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ALBERTA'S ECONOMIC AND FISCAL FUTURE

Edited by
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PREFACE

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

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

It is in this context that we commissioned a series of papers from authors covering a broad range of expertise, experience and community leadership to discuss Alberta's economic and fiscal future. The authors were given wide latitude but in general we asked them for their assessment of the short and longer term challenges and opportunities for recovery to sustainable prosperity. These papers were released as pre-publications as part of the School's Alberta Futures project and are now bundled as chapters in this ebook. While the list of important issues goes well beyond the topics covered here, our hope is that the thoughtful evaluations presented will assist in motivating important public discussions on Alberta's economic and fiscal future.



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CHAPTER 1

INTRODUCTION AND OVERVIEW

Robert L. Mansell and Kenneth J. McKenzie

The genesis of the Alberta Futures Project was a proposal developed by our colleague Bev Dahlby. The basic idea was to explore the challenges and opportunities associated with the twin crises precipitated by fundamental changes affecting the province's oil and gas sector and by the COVID-19 pandemic. Both have had major economic and fiscal impacts that have yet to fully play out. More concerning is that they have exposed fault lines that threaten the province's long-term economic and social prosperity. Given the direction of environmental policies it now seems unlikely that the oil and gas sector can continue to be the key driver of the province's growth and provide the large resource revenues that for many decades have underpinned the Alberta tax advantage. But there are other compounding trends. For example, the province faces: a secular decline in economic growth rates; the onset of significant demographic shifts; the associated increases in demands for provincially funded public health and social services; generally lagging productivity; an acceleration in the rate of technological change; and, significant barriers to trade. At the same time, however, these circumstances of rapid and disruptive change will create many new opportunities.

Successfully meeting these challenges and seizing opportunities will require considerable collective thought, analysis and discussion by Albertans, combined with strong community and provincial leadership. It is to help promote this thought and discussion that we commissioned 27 authors to provide their take on Alberta's economic and fiscal challenges and opportunities that will be important in achieving long-run social and economic prosperity. These authors cover a wide range of experience, expertise and perspective and they were given considerable latitude in addressing the issues, challenges and opportunities. We asked them to stay at a fairly high level in discussing their particular topic but still provide basic analysis and references to support their arguments.

While the following chapters cover a broad range of topics related to Alberta's economic and fiscal future, some common themes emerge. We summarize just a few of these themes here.

One dominant theme is that Alberta's economic and fiscal futures are closely linked. The province's fiscal health will depend to a large degree on the performance of the economy and the latter will be influenced by the province's finances, particularly as they play an important role in defining the investment climate and as they provide the funding for policies to assist the recovery, transitions and long-term growth. Further, strong provincial finances will be required to support the large public sector providing health, education, social and other services important for a vibrant and healthy population and economy and especially important for support of adaptation, innovation and investment.

A number of the papers also emphasize the critical need for changes to support economic growth, especially in areas where Alberta strengths and emerging opportunities exist. This is not just to address structural shifts and their impacts on employment opportunities but also because employment and income opportunities play such a key role in determining poverty rates, social and labour market equity and overall well-being of the population.

In discussing the significant factors that will determine the province's economic success numerous authors highlight entrepreneurship and innovation. The general argument is that Alberta has real advantages in this area. Based on demographic, cultural, industrial structure, economic variability and other factors, the province's superior abilities and willingness to innovate and adapt must be protected and encouraged as these are extremely valuable attributes in a future with many great uncertainties and adversities.

Another theme echoed in numerous papers is that Alberta needs to focus on improving the investment and economic climate, especially through reducing regulatory hurdles, enhancing access to labour through training and technology, working more closely with job creators and communities across the province, increasing access to risk capital, reducing trade barriers and rebalancing federal policies to decrease the fiscal drag on the Alberta economy. Several papers also focus on creating an optimal future path for the energy sector that includes adaptation, innovation and collaboration and a greater willingness of regions and governments to work together for the best interests of all stakeholders.

Another theme in many of the papers is that a high priority must be placed on restoring the sustainability of the provincial government's finances. In general it is argued that there is a fiscal reckoning underway that must be addressed sooner rather than later to avoid damaging consequences for the province's future. They point out that Alberta has numerous revenue and expenditure options to address the gap that threatens fiscal sustainability but that it will require eliminating certain 'fiscal illusions' and it will take strong and enlightened leadership with a focus more on the long-term social and economic future of the province.

We now turn to a quick summary of the chapters. Our purpose is simply to provide the flavor of the various views on Alberta's economic and fiscal future. However, it must be emphasized that these overviews do not do justice to the quality and range of the thoughts by the authors so careful reading of the individual chapters is recommended.

Danielle Smith's chapter begins with the observation that Alberta is quite different from most of the other provinces, particularly in terms of its settlement and development history. This has created an entrepreneurial and communal character that she argues is Alberta's most precious resource, and instrumental in the resilience and success of its people. However, she argues that this character has yet to permeate government, where innovation is required to address many of the issues in the public sector and where strong fiscal stewardship is often lacking. Danielle argues for weaning Albertans off their energy royalty dependence, re-building the Alberta Heritage Savings Trust Fund, increased reliance on user fees and re-engineering the delivery of government services.

In his chapter Todd Hirsch outlines the shifts in Alberta's labour markets as a consequence of energy price declines and the pandemic. He concludes that the decline in energy sector employment is likely permanent. While there has been significant growth in jobs in the public sector, jobs in the more traditional sectors like energy, agriculture and tourism have fallen. To this point there is limited evidence of increased employment growth in emerging industries like tech, life sciences and financial services

but very recent trends are encouraging. He suggests that a bright economic future for the province will depend on improvements in the business environment to boost efficiency, competitiveness and productivity and on the adoption of key priorities, values and principles. These include a high priority on education, on fostering social inclusivity and diversity, upholding Alberta's reputation and improving its brand and looking more positively to the future to help shake off nostalgia for the past.

As a long-serving president and CEO of the Alberta Chambers of Commerce, Ken Kobly brings a broad business perspective based on the views from over 120 community-based chambers covering more than 24,000 businesses across the province. Using data gathered from recent surveys, he provides considerable detail on the challenges, opportunities and views on policy priorities as seen by this broad cross-section of communities and businesses. In summary, there is wide agreement on the key challenges and on what will be required to achieve economic recovery and longer term prosperity. This includes a focus on achieving long-term fiscal stability for government, more diversified revenue opportunities, increased government engagement, enhanced skills training and a more competitive regulatory environment. In general, active engagement with and participation of the job creators in the many businesses and communities across the province will be important in achieving a prosperous economic future for Alberta.

The twin energy price and COVID-19 crises involve potentially important differences in the labour market impacts across various socio-demographic groups. The chapter by John Baker, Kourtney Koebel and Lindsay Tedds focuses on these differential effects associated with the pandemic. They provide a detailed analysis using data from the Statistics Canada Labour Force Survey. Among the results they show that the initial large differences in labour market outcomes between men and women dissipated over the summer and fall of 2020 and that there was no evidence of an on-going 'shecession' in the third wave. Their most striking result is the large differences in impacts on employment and hours worked between parents and non-parents, irrespective of gender. They also suggest that if the trends continue there may be greater labour market participation of women with young children.

Ron Kneebone and Margarita Wilkins focus on what Alberta's economic and fiscal future might mean for individuals and families living in poverty. Their analysis suggests that poverty rates in the province are closely linked to two key variables: the state of the economy and social policies regarding social assistance and the minimum wage. Strong economic performance in earlier periods and increases in social assistance in later periods have been key factors in driving down the poverty rate in Alberta. For example, they suggest that without the policy interventions after the energy price declines in 2014, the downturn in the economy would have pushed up the poverty rate to two and a half times its current value. Given the province's fiscal situation, they indicate that the province must be increasingly reliant on income and employment growth to keep rates of poverty low.

Philip Cross provides a detailed discussion and analysis of the role of entrepreneurship and innovation in Alberta's economic future. He argues that Alberta has the latent potential to successfully meet the daunting challenges associated with post-pandemic

recovery and the diminishing role of the energy sector as a key driver of the economy. This is based on an assessment of the real 'Alberta Advantage'. This includes: cultural values that encourage innovation and entrepreneurship; willingness to take risks in starting new ventures and to foster trade, competition and innovation; a young population that challenges existing beliefs; a highly cyclical economy that has fostered strengths through adversity and a willingness and ability to quickly adjust and adapt to changing circumstances. He suggests that Alberta's future economic prosperity will be primarily determined by its ability to encourage and build upon these strengths and not attempt to micro-manage the innovation process in firms and institutions.

In exploring the future of the key energy sector, Mac Van Wielingen focuses on defining an optimal transition path. He begins by setting out the new era within which the future of this sector will be determined. It involves energy abundance, accelerated technological change and environmental concerns, reconciliation with Indigenous Peoples, reduced trust, Western Canadian alienation, stagnant productivity and extreme levels of public indebtedness. Within the context of these forces he argues that we need to meet the emissions challenge head-on but also reset our priorities towards economics, competitiveness, productivity and rebuilding a sound fiscal position. He concludes that the keys to the optimal future path include adaptation, innovation, collaboration and the ability of regions and governments in Canada to work together for the best interests of all stakeholders.

The chapter by Chris Bataille, Sarah Dobson, Anna Kanduth and Jennifer Winter is centered on paths to achieve net zero carbon emissions by 2050 and the associated challenges and opportunities for Alberta. They highlight two sets of pathways to net zero. In the "Transformation Pathway", engineered negative emissions solutions and advanced Carbon Capture Use and Storage are not widely adopted and the global oil price is low. In this case there is significant curtailment in numerous sectors of the Alberta economy which necessitates a fairly rapid shift to new areas of economic activity, large changes to energy systems and broad structural change to the provincial economy. In the "Transition Pathway" these technologies are not employed and the global oil price is high. Under that scenario there continues to be growth in many of Alberta's existing sectors while simultaneously transitioning into new economic opportunities. They use this wide range covered by the paths to outline and encourage certain policy changes to maximize opportunities and minimize unnecessary disruption.

As in previous downturns, the twin crises of low oil prices and the pandemic have renewed calls for diversification to address economic instability in Alberta. Robert Mansell's chapter begins by outlining the different types of diversification and economic instability. He then evaluates the degree to which diversification is the answer to achieving greater stability. In dealing with shorter term (cyclical and random) variability he argues that effective diversification aimed at increasing stability is less likely to involve adding 'new and better' industries and more likely to involve increasing the range of goods and services produced by existing sectors and facilitating the growth and diversification of markets for all exports from the region while building competitive substitutes for imports. A broad-based-approach is preferred and will require changes to achieve fiscal stability and sustainability, improve the regulatory

and investment climate, increase access to risk capital, expand infrastructure, reduce trade barriers, and rebalance federal policies to reduce the fiscal drag on the Alberta economy. He argues that in terms of secular or long term instability, the challenges facing the province's oil and gas sector represent the greatest risk. While the province has strengths in adaptability and innovation to support a successful transition, strong leadership and consistent policies will also be important.

The financial sector is an important contributor to employment and value added (or GDP) in Alberta. Jack Mintz, Daniel Wilson and Bryce Tingle explore the possibility of significant further expansion, particularly in the entrepreneurial and growth-stage capital markets and in banking, fintech and insurance. Their analysis suggests there may be considerable potential for growth in these areas, with important positive spin-off effects for other sectors of the economy. Based on the experience in other leading jurisdictions, they outline the broad range of reforms, innovations and initiatives likely required in the province to seize existing and emerging opportunities for growth of its financial sector. Completing the analysis necessary to prioritize and evaluate possible reforms and to make recommendations for specific reforms and innovations is the focus of their current research.

