the Government of British Columbia in 2019/20. Forecasting such revenues is made difficult by sometimes volatile moves in commodity prices and in the international trade policy landscape. Softwood lumber disputes with the United States are a particular irritant. I project B.C. resource revenues forward to 2040 based on the CBC's latest projection for real GDP in B.C.'s mining and resource sectors, plus a 2% inflation escalator. For years beyond 2040, I presume the annual real growth matches the average growth forecast for the 2030s. Overall, this projection yields 3.4% annual average growth between 2020 and 2040, and 3.3% per year thereafter.

### ***Federal Transfers***

As in other high-income provinces, British Columbia receives only the Canada Health Transfer and the Canada Social Transfer. These programs evolve according to a simple formula that increases aggregate payments across all provinces according to national population growth, subject to a 3% per year minimum growth in the case of CHT and a fixed 3% per year growth in the case of CST. Based on national population and nominal GDP projections, the implied per capita values are then multiplied by the B.C. population projection to arrive at total CHT and CST revenues received by the Government of British Columbia. In addition to these two major transfer programs, I presume all other federal transfers grow to maintain their real per capita values over time. Overall, I project federal transfers to grow at 3.6% per year on average between 2020 and 2040 and 3.7% thereafter.

### ***Fees, Lotteries, Liquor, and Tobacco Revenues***

Government sales of goods and services, and earnings from lotteries and liquor, are projected to increase along with B.C.'s population and with inflation. This is a slightly smaller growth rate than overall nominal GDP but presumes the real value of consumer spending on these items remains stable. Tobacco growth will be even lower, as I implicitly presume the share of the B.C. population that smokes will decline through time. Specifically, I presume the aggregate revenue from tobacco taxes increases only with inflation. Overall, fees,

licenses, lotteries, and liquor revenues grow at roughly 3% per year while tobacco tax revenue grows at less than 2%.

### ***Investment Income***

Investment income is a highly volatile source of revenue, reflecting the underlying volatility of bond and stock returns. I abstract from this volatility in the baseline projection, but will return to this issue to conclude the analysis. Here, I presume the real aggregate value of the former is stable through time. This implies nominal growth equal to 2% per year in line with the model's underlying inflation projection.

### ***Property Transfer Taxes***

As described earlier, housing starts are strongly correlated to property transfer tax revenues historically. I use a projection for B.C. housing starts to 2040 from the CBC. I project transfer tax revenue to match the growth in housing starts, plus inflation. They anticipate falling starts, which translates into falling transfer tax revenue. Beyond 2040, I presume that housing starts will track changes in B.C.'s overall population.

### ***Other Revenue and Expenditures***

The final two components are "other revenue" and "other program spending." I presume all other revenue sources that are not specifically modelled grow in line with nominal GDP. I presume the same for other program spending not explicitly modelled here.

### ***Capital and Infrastructure Spending***

Capital and infrastructure expenditures are not typically expenses immediately in the year in which the cash spending occurs. This accrual approach to budgeting is common across governments in Canada as well as across businesses. Cash used to finance capital projects, however, can affect the path of future debt in the province. In recent years, the B.C. government has spent roughly 3% of GDP on infrastructure. This has ranged from a low of 2.3% in 2017/18 to a projected high of 3.4% in 2019/20. The timing of projects can affect this annual value. Based on the total size of the capital plan, the stock of capital evolves through time based on a presumed amortization rate of 4.9%—consistent with recent years' budget data. Finally, a non-trivial share of the capital plan budget is self-supported through arm's-length entities or Crown corporations. Consistent with recent years, I presume one-third of capital plan expenditures are self-supported. Net capital borrowing from the perspective of the overall consolidated B.C. budget, however, is then the total capital plan less amortization expenses. This averages roughly 2% of GDP each year. I add this capital borrowing to the primary budget balance of revenue less program spending.

## Projecting British Columbia Finances to 2060

The preceding paragraphs describe a rich model of British Columbia's consolidated provincial budget. With this model in hand, a variety of relevant future metrics may be projected. The ultimate goal of the forthcoming analysis is to quantify and summarize the gap between revenue and expenditures, and explore various options to close the gap (if any) that the analysis uncovers.

### Long-Run Revenue, Spending, and Debt

Over time, both revenue and program spending will grow more slowly than British Columbia's overall economy. This is especially true, however, for revenues. The previous section detailed growth rates by individual components. Relevant for fiscal sustainability analysis, however, is the ratio of revenue, spending, primary balances, and net debt to GDP. In Table 3, I report the ratio of various budget components to GDP for the next 20 years and for the projected end-of-century value. Revenue will decline by nearly 2 percentage points of GDP by 2040 while program spending will decline only modestly relative to GDP. Debt service costs, however, will triple—accounting for 3 cents of each dollar in final economic activity in the province by 2040.

There is a simple cause of the relatively slow revenue growth. Currently, roughly half of B.C. government revenue is projected to grow with provincial nominal GDP. Other revenue components will grow at slower rates. Thus, overall total revenue will grow on average around 3.5% per year while GDP growth is projected to be around 4%. This leads to a declining share of GDP going to total provincial government revenue. As we will see, this is one of the primary drivers of British Columbia's long-run fiscal gap.

