Response to Reviewers

Bev,

Thank you for the opportunity to revise my paper on Alberta’s long-term fiscal future. I also wish to deeply thank the referees for terrific comments that lead to a substantial revision of the paper. I believe you will agree that their feedback has significantly improved the quality and clarify of the paper. I detail my responses below.

First, let me highlight some of the major changes. The key modeling changes include more revenue components, such as property taxes, tuition revenue, ALGC income, tobacco and cannabis taxes. I further disaggregated spending to include education, advanced education, and the climate leadership spending. I made these changes in response to some referee comments, as well as feedback I received from an individual I sent the paper to myself.

Second, in response to one of the referee comments, I adjusted the capital plan projection to better reflect historical data. I also improved the assumptions behind healthcare inflation and education real-wage growth to be more consistent with historical data.

Finally, I reformulated the key results (and indeed the entire paper) to incorporate the excellent suggestions of referee D. In fact, this referee highlighted ways in which my prior analysis was out of step with the existing literature, and potentially misleading to readers. I thank him or her for the detailed review of my first draft and hope the referee agrees the revision is substantially improved. I now estimate the ‘fiscal gap’ in a manner consistent with their recommendations, and the discussion and presentation of the analysis and results reflect that. It led to interesting new results, and a sharper and clearer paper.

In what follows, I provide point-by-point replies to referees B and C. I believe I have responded to each of the substantive issues raised, with one exception: I endeavoured to shrink the size and scope of the paper – and succeeded in many ways – but the new analysis motivated by Referee D, combined with (sensible) requests for additional description and context in certain areas, meant I did not succeed in shrinking the paper’s overall length. Nevertheless, I believe it is sharper than before and more efficiently communicates much more information than the original draft.

Also, please note that I do not provide a point-by-point response to Referee D, since his or her comments were more open-ended and conceptual. Suffice it to say, I believe I have fully responded to their concerns with a completely overhauled paper that reflects their recommendation to redo the analysis based on the traditional fiscal gap measure. Also, for this reason, the “revised paper” file does not highlight changes in yellow. That was not feasible given the major revisions that I undertook.

# Responses to Referee C

The referee comments are enumerated below and my responses follow in bold.

1. I like the idea of taking a longer term perspective, but going out to 2040 is far enough. As the author notes, projecting past 2040 requires different data and assumptions. Further, it is much more easy to ignore problems that are far in the future, while 2040 is close enough in time to be pertinent to current voters. Most of the analysis concentrates on the 2040 projections, so the projections to 2100 do not add much. Further, use of the two end dates is somewhat confusing because some projections are made up to 2040, then some are made to 2100, and then others are made to 2040. The ordering of the discussion with the two end dates is not consistent. The projections to 2100 distract from the main analysis. Eliminating these projections would allow the paper to be tightened up and shortened. It is already a long read and forecasts 80 years in the future are not particularly believable. Such forecasts are equivalent to a prediction in 1940 of Alberta’s budget situation today.

 **I appreciate this point. I re-wrote much of the report to move the projections beyond 2040 to within the long-term debt sustainability section only. This deemphasizes individual revenue and spending components beyond that time frame. I also included on page two of the introduction a clear statement that projections are not predictions. But long-term projections of sustainability are critical to understanding current policy. Many jurisdictions do such exercises precisely for this reason. I therefore keep the longer-term forecasts within the debt sustainability section. This matters in particular because 2040 is not “long enough” a perspective to ensure sustainable debt levels, as I demonstrate in Section 5.**

2. Too many different metrics were used to measure the fiscal situation. I would reduce these to the minimum required to make the key points in the paper. My preference would be to use the following (or fewer) metrics: the debt-to-GDP ratio, the deficit-to-GDP ratio; the deficit as a percent of revenues; debt service payments as a percent of revenues; program spending as a share of GDP.

At times, the metrics are simply overwhelming. The text mentions the “budget balance”, the budget balance excluding royalties, deficits, primary deficits, the fiscal gap and the primary fiscal gap as well as some of these as a percent of GDP and/or revenues and/or program spending.