Karen Spencer and Kim McConnell begin their chapter by highlighting the importance of the agri-food industry to the provincial economy. It comprises everything from farm production to food processing and beverage manufacturing and includes grocery retailing and food services. Taken together, they indicate agri-food sales in 2020 of well over \$50 billion and status as Alberta's largest employer. However their main point is that the province is well-positioned for significant future growth. The global demand for food will continue to grow and the province has the resources and innovation potential to capture the opportunities. However, they suggest that there are certain obstacles that must be overcome. These include: reducing regulatory hurdles and improving the investment climate; improving rural connectivity, enhancing access to labour through training, re-training, robotics, technology and immigration; championing agri-food; and, tackling misinformation.

The twin crises certainly accentuated the large fiscal challenges facing Alberta, including some at the municipal level. Bev Dahlby and Melville McMillan launch their chapter with an overview of municipal expenditures, revenues and responsibilities (including the major ones associated with roads and streets, fire (and often police) protection, waste management and recreational facilities) for the various municipal types in Alberta. They then focus on what they consider are the two most challenging issues. One is the balance between residential and non-residential property taxes. In general, the downturn in the provincial economy has reduced the ability of non-residential or business properties to carry the major load in terms of revenue generation while increases in residential property taxes to offset this shift face stiff opposition but will be required. The second issue concerns the taxation of oil and gas property by rural municipalities. These taxes, particularly in the context of declining oil and gas revenues, have become a major irritant and source of conflict between the province's economic engine and many municipalities.

Robert Ascah examines the run up in Alberta's public debt and the consequences in terms of critical thresholds, the impact on taxpayers and what it means for the province's tax advantage and long-term economic growth. His evaluation is informed by experience in earlier periods, including the default on the debt in the 1930s and the retrenchment in the early 1990s, and it leads to the conclusion that the province has entered a stage of fiscal reckoning. He argues that the net debt (financial assets minus liabilities) has been increasing at an unsustainable rate since 2016 and when potential environmental liabilities are included the situation is markedly worse. Among other recommendations, he suggests the need for rules to set aside significant funds each year for debt retirement to force voters and politicians to make the difficult budgetary choices to avoid a much harsher fiscal reckoning in the future.

It is sometimes argued that one reason the provincial government's per capita expenditures are significantly above those in the other large provinces is because public sector wages are too high. In his chapter, Richard Mueller compares public and private sector wages in Alberta with those in British Columbia, Ontario and Quebec. He also estimates the real (or after-inflation) wage premiums of the largest public sector occupations in Alberta relative to the same occupations in the private sector and for comparative purposes he does the same for the other three large provinces. The results indicate that real wages for the 96 largest public sector occupations in Alberta do tend to be higher than those in the three comparator provinces. However, the public sector wage premium in Alberta is not out of line with that in the other large provinces and in many cases is lower. He also finds that the adjustment in Alberta public sector compensation to reflect the contraction in the provincial economy has already begun as would be expected in an efficient labour market.

Fiscal anchors are policies that impose constraints on a government's fiscal choices to avoid a bias toward deficit financing, prevent the use of fiscal policies that increase economic fluctuations and discipline a political bias that leads to excessive spending and taxation. Bev Dahlby outlines the anchors currently used by the provincial government, those commonly used in various jurisdictions, and the relevant literature on their effectiveness and the trade offs. Based on an extensive analysis he makes four recommendations for the Government of Alberta: supplement the 30 per cent debt ratio ceiling with a limit on the increase in total expenditures to a moving average of the increase in household incomes in the province; report the primary and fiscal balance along with the budget balance in quarterly updates and the annual budget; conduct a review of the sustainability of its fiscal policies every four years; and re-evaluate and re-calibrate its fiscal anchor and other fiscal policies based on the sustainability review.

Trevor Tombe highlights Alberta's new fiscal challenges which exceed those experienced in the lifetime of most of its residents, and argues that a longer-term perspective is required to recover and ensure fiscal sustainability. This sustainability requires that the debt to GDP ratio remains bounded (not increasing or decreasing without limit). He uses a detailed model that indicates, for example, over a 10-year period the estimated fiscal gap, reflecting currently projected revenues and expenditures, is equal to 4.2 per cent of GDP. Put simply, Alberta's finances are not sustainable at present. He also uses a 25-year time horizon to trace out the risks to

sustainability for Alberta and compares it to that in other provinces. For example, the results suggest that the higher volatility of government revenues, in combination with other factors, may require a much lower debt to GDP ratio for Alberta than that in other provinces. Despite the extra challenges he suggests that Alberta has a wide range of options but good planning with a strong focus on the future is required.

Daria Crisan and Kenneth McKenzie also focus on the fiscal sustainability challenge for Alberta. Using Trevor Tombe's results, they examine the options available to close the fiscal gap equal to 4.2 per cent of GDP. Bringing per capita expenditures of the provincial government down to the average of the rest of Canada would lower the fiscal gap to 2.1 percentage points or by 50 per cent. On the revenue side, they evaluate the introduction of a sales tax, repatriation of the existing federal carbon tax, and increases in personal income tax rates. Their analysis indicates that a 6 per cent sales tax or a combination of a 2 percentage point increase in the provincial income tax rate for the lower three brackets and a 4 percentage point increase in the tax rate for the top two brackets would lower the fiscal gap by about 1.2 percentage points or approximately 27 per cent. Repatriation of the carbon tax and retargeting rebates would generate enough revenue to eliminate the remaining fiscal gap. They conclude that "the choices may be difficult, but the math is simple; and choose we must."

CHAPTER 2

ALBERTA'S KEY CHALLENGES AND OPPORTUNITIES

Danielle Smith

ALBERTA IS DIFFERENT

There is something glorious about Alberta. This province has a special culture and character that doesn't exist in quite the same way in the rest of the country.

It may be our unique history - which drew people from around the world to homestead and cut out a living on the vast forested lands and harsh prairie - that makes us different from central Canada. The story of two founding nations doesn't quite resonate in Alberta. When General James Wolfe defeated General Louis-Joseph, Marquis de Montcalm on the plains of Abraham in 1759, the "western lands" were being explored by the Hudson's Bay Company and Northwest Company who were fur trading with First Nations (Marshall 2006, Gismondi 2020).

Alberta has a very different founding story, one based principally on trade, not conquest. The first settler and farmer was Irishman Sam Livingston, who settled in a place that was to become Calgary in the 1870s after returning from the 1849 California Gold Rush (Jameson n.d.). Legendary black rancher, John Ware, arrived in 1882 when he was hired to help bring 3,000 head of cattle from the United States and discovered such a high demand for experienced cowboys that he decided to stay (Bonikowsky 2013). The first Chinese pioneers arrived in Alberta in 1885 (Dawson 1991). Ukrainians came to Alberta in the early 1890s, most of whom homesteaded northeast of Edmonton (Makuch n.d.). Sikh immigrants were already in the Crowsnest Pass as early as 1903, as pictures from the Frank Slide disaster attest to (McGarvey 2018). Lebanese Muslim pioneer, Ali Ahmed Abouchadi, arrived in Lac La Biche in 1906 and learned to speak Cree after becoming involved in the indigenous fur trade (Munir 2017).

We are not two founding nations in Alberta. We have always been a melting pot of cultures from around the world. That's who we are.

CHARACTER OF THE PROVINCE: OUR MOST PRECIOUS RESOURCE

It doesn't take long for someone to come to Alberta and become an Albertan and everything that that means.

As a result of our history, the character of Albertans is both entrepreneurial and communal. It's a perfect mix of both in fact. We cherish our entrepreneurs and wealth creators, but we also expect them to be community leaders and philanthropists. Perhaps better than anywhere else in the country we understand that the success of our government is dependent upon the success of private enterprise.

We understand that we need to have robust, growing, profitable businesses in order for them to generate the revenues to pay for the social programs we all care about. It's why Albertans can accept having the lowest corporate income tax rate in the country. It's because we know that when businesses are doing well they hire more workers and pay them higher wages. Those high-wage workers then pay personal income taxes and spend money on restaurants, events, local shops and travel, which creates a virtuous circle of even more wealth and job creation. Go to any hospital or university campus

and see who has sponsored a building or a wing. The titans of business – those who have benefited so much from the environment created by our government – have given back in spades.¹ They will continue to.

There have been times when we have allowed envy to creep in and cause harm, such as the disastrous 2008 royalty review which had to be largely reversed to restore the balance. But even that is a fundamentally Albertan characteristic. We make mistakes. But when we realize mistakes, we fix them.

As we look forward to life again after the pandemic comes to an end, we should have nothing but optimism for how the private sector will recover.

Alberta is entrepreneurial in the truest sense, as described by Austrian economist Joseph Schumpeter who coined the term creative destruction. We do not spend a lot of time thinking about how government should intervene to protect legacy industries. When businesses and sectors get demolished, Albertans get busy figuring out ways to create something new from the rubble. Our first energy boom was based on conventional oil. Our second energy boom was based on natural gas. Our third energy boom was centred on bitumen. Our fourth energy boom is going to be around hydrogen and carbon capture technologies. We keep moving forward. That is what we do.

Energy provides the foundation for our success and it is the perfect example of how Alberta entrepreneurs take a challenge and find a solution. Single pad drilling creating too much surface disruption? The industry develops horizontal multistage fracking. Oilsands mining creating a hazard with tailing ponds? The industry develops steam assisted gravity drainage. Excessive carbon dioxide creating an international furor? The industry develops carbon capture technology so it can be used for enhanced oil recovery or turned into useful products.

Even the efforts to stop Alberta companies from getting our energy to market shows this entrepreneurial mindset. Can't build pipelines? Transport it by rail. Tanker ban off the BC coast preventing us from exporting bitumen in liquid form? Bitcrude and Canapux develop a way to transport bitumen by rail in a semi-solid state so it can be shipped by container ship.

Do you see what I mean? There is no problem that is too big for our business leaders to solve. It's this character, this essential characteristic of Albertans, that is the most precious resource we have.

Whether it is forestry, or agribusiness, petrochemical refining, the new hydrogen hub, the film industry, nanotechnology, artificial intelligence, machine learning, or any other emerging industry, this character – we've got a problem, let's figure out how to solve it – spills over into every other sector.

¹

As examples see "Our History," Stollery Children's Foundation, <https://www.stollerykids.com/about-us/our-history.aspx> (accessed May 20, 2021) and "Haskayne donating millions to U of C business school", CBC News, May 28, 2002, <https://www.cbc.ca/news/canada/calgary/haskayne-donating-millions-to-u-of-c-business-school-1.336657> (accessed May 20, 2021).

It spills over into the non-profit sector too. Whenever Alberta faces a calamity – a flood in southern Alberta, a fire in Slave Lake or Fort McMurray, COVID-19 – the first to spring into action are the charities and non-profits. Whether it's armies of volunteers assembling to muck out people's homes, or teams of helpers donating clothing and essentials to support those who wait weeks to return home after a fire, or community leagues setting up grocery drop-offs for seniors shut in and too afraid to leave their homes during a pandemic, Albertans don't just sit back and wait for government to solve all their problems. When we see a need, we hop to it and solve it ourselves.

I have never been so optimistic about Alberta's future. It's like that fallow field that is just waiting to be seeded, a metaphor that has shaped the historic character of our people. We have been resting, and thinking, and quietly dreaming. When we are free to meet and start actively creating again, which will be soon, our economy will take off like a rocket ship.

REINVENTING GOVERNMENT

The only question we have to ask ourselves, is why don't our governments reflect this same Alberta character?