The two key driving forces behind this deteriorating fiscal situation have been alluded to in previous sections: slow property-related and carbon revenue growth and increased health-care spending. The Conference Board of Canada forecasts declining housing starts in British Columbia, which will imply declining revenues from property transfers. In the baseline projection, I estimate 1% average rates of decline in property transfer taxes between 2020 and 2025, rising to 2.5% average annual reductions from 2025 to 2030, and by the period between 2035 and 2040 the rate of decline will approach 4% per year. In the medium and long run, carbon tax revenues are also projected to grow more slowly than aggregate GDP or spending. Falling emissions erode the carbon tax base (which, of course, is the ultimate goal) but rising carbon tax rates will (at least in the short run) offset this decline to some extent. On the spending side of the ledger, rising health-care costs account for roughly 55% of total program spending growth from now to 2060.

**Table 3***Long-Run British Columbia Budget Projection (% of GDP), 2020 to 2100*

	Medium Run					Long Run
	2020	2025	2030	2035	2040	2100
<b>Total Revenue</b>	18.5	18.0	17.4	17.0	16.7	14.5
<b>Program Spending*</b>	19.8	19.1	19.3	19.4	19.6	18.5
<b>Debt Service</b>	0.9	1.3	1.8	2.4	3.2	21.1
<b>Primary Deficit*</b>	1.3	1.1	1.8	2.4	3.0	4.0
<b>Health Spending</b>	7.3	7.5	7.9	8.3	8.7	9.3
<b>Net Debt</b>	15.5	21.9	32.0	46.0	64.0	444.2

Note: \* Includes spending on capital infrastructure.

The gap between revenue and spending leads to larger primary deficits. Currently, the primary deficit (including spending on capital infrastructure) is approximately 1.3% of GDP. This number will remain stable over the short term, though rise to over 2% early in the next decade. By 2040, this key measure of the government's budget balance will increase to 3% and continue growing thereafter. In nominal terms, that implies a primary deficit of nearly \$22 billion that year. Such a fiscal imbalance leads to accumulating net debt levels. Currently at 15% of GDP, net debt will rise to roughly one-third by 2030 and to nearly two-thirds of GDP by 2040. This rising net debt to GDP—illustrated in Figure 10—is not sustainable, as it is increasing without bound. Equivalently, the present value of projected primary deficits from 2020 to 2040 is 40% of GDP. This is in addition to the B.C. government's current stock of net debt. By the end of the century, the present value of primary deficits will exceed 180% of GDP. This is not sustainable, since one requires future primary balances to offset current debt rather than add to it. Concretely, using the algebraic expression for debt dynamics and values for interest rates and growth rates in Table 1, debt levels equivalent to two-thirds of GDP by 2040 would require a primary surplus of 0.8% of GDP to maintain the debt-to-GDP ratio. The baseline projection in Table 3 is instead for a primary deficit of 3%.

Exploring measures to improve British Columbia's fiscal situation and ensuring that new spending programs are sustainable in the long run will occupy the remainder of the paper.

### **Maintaining the Current Debt-to-GDP Ratio**

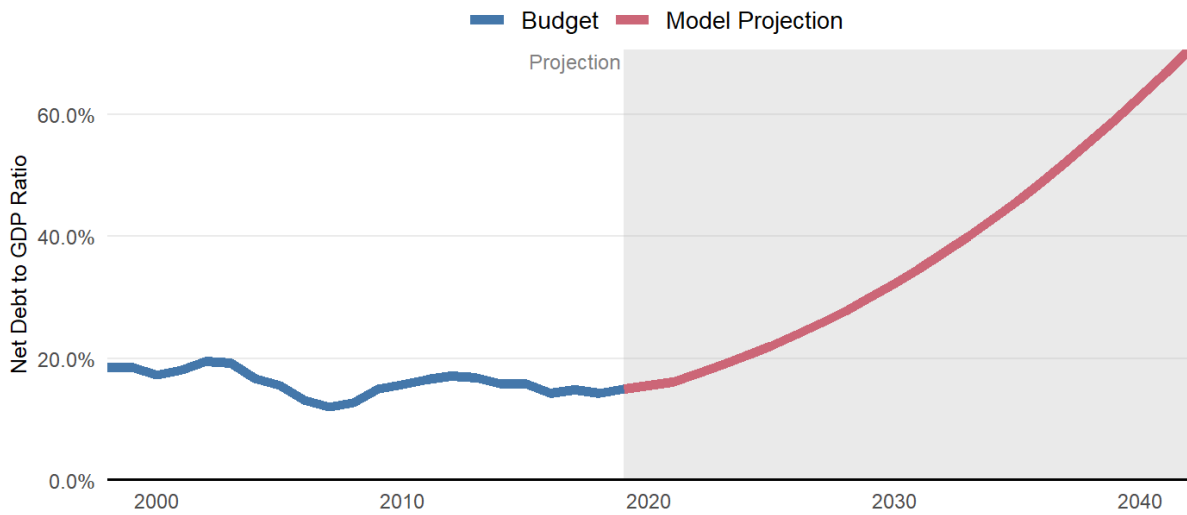
Demographic pressures manifest themselves gradually over time. An increasing degree of fiscal adjustment would therefore be required to maintain British Columbia's current debt levels. This scenario does not imply that increasing fiscal effort over time is optimal, but precisely quantifies the revenue and spending pressures future government will face.