I did not find the comparison of the present values of revenues and expenditures useful. It is difficult to know how to interpret these or what precise message they give to policy makers. Average deficit per year would be more useful.

I was not sure whether “taxes and other revenue” is total revenue or revenue less resource revenues or something else.

 **I have revised the paper to focus on the net debt to GDP ratio and the fiscal gap (now redefined in this revision). Other budget metrics are presented in Table 3 but are not emphasized elsewhere. This still provides information to interested readers, but sharpens the exposition and overall message.**

3. While I understand the rationale for the use of a fiscal gap measure which ignores resource revenues, I am not convinced that Alberta policy makers or voters will see this as a useful concept. Yes, it would have been better if Alberta had invested resource revenues in a wealth fund and only extracted the real return, but they did not and I do not see any Alberta government ignoring resource revenues when determining the budget stance or policies to generate a sustainable budget. There is also no indication of significant depletion in bitumen supplies, so production and resource revenues are likely to continue for many years. I would much prefer a focus on a budget balance measure that incorporates a reasonable estimate of resource revenues rather than a balance that ignores these revenues. I believe that such an exercise would be much more useful from a policy perspective and would make the analysis much more difficult to dismiss. Use of the fiscal gap measure that incorporates non-resource revenues only, so excludes one of the province’s largest revenue sources, makes the analysis much more academic, but less relevant to politicians and the public.

 **I have de-emphasized the budget metrics that exclude royalty revenues. I’ve redefined the “fiscal gap” measure throughout the revision to be based on all revenues. I still present the reader with the size of the gap “excluding royalties”, but it less of a focus. More emphasis is now placed in Section 5 on what royalty revenue volatility means for future debt levels.**

4. I found the metric “controllable revenue”, which excludes resource revenues, investment returns and federal transfers, to not be particularly useful. Why add one more metric? It could be argued that many of the other sources of government revenue are not controllable, since the government can control only the tax rate and the definition of the base, not the size of the base. For example, to what extent are corporate tax revenues controllable.

 **I have removed this metric, and am convinced by this referee’s comment that it was not conceptually coherent either.**

5. I found the assumptions required to make the projections to be reasonable. It is a good idea to take forecasts from other agencies/institutions that specialize in making forecasts. Whether it would be better to use the same sources of data for the whole period, rather than using the Government’s budget projections for the first few years is an issue to consider. My preference would be to not use the forecasts from the Government’s recent budget.

 **My preference is also not to use the Government’s own budget projections. It is difficult to use a single source for projections over the whole period, since different sources focus on different objects. The conference board is useful for macroeconomic variables such as GDP and interest rates, for example, and their population projections are not disaggregated by age.**

6. Figure 11, page 26. It would be informative to explain the rapid fall in program spending through the early 2020s. Is this due to the use of the Alberta government budget projections? Is this decline believable given Alberta’s recent spending growth? Also, what is driving the long run gradual decline in program spending and non-resource revenues?

 **This is an important comment. I have added an explanation for the drop in program and total spending displayed in (now) Figure 9. Spending is actually rising over this period, but the above-average rate of nominal GDP growth as the province comes out of recession is the cause for the decline in spending as a share of GDP. Similarly, the large increase in spending as a share of GDP is also due to the recession. I’ve added a brief explanation of this at the beginning of Section 3 when the figure is first introduced. Revenue as a share of GDP does not rise because royalties fell by so much. To the point on the gradual long-run decline in spending, this was due to a rather aggressive assumption around zero real wage growth in health of education. Based on comments from others, this has since been changed. The decline in gradual long-run decline in revenue remains in the revision for a few reasons. First, royalties are projected to grow faster than GDP in the coming years, but taper off. Second, other revenue components, such as investment income, federal transfers, property tax revenues, AGLC/Tobacco/Cannabis revenue, and carbon tax revenue are all projected to grow at rates below overall GDP. I’ve added a brief note to this effect neat the beginning of Section 3.**