Alberta is the youngest, freshest, most innovative province in Canada and yet our government is not.

That may have been the most shocking revelation of the past 15 months in the response to COVID-19. To see the health care system – the entity we love so much we have poured nearly half of all government revenue into supporting it – was simply not up to the job of managing the crisis.

If the can-do attitude of the private and non-profit sectors were present in Alberta Health Services, the approach would have been entirely different. We would have been the first to contract with Entos and Providence Pharmaceuticals to create a made-in-Alberta vaccine so that we could have provided this essential remedy to the entire country. We would have been the first to do random controlled studies on promising therapeutics so that we have treatments available for those who get sick. We would have built a custom hospital – like we did during the days of tuberculosis – so we could have housed COVID patients in separate facilities and kept our regular hospitals operating at full capacity. We would have adopted a 2 week on/ 2 week off staffing model at our long-term care facilities – something we are so familiar with in Fort McMurray – to keep both our seniors and staff safe. We would have done a call-out to retired health professionals to lend a hand if we encountered staff shortages. We would have deployed rapid testing at all of our government-run congregate care settings – including prisons and group homes – to make sure viruses didn't get into these places to wreak havoc.

Instead, we had a bureaucracy who followed the crowd and lazily took the path of least resistance, locking down the entire economy and blaming Albertans for not doing enough to avoid getting sick.

Alberta's greatest challenge in the future is to create a public sector culture that matches the can-do attitude that exists everywhere else in Alberta outside of government.

Does Alberta have a spending problem or a revenue problem? This is a question from an old paradigm, not the can-do, energetic Alberta paradigm. The question should be, is the Alberta government innovative enough? Is it striving to find new ways to deliver services so it can live within the very generous means that Alberta's robust economy generates?

Are politicians doing enough to create a high-performance civil service? Undoubtedly the answer is no. Health spending increased from \$13.674 billion in 2008-09 to \$25.230 billion in 2020-21 (Government of Alberta 2021 p. 186). At the same time waiting lists, even before COVID-19, increased. Red alerts on Emergency Medical Services became more frequent. Stacked waits in hospital emergency rooms remained excessive.

Money is not the problem in health care. A culture of complacency is the problem in health care.

If we have learned anything from our energy business, innovation is transformative and its results can be realized extremely fast. Horizontal multistage fracking came into its own in 2009 and by 2014 there was so much production of shale oil and shale gas that the prices had collapsed for both. That is creative destruction in action.

If we use the old paradigm for solving the current budget problem I predict it will never be solved. Alberta will continue to trundle along accumulating debt until finance charges - which are already at \$2.764 billion - start eating into our ability to provide services (Government of Alberta 2021 p. 186). At some point, we will hit a debt wall and be forced to make deep and painful cuts.

The harsh reality is this. Not only does the province pay more per capita for government services than the other large provinces, it also has the lowest tax profile, largely because it doesn't charge a sales tax. For decades Alberta was able to continue the charade, offering year-over-year increases to appease and placate public sector unions, while reducing taxes to win over conservative-minded voters. What people forget is that former Premier Ralph Klein didn't cut taxes until he had the budget delivering healthy surpluses, and had made significant headway in setting aside enough money to pay off the debt.

The shocking tale of the Stelmach and Redford eras was how they both amped up spending on capital and operating expenses and allowed us all to live off windfall resource revenues to make up the difference. When energy prices collapsed at the end of 2014 the Alberta government plunged into deficits from which we've never recovered. The surplus in 2014-15 budget year was \$1.115 billion. The following year the deficit was \$6.442 billion and has never been lower in the seven years since. We've gone from net assets of \$55.251 billion in 2014-15 to an expected net liability of \$26.987 billion by the end of this budget year (Government of Alberta 2021 p. 186).

At this rate, revenues will never catch up to spending.

The apparent strategy appears to be, once again, to wait for the boom in resource revenues to bail us out. We may get lucky on this, but surely we must ask our government why it can't do better.

Whenever we have this regular budget calamity, commentators always bemoan the lack of diversification in the Alberta economy. But that's not really the problem. The problem is not a lack of diversification in industry, the problem is a lack of diversification in the provincial government's source of revenues, and a lack of innovation in the public service as a whole.

It's very telling when you look at the year-over-year changes in revenue in the year following the 2014 energy price crash (Government of Alberta 2021 p. 186).

Personal income tax revenues actually went up 2.8 per cent.

Other tax revenue went up 12.4 per cent.

Premiums fees and licences went up 0.2 per cent.

In fact, these three revenue sources have held remarkably steady over the last number of years, especially when compared to the volatility in resource revenue in the same year-over-year period.

Resource revenue went down 69 per cent in 2015-16.

Corporate income tax revenue went down 28 per cent.

The real problem with the provincial budget is that Alberta has built its operational spending for the vital services everyone needs – health, education, post secondary, social services – on volatile and unstable sources of funding. When revenues go down these areas are impossible to cut, not only because there is a strong public sector workforce that resists change, but because the public has no appetite to see these areas cut either.

This is the fundamental conundrum of Alberta. We want gold-plated services and we don't want to pay more taxes for them. Politicians are to blame for maintaining the fiction that this was sustainable. Anyone who proposes an alternative to raise taxes – the sales tax is the most obvious source of long-term revenue the province could adopt to solve this structural shortfall – it is instantly shot down by politicians fearing they won't be re-elected.

The other structural problem the government created in its revenues was a personal income tax with a very large – the largest in the country – basic personal exemption (Government of Alberta 2021 p. 160). Initially I supported the move, because it took the lowest income taxpayers off the tax rolls and allowed for families to get a large portion of their income shielded from tax to help pay for basics. The problem this has now created is that people think someone else should pay for the social services they need. That "someone else" is assumed to be the wealth and job creators of the province. But if you tax the wealthy too much, their capital is mobile. It can move to Panama and the government will get less than it has now. If you tax corporations too much, they don't

have the means to create new jobs that generate new personal income taxes, which has proven to be a more stable long-term source of revenue.

So, we find ourselves at an impasse where people want their government to continue to increase spending, but taxpayers want their own taxes to go down and everyone hopes resource revenues materialize to pay for it all. It is absurd and dangerous.

Here is the rub. Alberta's expenses are now at roughly \$55 billion. Debt servicing costs have climbed to \$3 billion, for a total of \$58 billion. Meanwhile, revenues are only reliably expected to generate \$46 billion. That means there is a structural shortfall of \$12 billion.

How big is \$12 billion? It is more than Alberta collects in personal income taxes in a year. It's nearly the entire amount we spend on education and post-secondary combined. It is more than we've received in resource revenues in any given year going back to 2008/09.

Do you see the problem? We cannot balance the budget on resource revenues alone. We cannot balance the budget on tax increases alone. We cannot balance the budget on spending cuts alone. We have to do all three.

THE PATH FORWARD

So, let's deal with this in three parts.

MANAGING RESOURCE REVENUES

First, we have to fundamentally change the way we manage our resource revenues.

The time to permanently wean Albertans off their energy royalty dependence is now, while resource revenues are at the lowest they've been in more than a decade. The 2020-21 forecast for resource revenues is \$1.978 billion. It's time to bite the bullet and say that this is the most resource revenue we will ever spend on operational needs again.

Then we must dust off the old idea that was much discussed and never implemented from the early 2000s when the government passed the Fiscal Responsibility Act and created the Sustainability Fund. The idea behind it at the time was to set a hard cap on how much resource revenue could be used for current yearly operational spending and sock away the rest for savings and capital investment (Morton 2018).

The first step in clearing the \$12 billion structural shortfall is to generate \$4 billion or more in new investment income.

Let's use historical data to get an idea of how powerful the rules-based budgeting approach outlined above could be. In 2008-09 - another calamity year with the financial market meltdown - resource revenues were \$11.915 billion (Government of Alberta 2021 p. 186). The new budgeting model would have set aside a maximum of \$2 billion of resource revenues for operational spending, with the balance being split evenly between capital investment and long-term savings.

As indicated in the Table below, had this approach been taken in 2008-09 and carried on, and the policy of increasing the fund in line with inflation continued, long-term savings would have grown to \$65.608 billion by 2024 (the currently projected Heritage Savings Trust Fund balance for 2024 is \$22.389 billion). Instead of generating a currently projected investment income of \$1.343 billion in 2024, this level of savings would have generated \$3.937 billion in that year. If government chose to save a higher amount, for instance 75 per cent of royalty revenues in excess of the \$2 billion going to operations expenses, annual investment income would have grown to \$5.233 by 2024 from a Heritage Savings Trust fund of more than \$87 billion. Compound interest is deadly when you are in debt and it is working against you. Compound interest is a miracle when you have savings and it is working in your favour. (See calculations in Tables below).

If we adopted this approach today and future resource revenues were similar to the average over the 2009 to 2021 period, within 10 years we would have a stable, long-term, growing source of revenue that could close one-third or more of the \$12 billion structural gap.

Scenarios for Savings																
Status Quo	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
(Millions)																
Royalties	\$11,915	\$6,768	\$8,428	\$11,636	\$7,779	\$9,578	\$8,948	\$2,789	\$3,097	\$4,980	\$5,429	\$5,937	\$1,978	\$2,856	\$4,718	\$5,869
Heritage Fund Actual	\$16,900	\$17,077	\$17,500	\$17,936	\$18,176	\$18,562	\$18,860	\$19,262	\$19,836	\$20,306	\$20,700	\$20,670	\$20,950	\$21,415	\$21,898	\$22,389
Inflation Proofing (Actual %)		1.05%	2.48%	2.49%	1.34%	2.12%	1.61%	2.13%	2.98%	2.37%	1.94%	-0.14%	1.35%	2.22%	2.26%	2.24%
Net Investment Income Actual (Total)	-\$1,858	\$3,541	\$2,486	\$2,168	\$2,595	\$3,423	\$3,113	\$2,544	\$3,698	\$3,126	\$2,349	\$2,828	\$2,390	\$2,205	\$2,325	\$2,478
Heritage Fund Return (Actual \$)	-\$2,501	\$2,076	\$1,152	\$898	\$1,465	\$2,154	\$1,825	\$1,388	\$2,467	\$1,972	\$1,071	\$1,471	\$1,257	\$1,285	\$1,314	\$1,343
Net Return on Heritage Fund (Actual %)	-10.99%	12.16%	6.58%	5.01%	8.06%	11.60%	9.68%	7.21%	12.44%	9.71%	5.17%	7.12%	6.00%	6.00%	6.00%	6.00%
Source: Government of Alberta Fiscal Plans	p 58	p 57	p 60	p 28	p 27	p 27	p 24	p 35	p 53	p 53	p 110	p 86	p 86	p 86	p 86	p 86