Maintaining British Columbia's net debt to GDP at its current level of 15% requires less fiscal adjustment at first and larger adjustments later. In Figure 11, I report the increase in each year's revenue or decrease in each year's spending relative to the baseline

**Figure 10**

*Baseline Projection for British Columbia's Net Debt-to-GDP Ratio*

Source: Government of Canada Fiscal Reference Tables, BC Budget 2019, and own calculations for 2019 onwards.

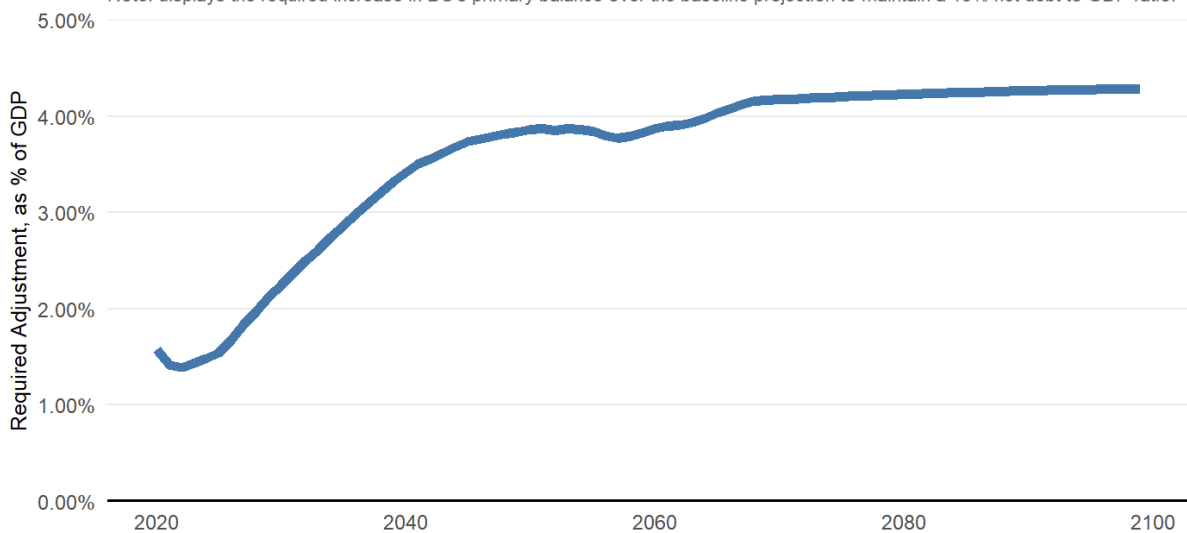


projection required to maintain a constant 15% net debt-to-GDP ratio. Initially, the fiscal adjustment is roughly 1.5% of GDP—equivalent to just over \$4.5 billion, or 4 HST points—but this number gradually increases as health cost pressures mount. By 2050, the required adjustment to ensure a stable net debt position is nearly 4% of GDP. In today's terms, that is equivalent to nearly \$13 billion or over 10 HST points. Beyond 2050, fiscal pressures will ease and the required adjustment stabilizes at just above 4.2% of GDP through to the end of the century.

**Figure 11**

*Required Fiscal Adjustments to Maintain a 15% Net Debt-to-GDP Ratio*

Note: displays the required increase in BC's primary balance over the baseline projection to maintain a 15% net debt to GDP ratio.