7. A discussion of policy changes that could eliminate the fiscal gap is provided In the final section of the paper, starting on page 39. On the surface, these policy changes do not look that difficult, so the solution to the budget problem appears to be relatively easy. I don’t think this is the case, but this is not evident if these policies are not put into context. If a particular growth rate of expenditures is required, how does this compare to the actual growth rate over the past 20 years. How big a change to behavior would be entailed by the change in policy? If increases in taxes are required, can these be compared to the tax burden over the previous 20 years? The tax and spending solutions may be painful when compared to the past, so putting these in context, to clarify the magnitude of the change required, would be useful. The end of the final paragraph on page 40 is a good example of this context, but more is needed when each of the different options is discussed (such as all the policy options given in Table 6 on page 41).

Figure 15 on page 35 shows how it is possible to achieve a constant or falling debt-GDP ratio. The problem is that it is not clear how difficult this would be. This is where a comparison to past experience would be useful.

 **This is an important point. The spending and revenue measures required to put Alberta’s finances on a sustainable future are, to be blunt, massive.** **This is not immediately clear, however, when one says “hold spending growth roughly in line with prices and population growth”. Sustained by 2040, this implies program spending of less than 12 per cent of GDP – far lower than any other provinces and lower than Alberta has seen since the 1950s. I endeavoured to provide richer historical context for many of the proposed options described in Section 5, and I also provided a comparison to the Klein fiscal adjustments in Section 4.**

8. I thought the text could be tightened and shortened with better focus on the key message.

 **An important comment. I have significantly re-wrote the paper, and it hopefully flows better. I have also relegated the algebra to an appendix so as to not interrupt the flow. Notably, I consolidated the royalty and healthcare discussions, which were previously separated across the “where are we now” and the “medium-run projections” scenarios. Now they are in one. But, to be clear, the paper is no shorter than the initial draft. Indeed, it is slightly longer. Referee C provide a number of important comments that motivated a complete overhaul of much of the analysis. I hope the text is tighter and more focused on the key message, but it is no shorter. I keep the component-by-component description of forecasting assumptions in the main text. This could be moved to an appendix, though I feel the forecasting assumptions are important to keep front and center. I’ll leave this to the editor’s discretion.**

9. I liked Figure 1 except that, while capital spending is mentioned in the text (line 194), it is not given in this figure.

 **Capital grants were added to Figure 1. I also provided a brief comment early in Section 1 regarding these capital grants.**

10. I found Figures 5 and 6 to be informative. These show that much of Alberta’s problem is related to allowing health costs to get out of control (without any obvious evidence of better outcomes). Lines 817-26 on pages 41-42 discuss where the current Alberta budget situation would be if health spending had been similar to spending in other provinces. Rather than discuss Alberta’s spending on health as being an outlier on pages 12 to 15, and then relate this to the current budget situation on pages 41-42, would it be more appropriate to discuss the budget implications of the control of health spending in one place? I would suggest in the section where policies to address the unsustainable budget balance are discussed.

  **I have combined the health spending and royalty revenue sections with the medium-run projections sections. This hopefully improves the flow of the paper. And, following this specific suggestion, I have moved the part about Alberta’s out-of-line health spending to follow the “options” to close the fiscal gap.**

11. I was not sure of the importance/contribution of the range for royalties reported in Figure 8 on page 18, or how this range relates to the simulated paths for royalties that drove the simulated budget balance scenarios in Figure 17 on page 38. Would it be useful to report in Figure 8 the simulated royalty scenarios used to create Figure 17 rather than include the current unexplained range of values in Figure 8? Would it be better to eliminate the range of values from Figure 8 since these are not discussed in the text?

 **I changed the figure to show the baseline projection, and the “optimistic” one based on the slightly more aggressive near-term projection by the Government of Alberta.**

12. The methods used to estimate the future revenue and spending growth rates seem generally reasonable. In some cases, the assumptions are related to behavior over the past twenty years and in others they are not. It would be useful to compare the assumed values for all the key variables used in the projections to the actual values averaged over the past twenty years. I did find it odd that resource revenues will grow faster after 2040 than between 2030 and 2040. I am not sure why this would be the case. Also, I am not sure how reasonable the constant real per capita capital expenditure assumption is and how it relates to past behavior.