If the Policy of Saving 50 per cent of royalty revenue above \$2 billion had been implemented																
Royalties	\$11,915	\$6,768	\$8,428	\$11,636	\$7,779	\$9,578	\$8,948	\$2,789	\$3,097	\$4,980	\$5,429	\$5,937	\$1,978	\$2,856	\$4,718	\$5,869
(Less) Cap on Operating \$2B	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Remainder for Split (50/50)	\$9,915	\$4,768	\$6,428	\$9,636	\$5,779	\$7,578	\$6,948	\$789	\$1,097	\$2,980	\$3,429	\$3,937	-\$22	\$856	\$2,718	\$3,869
Available for Capital	\$4,958	\$2,384	\$3,214	\$4,818	\$2,890	\$3,789	\$3,474	\$395	\$549	\$1,490	\$1,715	\$1,969	-\$11	\$428	\$1,359	\$1,935
Available for Long-Term Savings	\$4,958	\$2,384	\$3,214	\$4,818	\$2,890	\$3,789	\$3,474	\$395	\$549	\$1,490	\$1,715	\$1,969	-\$11	\$428	\$1,359	\$1,935
Heritage Fund Actual	\$16,900	\$17,077	\$17,500	\$17,936	\$18,176	\$18,562	\$18,860	\$19,262	\$19,836	\$20,306	\$20,700	\$20,670	\$20,950	\$21,415	\$21,898	\$22,389
Inflation Proofing		1.05%	2.48%	2.49%	1.34%	2.12%	1.61%	2.13%	2.98%	2.37%	1.94%	-0.14%	1.35%	2.22%	2.26%	2.24%
Starting Balance	\$16,900	\$21,858	\$24,495	\$28,396	\$34,041	\$37,425	\$42,089	\$46,295	\$47,684	\$49,670	\$52,372	\$55,136	\$57,022	\$57,783	\$59,503	\$62,235
Add Additional Long-Term Savings	\$4,958	\$2,384	\$3,214	\$4,818	\$2,890	\$3,789	\$3,474	\$395	\$549	\$1,490	\$1,715	\$1,969	-\$11	\$428	\$1,359	\$1,935
Subtotal		\$24,242	\$27,709	\$33,214	\$36,931	\$41,214	\$45,563	\$46,689	\$48,233	\$51,160	\$54,087	\$57,105	\$57,011	\$58,211	\$60,862	\$64,170
Inflation Proofing		1.05%	2.48%	2.49%	1.34%	2.12%	1.61%	2.13%	2.98%	2.37%	1.94%	-0.14%	1.35%	2.22%	2.26%	2.24%
Total at Year End	\$21,858	\$24,495	\$28,396	\$34,041	\$37,425	\$42,089	\$46,295	\$47,684	\$49,670	\$52,372	\$55,136	\$57,022	\$57,783	\$59,503	\$62,235	\$65,608
Return on Investment (as above)	-10.99%	12.16%	6.58%	5.01%	8.06%	11.60%	9.68%	7.21%	12.44%	9.71%	5.17%	7.12%	6.00%	6.00%	6.00%	6.00%
Heritage Fund Return (Original)	-\$2,501	\$2,076	\$1,152	\$898	\$1,465	\$2,154	\$1,825	\$1,388	\$2,467	\$1,972	\$1,071	\$1,471	\$1,257	\$1,285	\$1,314	\$1,343
New Heritage Fund Return		\$2,978	\$1,869	\$1,704	\$3,016	\$4,884	\$4,480	\$3,436	\$6,177	\$5,086	\$2,853	\$4,058	\$3,467	\$3,570	\$3,734	\$3,937
Increase in Investment Income		\$902	\$717	\$806	\$1,551	\$2,730	\$2,655	\$2,048	\$3,710	\$3,114	\$1,782	\$2,587	\$2,210	\$2,285	\$2,420	\$2,593
Total Additional Revenue Available for Spending from Investment Income (sum of extra investment income)																\$32,112
Total Capital Investment to Realize Investment Income (sum of royalty revenue placed into fund)																\$35,353
Total Increase in Value of Heritage Fund																\$43,219

If the Policy of Saving 75 per cent of royalty revenue above \$2 billion had been implemented																
Royalties	\$11,915	\$6,768	\$8,428	\$11,636	\$7,779	\$9,578	\$8,948	\$2,789	\$3,097	\$4,980	\$5,429	\$5,937	\$1,978	\$2,856	\$4,718	\$5,869
(Less) Cap on Operating \$2B	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Remainder for Split (25/75)	\$9,915	\$4,768	\$6,428	\$9,636	\$5,779	\$7,578	\$6,948	\$789	\$1,097	\$2,980	\$3,429	\$3,937	-\$22	\$856	\$2,718	\$3,869
Available for Capital	\$2,479	\$1,192	\$1,607	\$2,409	\$1,445	\$1,895	\$1,737	\$197	\$274	\$745	\$857	\$984	-\$6	\$214	\$680	\$967
Available for Long-Term Savings	\$7,436	\$3,576	\$4,821	\$7,227	\$4,334	\$5,684	\$5,211	\$592	\$823	\$2,235	\$2,572	\$2,953	-\$17	\$642	\$2,039	\$2,902
Heritage Fund Actual	\$0	\$2,978	\$1,869	\$1,704	\$3,016	\$4,884	\$4,480	\$3,436	\$6,177	\$5,086	\$2,853	\$4,058	\$3,467	\$3,570	\$3,734	\$3,937
Inflation Proofing		1.05%	2.48%	2.49%	1.34%	2.12%	1.61%	2.13%	2.98%	2.37%	1.94%	-0.14%	1.35%	2.22%	2.26%	2.24%
Starting Balance	\$16,900	\$24,336	\$28,205	\$33,844	\$42,094	\$47,049	\$53,853	\$60,012	\$61,896	\$64,587	\$68,406	\$72,354	\$75,198	\$76,200	\$78,548	\$82,404
Add Additional Long-Term Savings	\$7,436	\$3,576	\$4,821	\$7,227	\$4,334	\$5,684	\$5,211	\$592	\$823	\$2,235	\$2,572	\$2,953	-\$17	\$642	\$2,039	\$2,902
Subtotal		\$27,912	\$33,026	\$41,071	\$46,428	\$52,733	\$59,064	\$60,604	\$62,718	\$66,822	\$70,977	\$75,307	\$75,182	\$76,842	\$80,586	\$85,305
Inflation Proofing		1.05%	2.48%	2.49%	1.34%	2.12%	1.61%	2.13%	2.98%	2.37%	1.94%	-0.14%	1.35%	2.22%	2.26%	2.24%
Total at Year End	\$24,336	\$28,205	\$33,844	\$42,094	\$47,049	\$53,853	\$60,012	\$61,896	\$64,587	\$68,406	\$72,354	\$75,198	\$76,200	\$78,548	\$82,404	\$87,218
Return on Investment (as above)	-10.99%	12.16%	6.58%	5.01%	8.06%	11.60%	9.68%	7.21%	12.44%	9.71%	5.17%	7.12%	6.00%	6.00%	6.00%	6.00%
Heritage Fund Return (Original)	-\$2,501	\$2,076	\$1,152	\$898	\$1,465	\$2,154	\$1,825	\$1,388	\$2,467	\$1,972	\$1,071	\$1,471	\$1,257	\$1,285	\$1,314	\$1,343
New Heritage Fund Return		\$3,429	\$2,228	\$2,108	\$3,792	\$6,249	\$5,807	\$4,460	\$8,033	\$6,643	\$3,744	\$5,352	\$4,572	\$4,713	\$4,944	\$5,233
Increase in Investment Income		\$1,353	\$1,076	\$1,210	\$2,327	\$4,095	\$3,982	\$3,072	\$5,566	\$4,671	\$2,673	\$3,881	\$3,315	\$3,428	\$3,630	\$3,890
Total Additional Revenue Available for Spending from Investment Income (sum of extra investment income)																\$48,168
Total Capital Investment to Realize Investment Income (sum of royalty revenue placed into fund)																\$53,029
Total Increase in Value of Heritage Fund																\$64,829

USER FEES

The next step in closing the gap is to generate \$4 billion from new user fees.

We can no longer afford universal social programs that are 100 per cent paid by taxpayers. That is the simple truth. Taxpayers do not want to throw more money at an inefficient system. Public servants don't want to reform the system from within. The only option is to allow people to use more of their own money to pay their own way and use the power of innovation to deliver better services at a lower cost.

The fundamental rethink that needs to happen in health care is to create a patient-centred system. It has to be more than a slogan. It has to have buy-in on the part of practitioners and patients. It has to be built on a model that is already working. It has to shift the burden of payment away from taxpayers and toward private individuals, their employers and their insurance companies.

What the government needs to do is create matching Health Spending Accounts for all Albertans. The government should pledge to match up to \$375 per person and challenge individuals and employers to do the same. The benefit of a Health Spending Account is that it allows people the means to pay for services that are uncovered and largely preventative – massage therapy, physiotherapy, dieticians, prescriptions and so on. By taking responsibility for their health and giving people the means to do so, it should translate into less pressure on the hospital system and better chronic care management which will bring costs down.

But once people get used to the concept of paying out of pocket for more things themselves then we can change the conversation on health care. Instead of asking, what services will the government delist?, we would instead be asking what services are paid for directly by government, and what services are paid for out of your Health Spending Account?

My view is that the entire budget for general practitioners should be paid for from Health Spending Accounts. If the government funded the account at \$375 a year, that's the equivalent of 10 trips to a GP, so there can be no argument that this would compromise access on the basis of ability to pay.

What it would do is allow for people to make their own choices about the type of medical practitioner they want to see in a year. Maybe I would prefer to see a dietician to give me a nutrition tune-up. Maybe I need to see a psychologist to deal with the mental stress of lockdown for the last year. Perhaps the pain in my shoulder can be better treated by a physiotherapist. For parents with healthy kids but crooked teeth, it could even be used to help defray the cost of braces. Or help cover the costs to fill a cavity.

A Health Spending Account would actually create a system with more comprehensive coverage than it currently has now.

But we could take it one step further.

I think it's time to redefine universality. Universality must mean that no one is denied care when they need it and no one should face bankruptcy because of medical bills. Full stop.

It does not mean that we must maintain a system of arbitrary rules for what you must pay for out of your own pocket and what government must pay for exclusively on your behalf.

We should begin to talk about creating a publicly administered health insurance system based on principles of proper insurance. In a proper insurance program, there is usually a deductible or co-payment on services until it reaches a certain maximum when catastrophic coverage kicks in.

If we establish the principle of Health Spending Accounts, then we can also establish co-payments. It doesn't need to be onerous, and it could be on a sliding scale. If you earn less than \$75,000 a year, there would be no deductible. If you earn \$75,000 to \$150,000 a year, there would be a \$500 deductible. If you earn more than \$150,000 a year, there would be a \$1000 deductible.

I don't believe Albertans are willing to pay one penny more for an underperforming health system and watch their dollars evaporate without any improvement in performance. I'm willing to bet most Albertans would be willing to pay up to \$1000 if it would reduce waiting times on vital treatments for themselves or a family member.

I can guarantee you as well that if the government creates this structure, business and non-profits will step up. Employers will make matching contributions to Health Spending Accounts. Non-profits will be established to make charitable contributions to the Health Spending Accounts of low-income earners so they can get a broader range of health services. Because that is the character of Albertans. We take care of each other. It's what we do.

REENGINEERING THE DELIVERY OF SERVICES

The final step in closing the \$12 billion structural gap is to generate \$4 billion in spending efficiencies by reengineering how programs are delivered.

You will note, before I even talked about how to reduce the cost of health care and find efficiencies, I identified two ways to generate new revenue that will address at least \$8 billion of Alberta's structural deficit. In other words, I'm proposing that two-thirds of the problem be addressed on the revenue side.

I know Albertans will do their part to keep on generating revenue for government. But the public service needs to be put on notice. Their underperformance cannot continue. It must stop now.

On a base of \$55 billion in spending, finding \$4 billion in savings amounts to a 7.2 per cent cut, to take spending down to \$51 billion. There is no painless way to do this, unfortunately. Bureaucracies have proven themselves to be terrible at finding efficiencies. They are geared to grow. The only way to make substantial and significant changes in the way programs are delivered is to allow contracting out, competition and choice.