## The Long-Run Fiscal Gap

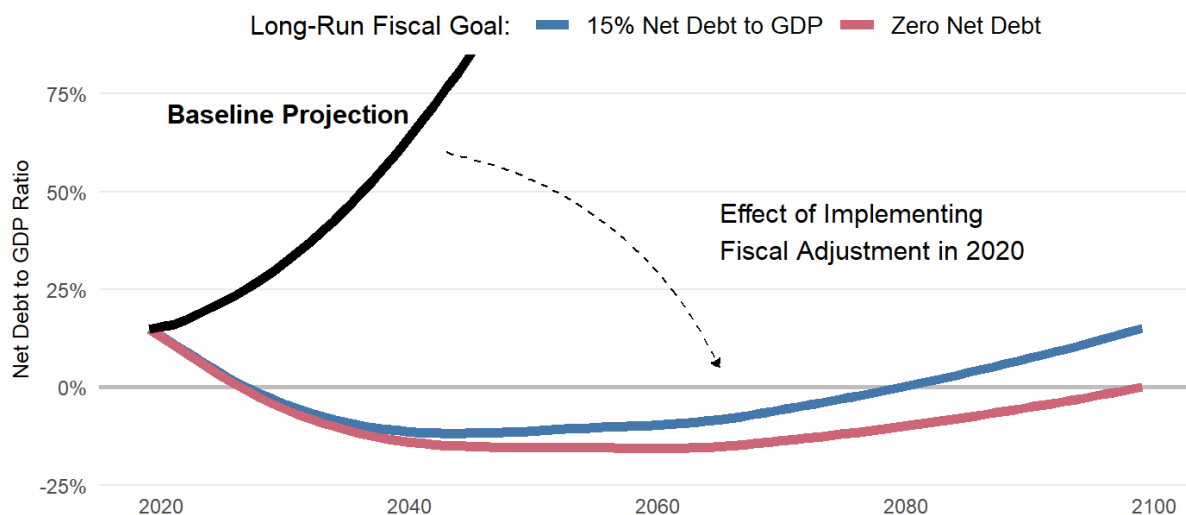
Instead of gradually increasing adjustment through time, government could enact a larger fiscal adjustment in early years in exchange for less adjustment later. One possibility is to enact an immediate and permanent fiscal adjustment, sustained at a constant share of GDP over time. More than a potential policy option, this exercise is particularly powerful to simply and transparently highlight the magnitude of what’s called the “fiscal gap”.<sup>5</sup> Specifically, the fiscal gap is the amount of adjustment required to achieve a particular debt target in the future, typically retiring outstanding debt over the very long run. Depending on the time horizon, and the debt target, the magnitude of action required and the implied time-path of the debt will vary.

In Figure 12, I illustrate the effect of an immediate and permanent fiscal adjustment—either an increase in revenue or a decrease in spending—to achieve a 15% net debt-to-GDP ratio by 2100 or zero net debt. In both cases, British Columbia debt levels decline until the early 2040s before rising once again. The rapid decline at first reflects the consequence of larger adjustments in the near term than would be required to maintain debt levels.

**Figure 12**

*The Effect of Fiscal Adjustment in 2020 on British Columbia’s Net Debt-to-GDP Ratio*

Note: Displays the projected net debt to GDP if fiscal adjustment is implemented in 2020 to eliminate the 80-year fiscal gap.



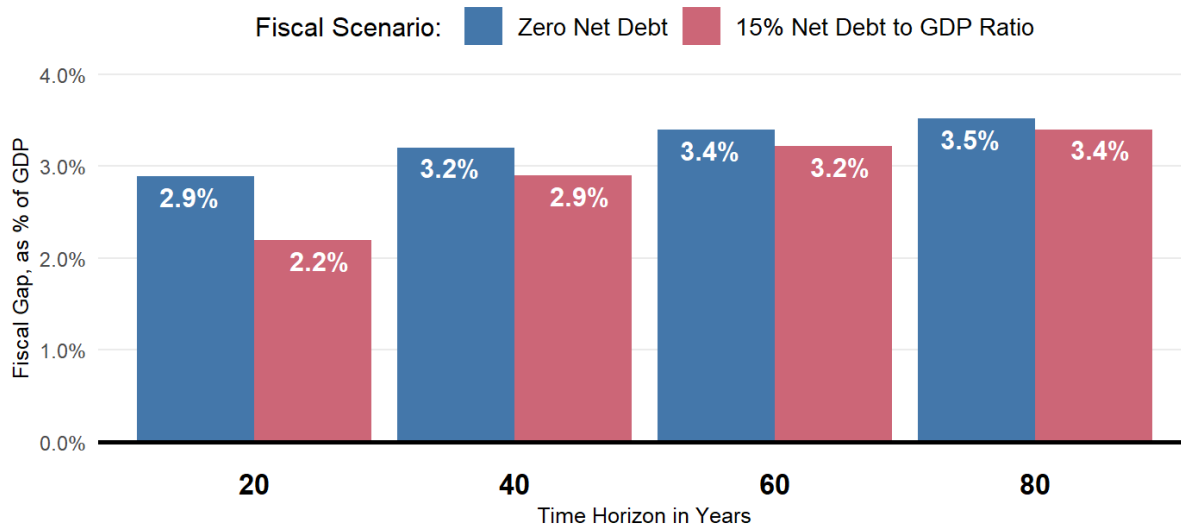
Depending on the time horizon and the debt target, the magnitude of the adjustment would be larger or smaller. In Figure 13, I illustrate the size of the fiscal adjustment to target zero net debt or 15% net debt to GDP within 20, 40, 60, or 80 years (all starting in 2020). The fiscal gap for British Columbia is therefore equivalent to roughly 3% of GDP—equivalent to 8 HST points.

<sup>5</sup> This mirrors the analysis put forward in Auerbach (1994), and many subsequent papers.

**Figure 13**

*Long-Run Fiscal Gap Estimates for British Columbia*

Note: Displays the size of the permanent fiscal adjustment starting in 2020 to either eliminate net debt or achieve historical net debt to GDP over various time horizons.