 **I have added new variables and adjusted the assumptions behind the projection. I have also added brief descriptions for how certain projection assumptions relates to observed behaviour over the past 30 years. In particular, I do so for education, capital spending, and income tax revenue. Also note that resource revenues were never projected beyond 2040. I ensured the language on that point is clear. Regarding capital spending, the referee raises a good point. I change this assumption to better reflect the historical experience and hold capital investment levels proportional to GDP.**

13. There are a number of places in which there are words missing, minor typos or phrasing that is unclear. Better proof reading is required.

 **An important comment. In addition to my own re-reading and re-writing, the School hires external editors prior to releasing its research papers.**

14. Page 23. Are the “Total Revenue” and “Total Spending” growth values in Table 2 the weighted average of the individual revenue and spending components or something else? A note should clarify.

 **I have changed the table to make clear both total revenue and total spending are the combined aggregate of the individual components. They are isolated on the bottom two rows of the table, and separated from the other components with an explicit note.**

15. I am not convinced that Figure 12 on page 29, referred to as Figure 13 in the text (line 589) is useful. Also, the title is misleading as it seems to imply that this is Alberta’s reliance on resource revenues when the projection, to my understanding, is the sum of actual resource revenues and the budget deficit, not revenues from resources. I would have one line for the resource revenue projection used in the rest of the paper and another line for the resource revenue projection plus the value required to balance the budget. However, this figure is probably not useful enough to include.

 **The figure is removed.**

16. Table 5, page 29, is titled “Selected Choices to Shrink the 2040 Fiscal Gap”, but this table appears to present results for a sensitivity analysis, not the impact of different policies.

 **The table is now redesigned, and includes many specific policy options.**

17. The algebra on pages 31-33 could be relegated to an appendix as it is relatively standard and provides more detail than required. A brief intuitive explanation could be included in the text.

In this section, several alternative methods are included to examine the sustainability of the fiscal plan. Are they all needed? I prefer the debt-to-GDP discussion in lines 695 – 702. This discussion deals with the issue in terms that can be understood by anyone.

 **I have changed the debt sustainability algebra substantially. I have also moved it to the appendix to hopefully improve the flow of the paper.**

18. Pages 37-39. The impact of volatility on the range of possible budget balance outcomes is interesting and shows that the actual outcome may be far from the baseline projection. In fact, given the relative values of the median and baseline projection, the outcome is likely to be worse than the baseline projection. Although, it was not clear whether the median and baseline projections were calculated under the same assumptions, so they may not be directly comparable.

One shortcoming of this volatility analysis is that it only takes into account the volatility of resource revenues, while all revenues are volatile and several types of revenues are correlated with resource revenues. If the author does not want to simulate multiple sources of revenues, allowing for their correlation, which could be done using a VAR simulation, it might be more illustrative to allow total revenues to be volatile and to simulate total revenues. The advantage of simulating total revenues is that it allows all revenues to be volatile rather than allowing only resource revenues to be volatile and restricting all other revenues to be non-stochastic.

 **This was a very helpful comment, thank you. I have redone all of the volatility analysis and believe it is now substantially improved. Following the reviewer’s comments, I simulate a process for the net debt to GDP ratio itself, with a stochastic term that matches the historical data. This reflects Alberta’s actual budget volatility.**

19. Policy recommendations, page 44-45. The first three policy recommendations are generally reasonable, although they are not explicitly linked to the preceding analysis. For example, why targets? The paper does not discuss the benefits or downsides of targets, nor link them to the analysis, but imposing targets is one of the policy recommendations.

The fourth and fifth policy recommendations are problematic. I am not sure what the author means by the fourth policy recommendation: “Report”. What are the “previous objectives” and how can the “effectiveness” of each policy measure be evaluated? Also, recommendation 5, “Innovate”, requires a measure of “when measures do not work.” How do we know when the measures do not work? This is not discussed anywhere in the analysis.