The model for K-12 education is the model the government needs to embrace for health care. There are four ways to deliver education in Alberta. Public schools are 100 per cent publicly funded and publicly delivered. Charter schools are publicly funded but privately delivered and are forbidden from charging tuition fees. Private schools can charge tuition, but only receive up to 70 per cent of the per student basic grant (about \$5500 per student). Home schooling is the most cost-effective of all for the government (about \$850 per student).

Where this model has the opportunity to make a major difference is health care. There should be similar options. Public hospitals that are publicly funded and publicly delivered. Charter hospitals that are publicly funded and privately delivered and cannot charge extra fees. Private hospitals that can receive contracts for publicly paid services as well as serve paid customers (foreign clients on a pay-for-service basis to remain in compliance with the Canada Health Act). Home-based health care such as doctor house calls, home care and midwife services.

Evidence from Saskatchewan suggests that privately run surgical centres can reduce waiting times substantially (MacKinnon 2016). The beauty of an alternative delivery model is that it also offers choice for front-line workers. It must be horribly demoralizing to only be able to work for a single employer. If you don't like your work, the only option is to leave the profession. Having multiple service providers allows for the creation of multiple creative environments that will be better for patients and staff alike.

Charter hospitals can create a world of new opportunity. They can specialize in the delivery of a particular service whether hernias, like the prestigious Shouldice Clinic, or knees and hips, like Health Resource Centre did before the government shut them down, or cataracts, like the Mitchell Eye Clinics.

We could have specialized birthing centres, so new moms could have a custom environment to offer the most pleasant experience possible to welcome the new member of their family. Maybe moms would even be able to opt for longer stays to get used to the new life they are going to have with their baby, the way they used to at the Grace Hospital.

Maybe we would develop a Mayo Clinic north, which would specialize in diagnostics. Rather than waiting months between appointments to see a specialist, you could make an appointment and see all the specialists you need to see on a given day.

Maybe there will be a lab specializing in mapping your genome, so you can take proactive measures to guard against the diseases you are most likely to develop.

Maybe a specialty clinic will develop for rare diseases, and have such a large number of patients from around the world that they can procure specialty drugs from pharmaceutical companies at a reasonable price.

The point is we don't know what we don't know. That is the beauty of entrepreneurship. Someone will conceive of a brilliant way to do things differently that will not only deliver better patient care but do it in a way that reduces the cost for all of us.

IN CONCLUSION

Alberta's biggest danger in the next 10 years is that the government will fritter away yet another boom by doing things the same way it always has.

Albertans can forgive mistakes as long as they are corrected. Albertans cannot forgive the mania of making the same mistake over, and over, and over, and over again.

With the way the world of energy is changing, this may be the last energy revenue windfall the Alberta Government receives. The challenge is to make the most of it.

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CHAPTER 3

**THE STATE OF THE
ALBERTA ECONOMY
AND THE PATH
FORWARD**

Todd Hirsch

INTRODUCTION

There has been no lack of commentary on the weak state of Alberta's economy. The double hit of low oil prices combined with the impact of the global pandemic has knocked the wind out of many businesses and sent unemployment soaring. Making matters worse, the province was already hobbling into 2020, having sustained a brutal recession in 2015-16, and only a modest recovery leading up to the start of the pandemic.

It's not unfamiliar territory for Alberta. Since the early 1970s, the province has been on a continual boom-and-bust cycle. Recessions are not new. Still, the last seven years have been particularly punishing.

There are now greater glimmers of hope on the horizon. As Alberta enters mid-2021, the vaccination process is picking up momentum. That is increasing optimism the COVID-19 pandemic will soon be in the past and the global economy will gradually reopen. Yet while the virus will ebb and the economy will eventually reopen, there has been a structural shift that has altered Alberta's economy permanently. Simply put, there will be no "getting back to normal" any time soon.

For so many years the energy sector was the growth engine of Alberta, pulling in foreign capital, creating high paying jobs and spurring construction and engineering spending. Now, the energy sector is taking on a new role: it's no longer a growth engine, but a backbone. The province's hydrocarbon production will remain significant for decades to come, but Alberta can no longer rely on it alone to drive growth.

This essay will explore three themes:

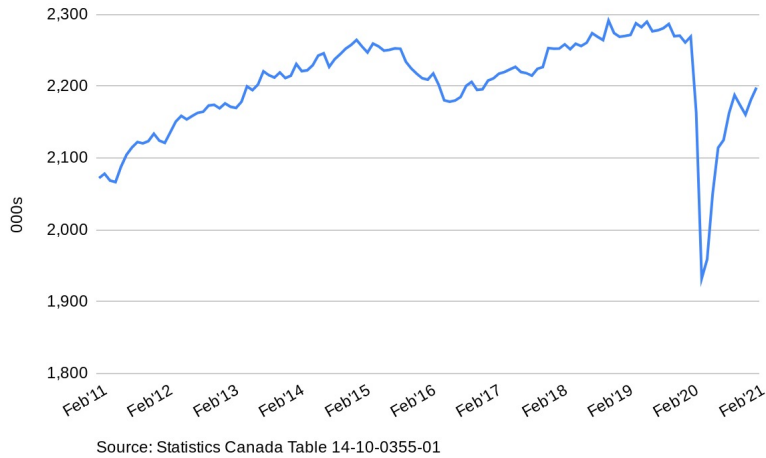
1. How have employment trends in Alberta changed over the last two recessions, and what do they suggest about structural changes in the energy sector?
2. What do these job trends reveal about the public sector, traditional industries and emerging industries?
3. What is the path forward for Alberta, and what changes might need to be made to ensure a strong, stable and prosperous economy?

1. A TALE OF TWO RECESSIONS: JOB TRENDS IN ENERGY AND NON-ENERGY SECTORS

Figure 1 shows total employment in Alberta over the last ten years, which captures both the oil-price induced downturn of 2014 and the impact of the global COVID-19 pandemic. The recessions of both 2015-16 and 2020 can be seen clearly in the employment data, although the two patterns stand in stark contrast.

In the first recession, between January 2015 and June 2016, the labour market shed nearly 90,000 jobs, a drop of 3.4 per cent over a period of 17 months. Total employment did not return to pre-downturn levels until August of 2018. While quite severe, the drop and recovery in total employment followed a typical pattern for Alberta during an oil-price induced recession.

Figure 1: Total Employment in Alberta (seasonally adjusted)



However, what happened in early 2020 was unprecedented. With the onset of the pandemic, total employment fell by an astounding 13.7 per cent between February and May 2020. And while it recovered approximately three-quarters of its losses in the following few months, total employment remains well below (-3.1 per cent) its pre-pandemic levels.

Yet the job market in Alberta’s oil and gas industry shows a very different pattern of recession and recovery over the same period of time. In Figure 2 we see the energy recession starting much sooner than in the overall economy. Employment started to fall almost immediately with the dip in oil prices, which had reached a peak in June 2014. Employment in the resource sector dropped 30 per cent between July 2014 and July 2016.

Figure 2: Employment in Resource Extraction* in Alberta (seasonally adjusted)



After recovering about half of its losses in the following two years, employment in oil and gas dropped again after the summer of 2018 — but this time oil prices were not the cause. The employment losses in 2018 and 2019 were more because of companies improving their efficiencies through consolidation within the sector, the increased use of automation and technology, and other cost reduction.

The COVID pandemic also reduced employment in Alberta’s energy sector, but it seems that the drop in oil prices — not the pandemic itself — was the chief cause (although the two were closely related). By February 2021, both global oil prices and employment in Alberta’s energy sector managed to recover to their pre-COVID levels.

Figure 3 shows total employment excluding resource extraction. Here the difference between the 2015-16 recession and the 2020 recession stands in even starker contrast. While employment excluding resources did drop in the 2015-16 recession (-0.7 per cent), it recovered within two years — something employment in oil and gas never came close to achieving. On the other hand, employment excluding resources plunged much deeper in the 2020 recession, and unlike resource employment, it remains significantly below (-3.5 per cent) pre-pandemic levels.

Figure 3: Total Employment excl. Resources in Alberta (seasonally adjusted)



Source: Statistics Canada Table 14-10-0355-01

All of this points to a clear shift in employment in Alberta’s energy sector, suggesting a unique structural change that has occurred. The energy sector was able to recover from the global pandemic relatively quickly, but total employment remains far below 2014 levels. What’s more, it seems unlikely that employment in oil and gas will ever fully recover. Efficiency gains and cost containment, forced by the 2014 price collapse, are the reasons. As well, it is possible that policy changes around carbon constraints and expectations of further restrictions in the future are also contributing to lower employment levels.

To sum up, employment data over the last ten years show two distinct recessions in Alberta. The first induced by an oil price collapse, and the second by a global pandemic

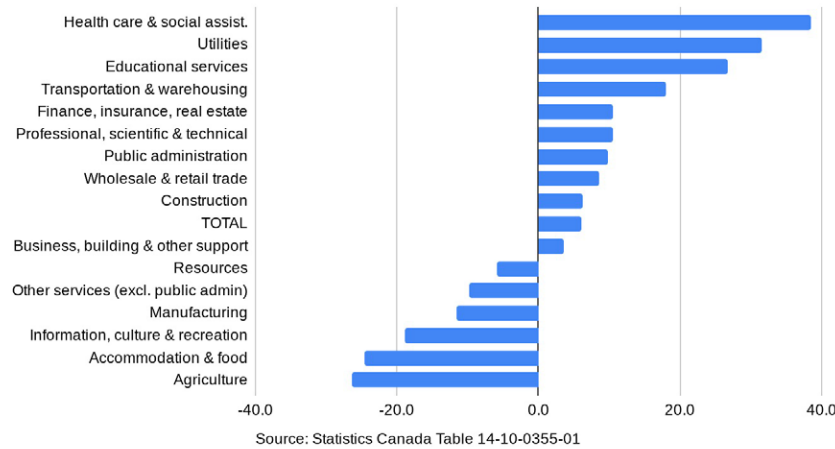
(also involving an oil price collapse). While employment in sectors outside oil and gas recovered relatively quickly from the first, employment in oil and gas has never recovered. The COVID recession had the opposite effect — oil and gas rebounded quickly, but other sectors have not.

The structural change in Alberta’s oil and gas industry appears to be permanent. More automation, better technology and greater operating efficiency have allowed the industry to operate profitably with far fewer employees. That may be good news for shareholders of companies, but it presents a challenge for the provincial economy as some 50,000 high-paying energy sector jobs are permanently gone.

2. JOB TRENDS IN THE PUBLIC, TRADITIONAL AND EMERGING SECTORS

What other sectors have taken up the baton of growth in Alberta’s job market? Figure 4 shows changes in employment by sector in the province for the last ten years, encompassing both recessions. The patterns are interesting and at times contradictory to commonly accepted “truths” about Alberta’s economy.

Figure 4: Percent Change in employment in Alberta, Feb’11-Feb’-21



Employment growth has been greatest in three sectors: health care and social assistance (+38 per cent), utilities (+32 per cent) and educational services (+27 per cent).

Over the same time, employment fell significantly in agriculture (-26 per cent), accommodation and food (-25 per cent) and information, culture and recreation (-19 per cent). Admittedly, much of the drop in employment in some of these sectors (especially accommodation and food) is due to COVID; they are still likely to recover in the post-COVID years.