These point estimates of British Columbia’s long-run fiscal gap depend crucially on underlying model assumptions. But across a wide variety of simulations and assumptions, a meaningful and persistent gap between program spending and revenue remains. For example, if long-run nominal interest rates are 3% instead of 5%, the overall cost of B.C. government borrowing would be lower but the fiscal gap would decline by less than 0.1. Although the specific value may be uncertain, the existence of a large fiscal gap is not. To illustrate, if GDP growth were stronger, the fiscal gap would be smaller. Increasing labour productivity growth by 0.5% per year lowers the 2040 gap from 2.9 to 2.6 and the 2060 gap from 3.2 to 2.6 and the 80-year gap from 3.5 to 2.4. Decreasing health-care-specific cost inflation to 0.5% from the baseline 1% lowers the 20-year fiscal gap by 0.3 and the 60-year gap by 1.1. Faster population growth also shrinks the fiscal gap, but only by 0.1 for the 20-year gap and a similar amount for the 60-year gap for a 0.5% faster annual population growth rate.

**Backloading Fiscal Adjustments**

An immediate and permanent increase in revenue or a decrease in spending can ensure long-run debt sustainability but represents larger upfront fiscal adjustment than is necessary. As illustrated in Figure 12, the debt-to-GDP ratio declines at first and gradually rises later. Alternatively, consider less fiscal adjustment at first and more after demographic pressures subside. In effect, the government can accommodate the medium-term fiscal pressures by allowing modest increases in debt to GDP and, later, bringing that ratio back down over time. I illustrate such a scenario in Figure 14, which allows for debt to GDP to rise to 40% over 50 years before gradually declining thereafter.

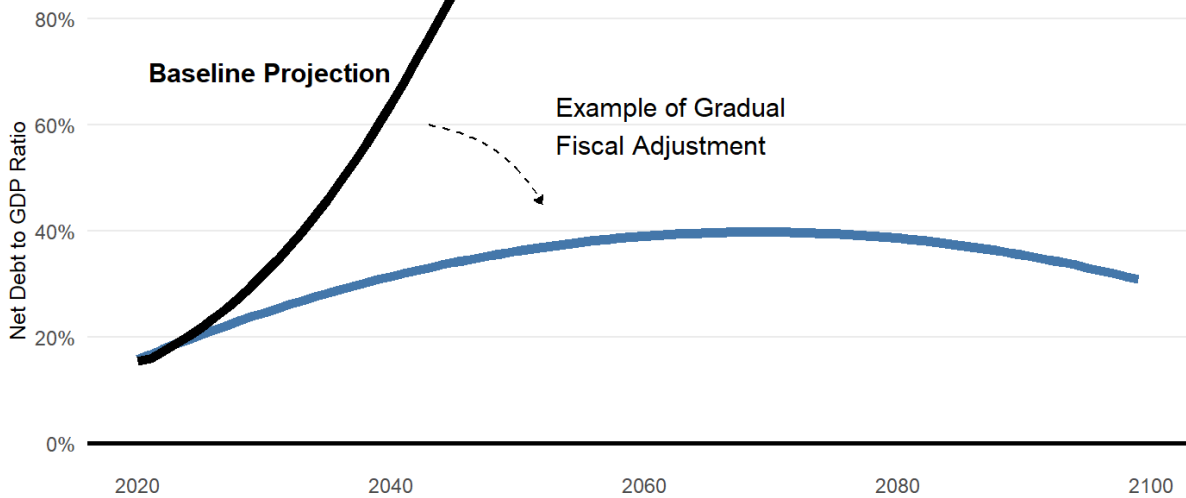


**Figure 14**

*Illustrating Gradual and Accommodative Fiscal Adjustment*

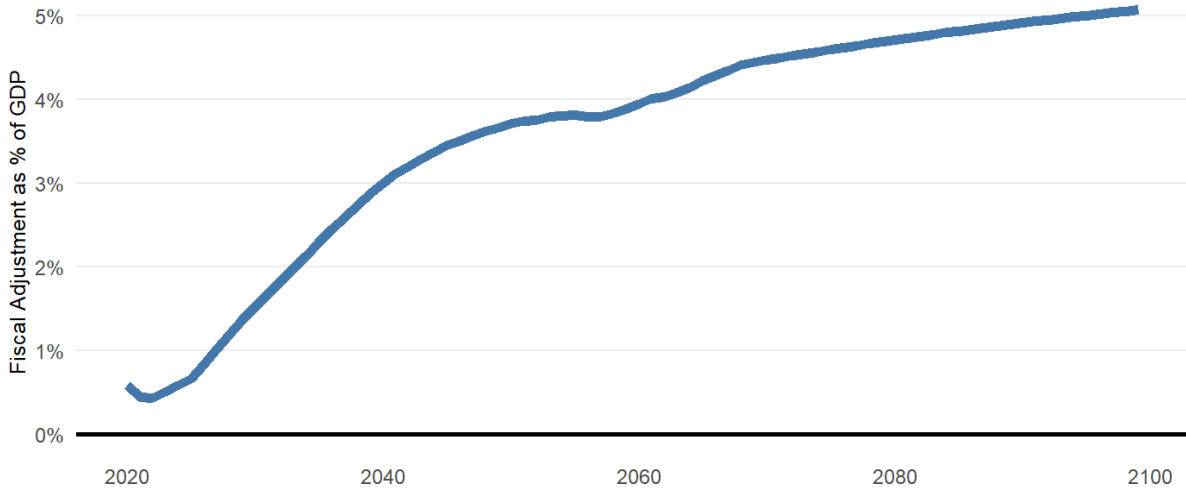
**(a) Net Debt-to-GDP Projection**

Note: Displays the projected net debt to GDP with gradual fiscal adjustment that allows net debt to GDP to rise to 40% before gradually declining thereafter.