 **I changed the concluding sections accordingly. I have backed away from such specific procedural recommendations by merely embedding them within larger sentences. I end the piece with a call for others to explore the pros and cons of various routes forward.**

20. Since the text related to Figure 11 on page 26 discusses the budget deficit and the fiscal gap, these should be incorporated in Figure 11.

 **I have changed the Figure (now number 10) to include both the revenue and spending values in one panel, and the budget balance and debt service costs in another.**

21. When discussing the revenue volatility issue on line 771, the author indicates that the fiscal path is “unstable”. I do not believe that this is what Figure 17 on page 38 implies. Figure 17 shows that there are a wide number of paths that budget balances could take, but many of the balances do not look particularly volatile. There are a wide range of possible future paths, but each of these paths is not necessarily unstable.

 **An important point. I have changed the language.**

22. Table 3, page 27, has numerous metrics, but little discussion of the importance of these metrics and what they tell us. How do these compare to the past? To other provinces?

 **I expanded the discussion around these and other budget metrics.**

23. The different policies to address the fiscal problem, which are summarized in Table 6 on page 41 and in the related text, should be compared more carefully against each other. I was not clear of the pros and cons of the different policies and which the author preferred, if any. The policy conclusions and recommendations also did not identify one of these approaches as the preferred approach. The paper identifies a fiscal problem. Should it not recommend the best policies to address this problem? While there are different approaches – higher taxes vs lower spending – is one approach more likely to be successful given Alberta’s fiscal history?

 **I have now explicitly recommended a set of revenue and spending measures to address Alberta’s unsustainable fiscal future and dampen its reliance on resource revenues. I highlight the “restrained spending and modest new revenue” scenario in Section 4 and the Conclusion. But, I put greater emphasis on the need for clear and detailed analysis. I’m largely agnostic about what particular mix of policies government chooses to adopt – that’s not the primary purpose of this report.**

# Responses to Referee B

I respond to the various comments in the PDF here, in order and in point form. I may have missed some comments, but endeavoured to incorporate all feedback into the revision.

* (Page 1) Expressing the debt stock relative to government revenue or per capita is less relevant to compare across time or jurisdictions than debt to GDP. Further, in response to other referee comments, I want to minimize the number of metrics floating around. As debt to GDP is the key variable to analyze long-term debt sustainability, as I try to make more explicit in the revised paper, I did not revise anything in response to the first comment.
* (Page 9) I changed the language here and moved it to the new section on volatility.
* (Page 11) The sources were added to the references. This figure has since been removed, but the sources are used in others.
* (Page 12) The figure is the spending per capita within each age group, not the distribution of total spending across age groups. I changed the figure’s title to make this clearer.
* (Page 13) Yes.
* (Page 20) An important comment about the share of the population in the labour force. I added a new figure that displays the projected number of working-age individuals per 65+ person. The referee is correct that the health spending increases are partially offset by future productivity growth. I added a clear comparison between health spending growth and overall GDP, and note the implied spending to GDP ratio – which rises 1.5 points. Though this may not sound large, it is. It’s equivalent to more than a 5 per cent sales tax, for example.
* (Page 20, second comment) I provide a more detailed description of the “other factors” contributing to health care spending increases. The other factors are indeed expected to increase faster than inflation in other models. My assumption is conservative by comparison.
* (Page 23) The various corrections are made in the revision. Thank you for catching them.
* (Page 24) I provide a more detailed description of the capital plan assumptions. The reviewer is correction that capital spending need not increase debt levels at all times; though in the model does in every period given the negative budget balance overall.
* (Page 25) Fixed.
* (Page 26) These are important clarifying points. I have substantially changed the language and ensured all terms are appropriately defined prior to their use.
* (Page 32) I replaced the algebra with a different – hopefully clearer – model and relegated it to the appendix. The intuition that “debt to GDP cannot rise without bound” is sufficient for the main text.