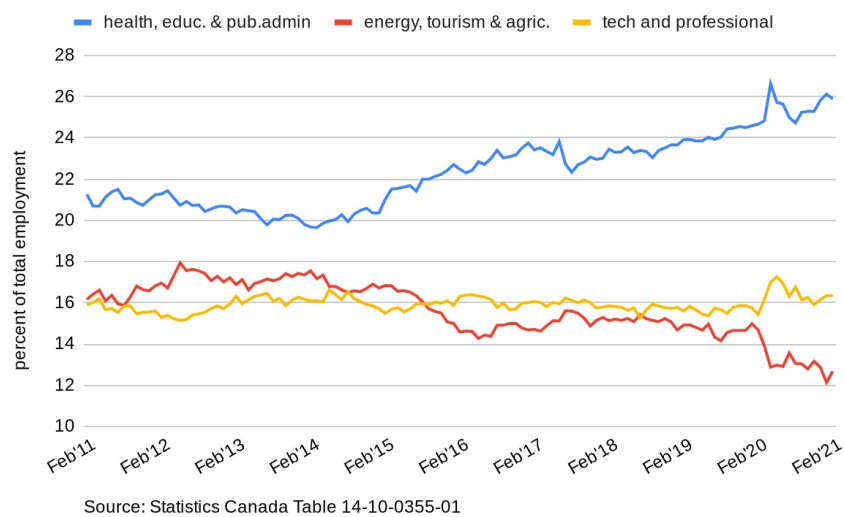
There has been little or no growth in other key sectors of the job market, including business services and construction.

Grouping some of these job categories together, we can identify several interesting trends in the province. A few of these trends contradict some of the conventional thinking about Alberta, especially with respect to certain industries that dominate the stereotypes.

Figure 5 illustrates the trend in these three broad employment categories.

- BLUE LINE: public sector oriented jobs (health care and social assistance, education services and public administration)
- RED LINE: jobs in Alberta’s traditional and stereotypical sectors (resource extraction, accommodation and food services, and agriculture)
- YELLOW LINE: jobs in what are thought to be new and emerging industries in the province, like technology and life sciences¹

Figure 5: Jobs in Key Sectors as % of Total Jobs in Alberta



A few observations stand out immediately.

First, an undeniable pattern emerges over the last ten years: jobs in healthcare, education and public administration – largely related to government spending – are becoming more dominant. They grew from 21 to 26 per cent of all jobs over the last ten years.

Second, jobs in sectors that traditionally define the images of Alberta – energy, tourism and farming – are becoming less dominant. They fell from 16 to 13 per cent of total jobs. This defies the misconception that everyone in Alberta is employed in oil and gas or farming.

Third, there is little evidence that jobs in technology, life sciences or other emerging industries have yet materialized. They moved only from 15.9 per cent to 16.3 per cent.

¹ It is difficult to isolate jobs in the “tech sector” since that is not a category in employment data as defined by Statistics Canada. But three broad job categories can be used to capture emerging industries: professional, scientific and technical services; business, building and other support services; and finance, insurance, real estate, rental and leasing. While not a perfect fit, these will serve as a proxy to measure activity in the technology, life sciences and financial services.

However, it is encouraging that almost all of the growth that has occurred was in the last year or so. That suggests these sectors are indeed starting to grow and may indeed continue to rise in the future.

A fourth observation is that while the *share of employment* in traditional sectors may have fallen, the contributions these sectors make to the overall economy have not necessarily fallen. As described earlier, the improvements and efficiency gains made in the energy sector have allowed it to be more productive with fewer workers. The same is true of agriculture, where total output has expanded while employment has shrunk. They should not be considered “sunset” industries simply because they employ fewer people. Rather, they will remain core components of the province’s export industries without which Alberta’s economic base and future prosperity would shrink.

Nonetheless, the loss of employment in Alberta’s traditional energy industry is a concern. It raises the obvious question: what will replace oil and gas as a driver of economic growth and employment? Several industries offer great potential for this role, including the technology and digital sectors, agriculture and agri-foods, renewable energy and clean energy technologies. But even the most optimistic booster of these sectors would not suggest they alone can replace the jobs lost in oil and gas. And many of the skills required in these emerging industries are not directly transferable from the energy sector.

If Alberta is to avoid slipping into long-term economic decline, it will require growth from these and many other new industries. How we get there is the basis of the next and final section of this chapter.

3. THE PATH FORWARD

Given the evidence of a decade’s worth of jobs data, it is clear that Alberta is at a turning point. Employment opportunities in traditional industries are in decline. Jobs in the public sector have risen, but given the challenges of provincial government finances, this cannot continue to be the sole growth engine. And while there is a lot of hope for emerging industries in the technology and digital space, jobs in these sectors have yet to truly “emerge.”

What can Alberta do?

Countless policy recommendations and prescriptions for boosting economic activity have been put forward. Many of these recommendations can be described as “pro-growth” and have focussed primarily on two themes: 1) boost overall productivity, and 2) increase competitiveness. Cutting business taxes, incentivizing research and development, reducing regulatory burden (colloquially called “cutting red tape”), lowering operating costs, building transportation infrastructure, offering tax incentives and reducing labour expenses are the most common methods prescribed by economists and business advocacy groups alike.

While they may be effective at drawing in business and capital, one must recognize that these kinds of recommendations could also have damaging unintended effects in other areas, leading to suboptimal outcomes from a societal perspective. For example, cutting red tape for business could mean skipping important steps and processes

around environmental protection. Lowering business taxes can create a revenue vacuum that must be filled with higher taxes elsewhere, cuts to programs or higher public debt. Lowering labour expenses by, for example, relaxing labour health and safety codes could result in higher worker injuries on the job.

Many recommendations targeting overall efficiency and productivity are valid, particularly since Canada's lagging rates of productivity growth have long been a concern of economists. These recommendations should be considered and implemented where appropriate. Yet taken in isolation, they are incomplete solutions to achieving a healthy, balanced and prosperous society in the long-run. In a complex system like a provincial economy, a holistic approach to growth and development must take into account all of the side effects that these policy recommendations might have.

Rather than repeating another list of pro-growth recommendations, it makes more sense to step back and look at the bigger picture in the long-run, and ask: What needs to happen in Alberta to secure a healthy and prosperous economy for all, where the well-being of each individual takes priority over simply growing the GDP? This, after all, should be the goal. It is not the size of the GDP that matters, but its quality as measured by rising income per capita and falling income inequality.

Offered here are four high-level values that should guide the practices of businesses, policies of governments and the priorities of citizens. Unlike simple policy remedies, these values are more philosophical in nature. They are principles and attitudes that must prevail if Alberta is to achieve its economic and social potential.

i. Prioritize education

Globally, Alberta's education system ranks quite highly in terms of quality and accessibility (although there are criticisms to be made about the global ranking process). Our K-12 system performs particularly well; still there are improvements to be made. A favourable ranking against global peers is no reason to rest on one's laurels, especially when there are suggestions that our ranking is slipping.

Where there are more pressing challenges and concerns is with two other equally important areas of education: early childhood care and education, and post-secondary education.

There is no lack of evidence supporting the connection between good early childhood education and positive outcomes later in life. According to UNESCO,

"Early childhood care and education (ECCE) is more than preparation for primary school. It aims at the holistic development of a child's social, emotional, cognitive and physical needs in order to build a solid and broad foundation for lifelong learning and wellbeing. ECCE has the possibility to nurture caring, capable and responsible future citizens."²

²

Marope, P.T.M., Kaga, Yoshie, 2015. "Investing against evidence: the global state of early childhood care and education" UNESCO website <https://en.unesco.org/themes/early-childhood-care-and-education>

Yet for all the evidence, Albertans (or Canadians) have never prioritized ECCE. At best, a growing dialogue is taking place around the need for a national daycare system. The emphasis has been on enabling women to enter or re-enter the workforce post-COVID. That alone is a laudable goal. But a step beyond simply offering daycare is *prioritizing early childhood education*. Embracing some notion of that would be a bold step in preparing today's children for the economy and society of the future.

At the other end of the education time-line is post secondary education (PSE). This, too, needs to gain a higher degree of priority by Albertans — governments, businesses and citizens. High quality higher education, coupled with accessibility and affordability for students, will produce the talented workforce of the future. Yet increasingly, access to PSE in Alberta is becoming more limited. Rising tuition fees, limited capacity in programs and a reduction in the number of programs available have pushed some potential students away. Increased funding for education at all levels would help, but given the province's tight fiscal constraints, this seems improbable. Blunt cuts to funding for education, on the other hand, will likely make matters worse.³

Finally, there should be a greater focus on skills training and development for workers of all ages. This can happen both through government programs and employer-sponsored training. Ensuring all workers are continuously upgrading their skills, especially in digital and technological literacy, is becoming increasingly important.

ii. Foster social inclusivity and diversity

Just as the connections between education and the economy have been well established, there is a growing recognition that social and racial diversity is also an economic imperative.⁴ Yet in Alberta — as in virtually all other places — racial discrimination, misogyny and xenophobic attitudes remain ingrained in our culture.

There is work for governments to do in this regard, to be sure. Both in terms of hiring practices within the bureaucracy and policies to combat racism, misogyny and xenophobia in the general public, governments at all levels must set the example. Strong condemnation of racist demonstrations must come swiftly and forcefully. Silence cannot be an option for governments.

Yet for all governments can and should do, there's probably more work to be done by individual citizens. It behooves each Albertan to examine what racism in its many forms looks like. Racism is not limited to hatred and violence against people of colour. Racism also takes the form of stereotyping, joking, excluding and marginalizing people of colour. The same goes for misogyny and xenophobia, which affects women, LGBTQ2S+, physically and mentally challenged people, Indigenous people and religious communities.

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It is beyond the scope of this chapter to discuss options for education reform. More funding is one starting point, but should not be seen as a panacea. Adopting best practices from K-12 education systems around the world, implementing a system of early childhood education, and considering more micro-credentials (vs. four-year programming) in post-secondary institutions are places to start.

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Treuhaft, Sara, and Justin Scoggins and Jennifer Tran. October 22, 2014. *"The Equity Solution: Racial Inclusion Is Key to Growing a Strong New Economy."* Policy Link, USC Program for Environmental and Regional Equity. <https://policylink.app.box.com/v/equity-brief>

Alberta businesses also have a role to play in battling racism, misogyny and xenophobia in the workplace. It must be more than a token approach or an afternoon of “sensitivity training.” It has to permeate the cultural DNA of the company.

While there are encouraging signs on all three fronts — governments, individuals and businesses — we have only started to scratch the surface of confronting our deeply entrenched biases and racist attitudes. It must become an ongoing effort.

Not only is it the morally right thing to do, weeding out discrimination is also the economically right thing to do. Businesses benefit from greater cultural, racial and gender diversity because it enriches the conversations and enlarges perspectives. Nothing kills innovation and creativity more quickly than ten people sitting around a board table, all with the same gender, colour, education and cultural background.

And as an added economic benefit, a more richly diverse and inclusive Alberta will more easily attract new-comers to the province. International migration, the source of an almost endless bounty of talent and creativity, will become increasingly important in the years ahead. If we foster a generous spirit of inclusivity — not just “tolerant” of diversity, but truly desirous of diversity — our reputation will act to draw the world’s best and brightest minds.

iii. Uphold our brand and reputation

In an increasingly globalized world — a trend that preceded the COVID pandemic, and will certainly return after it — being an attractive place to live, work and play is becoming more important than ever. Albertans pride themselves on the province’s affordable cost of living, great natural amenities, vibrant cities and safe communities. The Economist Intelligence Unit agrees, ranking Calgary fifth on the ranking of most livable cities in the world.⁵

But we cannot take this for granted. Albertans must continually be asking themselves “What is it about Alberta that would draw someone to live here?” This is particularly critical at the moment when the province is suffering high unemployment. While there is not much data available yet to corroborate it, the impression painted by anecdotal information is that young people are leaving the province in droves. It may or may not actually be happening, but the perception is that they are leaving.