**(b) Gradually Increasing Fiscal Adjustment**

Note: Displays the magnitude of gradual fiscal adjustment over time that allows net debt to GDP to rise to 40% before gradually declining thereafter.



Allowing debt to rise in the medium term implies lower upfront fiscal adjustment. In panel (b) of Figure 14, I illustrate that less than 1% of GDP in adjustment is required through much of the 2020s. This amount rises over time to exceed 3% of GDP by 2040, however. Such near-term adjustment presents a potentially more politically palatable adjustment path, as only gradual increases in revenue or decreases in spending over time are required. At first, a 0.5% of GDP adjustment is equivalent to roughly one HST point, with a further increase of one-third of a point per year through to 2040. To be sure, the necessary adjustment to fiscal policy beyond 2040 is larger than if a constant adjustment were adopted

immediately, and this approach raises a host of important intergenerational equity concerns. But, overall, the total adjustment is similar across the scenarios. The gradual and accommodative adjustment path illustrated here has an average present value of adjustment equivalent to 3.2% of GDP, for example. The optimal timing of fiscal adjustment is an important question, and a wide variety of potential paths are consistent with sustainable long-run finances.

### **Policy Options to Address the Fiscal Gap in British Columbia**

The preceding analysis examines the long-run sustainability of British Columbia's provincial finances. The fiscal gap measures quantify the magnitude of adjustment to achieve various debt targets but are agnostic around whether or not the targets or the path to reach them are optimal. Social welfare and aggregate efficiency considerations may motivate more or less stringent adjustment over different time horizons. In this section, I explore a variety of policy options to ensure B.C. finances remain sustainable and then proceed to explore the scope for potential increases in social spending. I report the resulting effect of each selected option on the 20-year fiscal gap in Table 4 below.

Tax changes to maintain the revenue-to-GDP ratio would imply sales tax increases over time to compensate for slower revenue growth elsewhere. By 2025, it would imply a sales tax rate of nearly 8.5%. By 2040, the rate would be over 12%. And by 2060, the rate would be 15%—or more than double its current 7%. Structured as an HST, this 2060 rate would be roughly 12.5%, in addition to the 5% federal GST. If sales taxes were instead increased immediately and permanently, a 1 percentage point increase would shrink the 20-year fiscal gap by 0.3 and a 3 percentage point increase would shrink the gap by 0.9. On a modest but related note, if housing starts kept pace with overall population growth, then the model would predict that property transfer tax revenues maintain their real per capita levels. Such growth would shrink the fiscal gap, both the 20-year and 40-year gaps, by 0.2.

Broad-based tax reform to eliminate inefficiencies and boutique tax credits within the current system is another option to increase revenues. The total cost of the film and television tax credits in 2018/19, for example, was \$888 million. The provincial sales tax also exempts many items that the GST does not. Adopting a BC-style value-added tax, as recommended by the 2016 Commission on Tax Competitiveness, could be revenue neutral at a 5.2% rate relative to the current 7% PST. The latest data for 2018 suggests a PST that mirrored the federal GST would be revenue neutral at 5.7%. Reforming the PST but keeping its current 7% rate would increase B.C. government sales tax revenue by 20%—equivalent to \$1.5 billion in 2019/20. An HST of 7% would address the full fiscal gap. Although instead of raising sales tax rates, British Columbia could also expand the sales tax base. By harmonizing once again with the federal GST, the combined sales tax rate could remain at 12% (7% provincial and 5% federal) and yet the fiscal gap would decline by 0.5. Thus, sales tax reform can address roughly one-seventh of the overall fiscal gap to mid-century.

Increasing income taxes is also a possibility, though even large increases would only modestly reduce the measured fiscal gap. Increasing personal income taxes by 10% across the board, the 20-year fiscal gap would decline from 2.8 to 2.5. Increasing income taxes by 25%, the gap would decline to 2.0. To cover the entire long-run fiscal gap, personal income

**Table 4***Revenue and Spending Measures to Close the Fiscal Gap*

Policy Options	Reduction in the Fiscal Gap	
	20-Year Gap	40-Year Gap
Increase Total Revenue with GDP	-0.9	-1.5
Maintain Housing Starts Per Capita	-0.2	-0.2
1% HST	-0.4	-0.4
3% HST	-1.2	-1.2
7% HST	-2.7	-2.8
Sales Tax Reform (7% Rate)	-0.5	-0.5
10% Higher Personal Income Tax Rates	-0.3	-0.3
25% Higher Personal Income Tax Rates	-0.8	-0.8
15% Lower Program Spending	-2.3	-2.5
10% Lower Health-care Spending	-0.7	-0.8
No Health-Care-Specific Inflation	-0.7	-1.3
Nominal Freeze in Other Spending	-1.1	-1.8
\$11 Billion Immediate/Permanent Cut	-2.8	-2.9
5% Federal Transfer Growth	-0.3	-0.7
6% Federal Transfer Growth	-0.6	-1.4

taxes in British Columbia would need to increase by nearly 95%—or nearly double their current levels.

Turning to the spending side of the provincial budget, lower growth also helps close the fiscal gap. If health-care spending increased only with population, demographics, and general inflation, the 20-year fiscal gap would decline by 0.7 and the 40-year fiscal gap would decline by 1.3. This is notable. A 1% slower annual growth rate is significant, but measures to achieve this lower growth would yield important fiscal benefits over the long run. If health-care spending grew at its baseline projected rate, other spending restraint could also help close the gap. A nominal freeze in other program spending—which would represent unprecedented levels of restraint and significant real per capita reductions—would lower the 20-year gap by 1.1, the 40-year gap by 1.8, and the 60-year gap by 2.2. And for perspective, an \$11 billion immediate and permanent spending reduction would address the entire fiscal gap to 2040.

The federal government may also have a role to help address provincial fiscal imbalances. All provinces (with the possible exception of Quebec) face long-run fiscal gaps, largely driven by rising health-care costs. Federal transfers are currently on track to represent a declining share of overall provincial health spending. Increasing the pace of federal transfer growth, through an expanded Canada Health Transfer, for example, may help bridge the gap. If federal transfers to British Columbia increase at 5% per year, the 20-year fiscal gap falls by 0.3. If transfers increase at 6%, the gap declines by 0.6. Federal transfers that grow overall at the same pace as B.C. health-care spending would decrease the 20-year gap by 0.4 and the 60-year gap by 0.8. Although increased federal transfers are not the entire solution, they could meaningfully contribute to helping provincial governments achieve more sustainable finances over the long run. To be sure, the way in which federal transfers are financed also matters for provinces, as growing federal taxes may shrink provincial tax bases. But as the PBO fiscal sustainability reports regularly find, federal finances are projected to see increasing primary surpluses, some of which could sustainably be transferred to subnational governments.

Gradual and sustained action over time may ensure the required adjustments are modest. If health-care cost increases are limited to population, demographics, and general inflation (that is, no additional health-care-specific inflation) and if total revenue keeps pace with GDP growth, then the 20-year fiscal gap is not only dramatically reduced but the 60-year fiscal gap is fully eliminated. In this scenario, net debt to GDP peaks at roughly 25% before declining thereafter. The 80-year fiscal gap in this case is -1.2% of GDP. This finding implies there is scope to increase spending or decrease revenue by that amount and still ensure sustainable finances in the province. The scope for such new initiatives will be explored more concretely next.

### **Scope for New Initiatives**

British Columbia's current fiscal situation is not sustainable. An increase in revenue or a decrease in spending is required to ensure future debt obligations do not grow without bound. This does not imply new large-scale spending initiatives are infeasible, however. Instead, it implies that spending reductions elsewhere or larger revenue increases are required to maintain fiscal sustainability.

The sustainability of a B.C. basic income would depend on its aggregate cost, and the implications of the program for spending in other areas. For the purposes of the following scenario analysis, I use various basic income costing scenarios from Green et al. (2020) and presume their estimated aggregate cost grows with aggregate GDP. The aggregate costs, in billions of dollars per year and as a share of GDP, are reported in Table 5. The aggregate costs of the selected scenarios range from 0.5% of GDP in the case of a modest refundable tax credit with a high reduction rate to over 19% in the case of a large universal basic income. To these costs must be added the roughly 3% fiscal gap estimated in the prior analysis that reflects the baseline fiscal situation of the province. For perspective, that fiscal gap is equivalent in magnitude to a universal basic income program of \$3,000 per year per individual.

**Table 5***Selected Basic Income Costing Scenarios (Green et al., 2020)*

Basic Income Type	Payment Per Person	Aggregate Cost	
		\$ Billions	Share of GDP
UBI, Individual	\$1,000	3.0	0.9
UBI, Individual	\$5,000	15.2	4.8
UBI, Individual	\$10,000	30.5	9.5
UBI, Individual	\$20,000	61.0	19.0
RTC, Individual, 30% Reduction Rate	\$5,000	2.2	0.7
RTC, Individual, 30% Reduction Rate	\$10,000	7.5	2.3
RTC, Individual, 30% Reduction Rate	\$20,000	26.7	7.3
RTC, Individual, 50% Reduction Rate	\$5,000	1.6	0.5
RTC, Individual, 50% Reduction Rate	\$10,000	5.0	1.6
RTC, Individual, 50% Reduction Rate	\$20,000	17.5	5.5

Note: Own calculations using the Universal Basic Income (UBI) and Refundable Tax Credit (RTC) scenarios of Green et al. (2020).