What attracts and retains people to a region? Good jobs? Low taxes? Affordability? Lifestyle? It’s likely a combination of all of these things, but as the world becomes more globalized, attracting and retaining the most talented people will come down disproportionately to lifestyle — amenities like recreation, vibrant culture, liveable communities, great post-secondary institutions and cultural diversity. (The latter two are addressed in key values #1 and #2 above). This is especially true of young, bright, talented people in sectors like technology and digital media. They can live anywhere in the world they please. While job opportunities, income levels and costs of living are

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See The Economist Intelligence Unit website
https://www.eiu.com/public/topical_report.aspx?campaignid=liveability2019

significant factors, we cannot discount the attraction of a city that matches their own values and opportunities for self-fulfillment.

This is why reputation is so important. Arguably Alberta has a “branding” problem at the moment. Fairly or unfairly, the province has been depicted as nothing more than dirty, fossil-fuel spewing industries with socially-conservative minded people. This, of course, is far from the truth. But this is the stereotype that sometimes defines Alberta to people in the rest of Canada and abroad.

(Another way of looking at this is to suggest Alberta has attracted in-migration over several decades *because of* – not *in spite of* – its perceived socially conservative and libertarian values. Many Canadians find these characteristics to be positive. The extent to which this has been the case is an excellent area for further research.)

Addressing this “branding” challenge will take some effort, but the first thing Alberta needs to do is stop making it worse. The blame is certainly not limited to governments. Individual Albertans have also propagated these unseemly stereotypes (such as the infamous Greta Thunberg bumper stickers⁶). With these images and perceptions allowed to define the narrative, how can Alberta expect to attract and retain young, talented and globally-minded people? Why would they live in a place that is seemingly incongruous with their own values and priorities?

Again, the responsibility is shared among governments, businesses and individuals. They shouldn’t base their decisions solely on what others think, but they must always consider how their actions shape and define the province’s reputation. If Alberta allows itself to be painted in negative tones, it shouldn’t be surprised if it sees increasing numbers of young, educated people leave, and fewer global young people arrive. Loss of talent and people is something that not even the lowest taxes or most deregulated market can counter.

iv. Look positively toward the future

Nostalgia, it’s been said, is a cruel lover. It paints a beautiful image of a glorious past which is, almost certainly, a fantasy. Then it makes us long for its return – which of course can never come. Nostalgia is a trick of the mind, and it can become a trap from which escape is difficult.

Certainly for Alberta, a sense of nostalgia has crept into the conversation. Regularly you will hear people and politicians say, “We need to get our economy back on track!” The sentiment resonates with people. Many Albertans long for the 1970s, 1990s or early 2010s, when oil prices were lifting many (but not all) boats. Employment was improving, incomes rising, public debt retiring and consumers spending. Times were good for many.

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Globe and Mail, February 27, 2020. “Greta Thunberg sticker depicting sexual assault linked to Alberta oil company draws outrage” <https://www.theglobeandmail.com/canada/alberta/article-greta-thunberg-sticker-depicting-sexual-assault-linked-to-alberta-oil/>

Of course, the good times were not had by all — and this is what nostalgia causes one to forget. Low income people on fixed incomes faced spiralling rent increases. Businesses outside oil and gas competed (with futility) for labour. Government programs strained to keep pace with population increase. Residential prices skyrocketed, pushing property taxes higher on some fixed-income residents.

The nostalgia of the past was also rooted in a different reality. Pipeline opposition was almost non-existent and the oil patch never had to worry about market access. Although climate change and greenhouse gas emissions have been part of the public consciousness for decades, governments and citizens around the world were still rather passive about carbon emissions.

Today, the world has changed — and these changes are forcing Alberta to shake loose the nostalgic dreams of a by-gone day. No one doubts that oil will continue to be produced and sold for decades to come. But a growing consensus has formed that peak global oil demand will come sooner or later. That reality has shocked the province into grappling with this fact: the hydrocarbon industry is the backbone, but no longer the growth engine, of Alberta's economy.

Looking positively toward the future means we stop trying to “get back on track” — arguably, it was the track Alberta was in that was the problem. Without question, there are values and characteristics from our past that we need to foster: entrepreneurship, adaptability, community and innovation, to name a few. These are legacies of our industrial heritage, and should not be left in the past. But until Albertans can symbolically let go of nostalgia and stop trying to recreate the economy of the past, the province won't be able to move forward.

4. CONCLUSION

Alberta's labour market has changed over the past decade, signalling a fundamental shift in the economic composition of the province. In Parts 1 and 2 of this chapter, we see that the energy sector has not only shed a sizable portion of its workers over the last two recessions, but also that this reduction in labour is likely permanent. We also see that jobs in the public sector have grown in size relative to the overall workforce, while jobs in more traditional sectors like energy, agriculture and tourism have fallen. As well, there is limited evidence jobs in emerging industries like tech, life sciences and financial services have materialized, yet recent trends remain encouraging.

All of that led us to the question: what comes next for Alberta's economy? Predicting the future is almost always a futile endeavor, especially when we are reminded that events like COVID-19 can wipe out our forecasts in an instant. Still, it's human nature to try to peer into what lies ahead.

For Alberta's economy, the future remains bright — but only if active planning and intentions are taken now. These may include some well-considered improvements to the business environment, such as measures to boost efficiency, competitiveness and productivity. But these recommendations will be left for others to make.

The path forward for Alberta discussed here involves the adoption of values and principles.

- placing greater priority on education to ensure a high quality, flexible and adaptable workforce in the future;
- fostering greater social inclusivity and diversity by actively combatting racism, misogyny and xenophobia will strengthen the social fabric and generate greater innovation and creativity in the workplace.
- upholding Alberta's reputation and improving its brand will help attract and retain young, talented and globally mobile workers; and
- looking positively toward the future will help Alberta shake off its nostalgia for the past

These values are at a high level; specific actions and policies should be viewed through their lenses. If Albertans allow these values to permeate the culture, the province's economy will continue to be healthier, more balanced and more prosperous for all.

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CHAPTER 4

THE VIEW FROM BUSINESS

Ken Kobly, FCPA

INTRODUCTION

It is an understatement to say the COVID-19 pandemic and resulting global recession that coincided with a historic collapse of oil prices presented an unmatched challenge for Alberta business. This combination of circumstances presented not only a unique challenge for businesses, but also a unique challenge for the organizations that serve them.

The Alberta Chambers of Commerce (ACC) has been directly involved in supporting businesses and business organizations as they navigate and attempt to survive these economic circumstances. As the advocate for Alberta business, the ACC also continuously advances business interests, working to create a competitive business environment and position Alberta for future economic stability and growth. Given the significant and ongoing economic challenges Alberta is facing, this role has become increasingly important over the course of the COVID-19 pandemic and oil price collapse. It is this advocacy work that will be the focus of this paper.

This paper will start by providing background on the ACC and the process and sources that inform its advocacy. Then, it will highlight key gaps and opportunities for Alberta's business operators and decision makers as well as relevant ACC policy to help address these gaps. Where relevant, it will also briefly discuss active ACC initiatives designed to contribute to the province's economic recovery.

BACKGROUND

The main role of the Alberta Chambers of Commerce is to advocate on behalf of Alberta business. Unlike the traditional chamber of commerce model, the ACC's primary members are not individual businesses. Instead, the organization represents 122 community-based chambers of commerce across Alberta which, in turn, represent more than 24,000 businesses. While Alberta's community chambers range widely in size and scope, there is at least one chamber in each federal and provincial electoral district. Each community chamber is a member of the ACC, a situation that is unique within Canada. The comprehensive membership of the ACC federation allows Alberta's chambers to speak with a unified voice, effectively representing businesses of all sizes across all regions of the province. The programs and advocacy work detailed in this paper are efforts of this entire Alberta chambers network rather than the Alberta Chambers of Commerce alone as a narrowly defined organization. As shorthand, this paper will refer to the collective work of this federation as simply "the ACC" or "the ACC network".

While this paper focuses on the path forward from the economic challenges of 2020-2021, a brief treatment of ACC work in the period leading up to this time is necessary to provide context for current recommendations. Although a multitude of factors over many years have influenced Alberta's current economic situation, this paper will focus on the advocacy and recommendations informed by three recent sources: the official policy positions developed and adopted by the ACC network, the Vision 2020 white paper series and the Alberta Perspectives market research program. This paper will provide a brief overview of each of these three initiatives below.

The foundation of ACC advocacy is official policy positions of the Alberta chambers network, which are established during the annual policy cycle. Each year, Alberta's community chambers submit policy proposals for consideration during the network's annual general meeting. Policy proposals must meet four criteria: be specific and complete; be reasonable, relevant and attainable; include recommendations capable of being assessed, measured or evaluated; and be of provincial, national or international importance. At the annual general meeting, accredited voting delegates may approve, defeat or refer proposed policies. Proposed policies must be approved by a majority of voting delegates in order to be adopted as official ACC positions.

Approved policy positions remain valid for three years, at which point they are either allowed to lapse (if, for instance, the policy outcomes have been achieved or the recommendations are no longer topical) or may be updated and submitted for renewal by a sponsoring community chamber. ACC policy positions span a vast range of topics and may include any recommendations within the jurisdiction of either the provincial or federal government.

In terms of more specific advocacy projects, Vision 2020 was a public policy research project conducted by the ACC in partnership with Certified General Accountants (CGA) of Alberta. Vision 2020 was a broad-based project designed to better understand Canada and Alberta's social and economic policy options. The project resulted in the publication of four white papers between 2004 and 2010, which are available to view on the ACC website.

Nearly a decade after the final white paper of Vision 2020 was published, the ACC embarked on another large-scale research program. In May 2019, almost immediately following that year's provincial election, the ACC launched an ongoing market research program called Alberta Perspectives. The purpose of the Alberta Perspectives program is to gather high-quality, longitudinal data from Alberta's business community and public alike. The program centres on three areas of strategic interest: provincial priorities, municipal competitiveness and skills and labour market policy. The data gathered through this program then informs ACC network advocacy to local, provincial and federal governments. To ensure statistical validity and rigor of the program, the ACC has contracted the Canadian research advisory firm The Strategic Counsel to assist with survey administration and analysis.

The Alberta Perspectives market research program complements the traditional policy process detailed above, both by providing up-to-date data for policy drafters to reference and by enabling the ACC to quickly respond to rapidly emerging or developing issues. By monitoring numbers and regions of respondents, the ACC and The Strategic Counsel can confirm survey data reflect a representative sample — ensuring the resulting advocacy accurately reflects Alberta's business community.

In 2020, the ACC expanded the Alberta Perspectives program by launching Alberta's first online business insight community. The Alberta Perspectives community is an online hub designed to gather additional insights on emerging issues, with granularity down to the postal code. With more than 750 business leaders registered to the community as of March 2021, the ACC network has been able to track impacts of the oil price decline and COVID-19 pandemic on Alberta's business community almost in real time.

GAPS AND OPPORTUNITIES

A persisting finding of the Vision 2020 research project was the importance of fiscal prudence. In 2005/06, the ACC and CGA estimated Alberta could save between 30 and 40 per cent of all non-renewable resource revenue each year without requiring significant corresponding spending cuts (Milke 2006). Fifteen years after this finding, Alberta is in a precarious financial position, in large part due to a collapse in energy prices and therefore significantly diminished resource revenues. A recent Fraser Institute article shows that as of 2010, the Alberta had no net debt and therefore modest debt interest payments of \$472 million, representing 1.2 per cent of annual revenues. However, by 2019, debt interest payments had increased to \$2.2 billion (4.8 per cent of government revenue) and are forecasted to climb even further to \$2.8 billion (6.3 per cent of revenue) for the 2021/22 fiscal year (Eisen and Lafler 2021). Meanwhile, the debate of how to best steward non-renewable resource revenues has continued over this period, but without the buffer of provincial savings or the same revenue potential from non-renewable energy sources.