Offsetting these costs may be reductions in spending elsewhere, such as lower spending on social assistance, child welfare, health, justice, and so on. If the growth rate of health, social, and all other program spending falls by 0.5% from 2020 onwards—which is a substantial reduction—the fiscal gap to 2100 declines from 3.3% of GDP to 1.2%. Such a reduction would offset an increase in new social spending on the order of \$6 billion per year initially. To offset new spending on the order of \$24 billion (a \$18,000 per year refundable tax credit scenario with a 30% tax rate) would require the health, social, and all other program spending growth rate slow by more than 3 percentage points per year compared to the baseline projection. In such a situation, health spending as a share of the B.C. economy would fall from 7.5% today to less than 4.8% by 2040. This is not plausible. The effect of a basic income program on spending growth rates may offset some of the long-run fiscal implications of the program but is unlikely to offset all of them.

Revenue is another tool to sustainably fund a new basic income program. A new program on the order of \$13 billion (or 4% of GDP) would increase the fiscal gap to roughly 7% of GDP. To address this gap, one would require a sales tax increase of roughly 23 percentage points or more than a tripling of personal income taxes. This increase would be difficult in the short run. Some combination of new revenues and spending growth reductions could address the fiscal gap and allow for sustainable new program spending. If, for example, the entire social assistance program were eliminated, half the child welfare spending eliminated, and health, social, and other program spending growth were 0.5

percentage points lower, then a universal basic income of \$10,000 per individual could be sustainable (in the sense of not adding to the fiscal gap) in combination with a 2 percentage point increase in sales taxes. The elimination of social assistance and half of child welfare payments reduces the fiscal gap by 0.8% of GDP alone. There is significant uncertainty around these estimates, as the effect of basic income on future health and social spending is not well understood. I illustrate a potential set of possible revenue and spending growth projections in Table 6. Although here the potential spending reduction scenarios are somewhat contrived, they reveal the relevant magnitudes involved.

**Table 6**  
*Effect on the 40-Year Fiscal Gap*

	Change in Health, Social, and Other Program Spending Growth				
Increased Sales Tax (Percentage Points)	-0.1%	-0.2%	-0.3%	-0.4%	-0.5%
1 p.p	-0.6	-0.8	-1.0	-1.3	-1.5
2 p.p	-0.9	-1.1	-1.4	-1.6	-1.8
3 p.p	-1.2	-1.5	-1.7	-1.9	-2.2
4 p.p	-1.6	-1.8	-2.0	-2.3	-2.5
5 p.p	-1.9	-2.1	-2.4	-2.6	-2.8

The effect of a new program on labour force participation rates and labour productivity growth is also important to consider for its long-run sustainability. Earlier, in the sensitivities around the baseline fiscal gap estimates, we saw that a 0.5% increase in the labour productivity growth rate would reduce the 40-year fiscal gap by 0.6% of GDP. This would also decrease the 80-year fiscal gap by 1.1% of GDP. To be sure, a 0.5% increase in productivity growth is massive and far beyond the scope for reasonable increases due to a basic income program. But a 0.1% to 0.2% of GDP reduction in the fiscal gap per 0.1% per year change in the long-run growth rate is an important relationship to consider when evaluating the sustainability of such a program.<sup>6</sup>

### Conclusion

An aging population and declining real-estate activity may, over the medium and long run, create fiscal pressures that current policy in British Columbia is not well equipped to handle. This paper estimates the long-run fiscal outlook for the province and finds its status quo fiscal policy unsustainable. Immediate and permanent increases in revenue or

<sup>6</sup> Increases in labour force participation will have the same effect on the long-run fiscal gap as increases in labour productivity reported here. This is because aggregate GDP equals the product of labour productivity, labour force participation, and population.

decreases in spending on the order of 3% of GDP are necessary to ensure B.C.'s debt-to-GDP ratio does not grow without bound. This is equivalent to increasing sales taxes by over 8 percentage points or decreasing program spending by nearly one-fifth. Roughly half the long-run gap between projected revenue and spending is due to total revenue growing more slowly than overall GDP and the other half due to health-care costs rising more quickly. If revenue kept pace with GDP and if health-care costs increased 1% slower than projected, then the projected net debt by 2060 in British Columbia would be similar to its current level. That is, its finances would be sustainable. This report explores several long-run fiscal scenarios to examine the challenges facing the province and its capacity for new large-scale spending initiatives, like a basic income program.

These projections are not predictions, as any number of eventualities may improve or diminish B.C.'s future fiscal health. But planning for the future requires a clear understanding of where current policy is pointed, and what factors to anticipate. Gradual changes made today—to ensure revenue keeps pace with economic growth and health-care cost increases are moderated—will not only ensure fiscal sustainability over the long haul but also allow the province to consider expanding social spending programs in a responsible manner.

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