Those involved in Vision 2020 were not anticipating the unprecedented economic pressures of a global pandemic coinciding with a historic energy price collapse. And indeed, it would be hyperbolic to claim saving 30 to 40 per cent of non-renewable resource revenues through the Heritage Fund would have completely avoided the fiscal situation Alberta is in as of 2020/21. However, the benefit of hindsight has further reinforced this recommendation of fiscal prudence and, even greater, has reinforced the importance of responding to recommendations from Alberta's business community. After all, Alberta's business operators — and the Albertans they employ — are among the hardest hit when an economic disruption inevitably occurs. Had Alberta's governments over the past 15 years saved 30 to 40 per cent of non-renewable resource revenues, the province would undeniably be in a better position to weather this economic storm.

The Alberta Perspectives research program has also broadly examined business and public opinions around the province's finances and fiscal management. As of July 2020, 68 per cent of business respondents and 51 per cent of public respondents perceived Alberta's financial situation to be either "poor" or "very poor", compared to 51 per cent and 44 per cent respectively the year prior (The Strategic Counsel 2020c, 20). In the same survey, 92 per cent of business respondents and 89 per cent of public respondents indicated they were either "very concerned" or "somewhat concerned" about the state of the province's finances (The Strategic Counsel 2020c, 20).

In terms of fiscal management, as of July 2020, a majority of both business and public survey respondents considered Alberta running a deficit for a number of years to be unacceptable. Fifty-five per cent of business respondents and 50 per cent of public respondents saw running a deficit to be unacceptable — a decrease in both categories from 2019, when 69 per cent of business respondents and 69 per cent of public respondents believe a deficit was unacceptable (The Strategic Counsel 2020c, 24). In other words, businesses and members of the public alike viewed deficits as more acceptable in 2020 than 2019, likely due to the COVID-19 pandemic.

On the whole, and especially considering these findings, the ACC supports the recommendations of the MacKinnon Report on Alberta's Finances as a path to restoring the province to balanced budgets. The ACC policy "Returning Alberta to Balanced Budgets" also makes the following specific recommendations:

1. Establish a long-term plan to achieve a balanced budget by eliminating operational expenditure growth.
2. Adopt an ongoing position of fiscal restraint and controlled spending by launching a full program and service review, including input from external stakeholders, as is being done in Alberta's largest cities, and report publicly on the results of this review.
3. Consult broadly with external stakeholders regarding the optimal approach to stabilize government revenues and expenditures, including an assessment of all available revenue options and tools, as well as cost containment, service level examination and fiscal restraint measures.
4. Negotiate government labour agreements due for renewal with a target of no staffing increases and zero percent increases in salaries until the currently depressed labour market has turned positive and rebounded sufficiently to justify wage growth (Alberta Chambers of Commerce 2018b)

While Alberta Perspectives research highlights challenges with government spending, it also focuses on the revenue side of the equation. In terms of public opinion, there is significant support from both the business community and members of the public for diversification. July 2020 Alberta Perspectives survey findings identified the diversification of Alberta's economy beyond oil and gas as a top priority for business and public respondents alike. Sixty-three per cent of business respondents identified diversification as a "very important" priority, with 66 per cent of respondents ranking it among their top three priorities. Public support was only slightly lower, with 57 per cent of respondents believing diversification to be "very important" and 58 per cent ranking it among their top three priorities (The Strategic Counsel 2020c, 29). While public support stayed the same at 57 per cent from July 2019 to July 2020, business support grew from 52 per cent to 63 per cent (The Strategic Counsel 2020c, 29). Our network has been calling for a complete review of all available revenue options, with a goal to ensure stability and prudent financial planning. The growing support among those in the business community for diversification further strengthens this call.

While public opinion favours diversification, both business operators and members of the public overwhelmingly continue to view the oil and gas industry as very significant for Alberta's economy. As of July 2020, 82 per cent of both business and public respondents saw the oil and gas industry as either "vitaly important" or "very important". A majority (51 per cent) of respondents in each category also anticipated the industry would continue to be as important as it is today over the next few years (The Strategic Counsel 2020c, 19).

Alberta Perspectives data also highlight the potential for enhanced governance through engagement with the business community. While the data gathered through

Alberta Perspectives cannot establish causation, they suggest a strong correlation by drawing on representative samples.

A key finding of this research is that government engagement with business operators correlates with increased business confidence. Overall, more than half of business (57 per cent) reported a negative view on the long-term future of the province as of December 2020 (The Strategic Counsel 2020a, 16). However, those who had been contacted by an elected official were slightly more positive (42 per cent) about Alberta's long-term future than those who were not (36 per cent) (The Strategic Counsel 2020a, 16).

Again, this finding can only be understood as a correlation due to the nature of these data. However, logically, the finding that increased communication with decision makers enhances business confidence makes sense. Even without establishing causation, there is little risk, but significant potential benefit, to elected officials increasingly making intentional contact with local business operators. The data indicate three quarters of business respondents (74 per cent) have not been contacted by an elected official of any order of government within the last year (The Strategic Counsel 2020a, 22). This finding highlights a major gap in — and opportunity for — government engagement, particularly given the unique challenges Alberta businesses continue to face. With a majority of business respondents maintaining a negative view in the long-term future of the province, this research suggests increased outreach of elected officials could positively impact the attitudes of business operators. It is reasonable to hypothesize that improved confidence of business operators could positively impact their actions as Alberta heads towards economic recovery.

Alberta Perspectives labour market research shows that despite Alberta's many choices for high-quality primary, secondary and post-secondary education, there is a clear gap in development of in-demand skills. As of April 2020, more than half of business respondents found it difficult to hire people with the entry-level (54 per cent) or mid-level (65 per cent) skills they needed (The Strategic Counsel 2020b, 16). Forty-four per cent of these same business operators also anticipated skills shortages would have a significant or moderate impact on their business's ability to thrive over the next year (The Strategic Counsel 2020b, 17).

While identifying gaps, this research also provides guidance on specific skill gaps and in-demand competencies. In April 2020, the ACC asked business operators to identify both the top five people skills and competencies and top five technical skills and competencies they look for when hiring at any level within their organization. Survey respondents indicated the top people skills and competencies they look for to be problem-solving skills (60 per cent), service orientation (56 per cent) and commitment to quality (54 per cent) (The Strategic Counsel 2020b, 14). Among their top technical skills, business operators primarily looked for industry-specific technical skills (61 per cent) followed by fundamental skills: basic numeracy and literacy (54 per cent); basic business acumen (44 per cent); and basic science and math skills (33 per cent) (The Strategic Counsel 2020b, 14). While final analysis is not yet complete at the time of writing, early results from the same survey conducted in 2021 show a similar breakdown.

As a result of longstanding engagement with job creators and — more recently — Alberta Perspectives research, a priority of the ACC network is to align skill development with labour market needs. The ACC has increasingly been involved in facilitating connections between the business and educational communities to help bridge this gap, drawing on proven models including MicroSociety and business apprenticeship. In fact, it is specific ACC policy to “[e]ncourage Alberta school boards to create MicroSocieties in k-8 schools across the province with the goal of at least 1 per district by 2025” (Alberta Chambers of Commerce 2018a).

To further facilitate business-education communication, the ACC recently struck a talent development task force in partnership with the Council of Post-Secondary Presidents of Alberta (COPPOA). The mandate of the task force is to inform a provincial development strategy, with a goal of aligning post-secondary programming with business growth opportunities. The committee will also be working to expand work-integrated learning opportunities for post-secondary students, which is expected to be a key part of fulfilling this goal. The task force is made up of individuals from post-secondary institutions, the business community and funding leaders representing regions across the province.

The final area this paper will cover is the broad opportunity of enhanced business competitiveness. Like the topics discussed so far, it would be impossible to provide a complete treatment of Alberta’s economic competitiveness within a single paper. And indeed, all of the topics covered so far play a role Alberta’s competitiveness. However, as a starting point, this paper will outline some additional areas of note below, with a focus on municipal regulations.

Municipal regulations significantly factor into Alberta’s overall competitiveness. Broadly, Alberta Perspectives research shows municipal competitiveness is a significant area of opportunity. Based on December 2020 research, only 17 per cent of respondents would recommend their municipality as a place to invest or start a business. With 56 per cent of respondents indicating they would not recommend their municipality as a place to do business, Alberta municipalities on the whole were assigned a net promoter score of -39 at the time of this survey — a seven-point drop from the previous year (The Strategic Counsel 2020a, 30).

Through Alberta Perspectives, business operators identified a variety of local and provincial levies, taxes and fees they categorize as detrimental to their business growth and/or competitiveness. Topping this list are insurance premiums tax, small business tax, municipal franchise fees, municipal utilities and corporate income tax (The Strategic Counsel 2020a, 17). Nearly half of respondents (45 per cent) did not believe any of the charges listed in the survey benefited their business — something that may indicate the general level of frustration business operators were experiencing at the time of this research (The Strategic Counsel 2020a, 18).

The ACC has multiple current policy positions relating to economic competitiveness. For instance, the policy “Predictable, Fair and Transparent Market Value Assessments” deals with the issue of fluctuating property value assessments and the corresponding tax increases that fall on property owners. The policy includes various

recommendations to increase transparency and predictability of assessments, including clarifying methodology; increasing consultation with local experts and stakeholders; establishing specific, transparent criteria for subjective metrics; flagging irregularities and performing individual follow up; and better distinguishing between municipal and provincial roles and responsibilities (Alberta Chambers of Commerce 2020). While providing an overview of all relevant policies falls outside the scope of this paper, all current policies are posted in their entirety on the ACC website.

CONCLUSION

While the economic challenges of the COVID-19 pandemic and record low oil prices are complex and multi-faceted, research within Alberta's business community does highlight some key gaps and areas of opportunity. It would be reductionist to claim the research cited within this paper, from ACC policy positions, Vision 2020 and the Alberta Perspectives program, provides a complete treatment of issues facing Alberta business, or even a complete treatment of the specific areas discussed in this paper. Indeed, it would be impossible to fully detail in a single paper the breadth and depth of issues facing Alberta business as our province embarks towards economic recovery. Nevertheless, this research does suggest Alberta's business community — and therefore, the province's economic recovery — stands to benefit from long-term fiscal stability, diversified revenue opportunities, increased government engagement, enhanced skills training and a more competitive regulatory framework. While far from an exhaustive list, these areas of opportunity are all complex and multi-faceted within themselves. The research and policy recommendations contained within this paper are therefore only intended to suggest starting points. Most importantly, this discussion is intended to draw attention to specific attitudes and concerns of Alberta's business community. Engagement and communication with Alberta's job creators will be even more important than before as Alberta works to economically stabilize and rebuild.

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CHAPTER 5

GENDER DISPARITIES IN THE LABOUR MARKET? EXAMINING THE COVID-19 PANDEMIC IN ALBERTA*

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INTRODUCTION

On March 5, 2020, Alberta reported its first case of the novel coronavirus disease (COVID-19). Shortly after, extensive measures were taken to “flatten the epidemic curve” and contain the spread of the virus: schools and daycares closed on March 15, a state of public health emergency was declared on March 17, and the closure of non-essential businesses and services was mandated on March 27. The impacts of these social distancing efforts on Alberta’s labour market were large and immediate. In a year-over-year comparison, data from April 2020 shows that employment in Alberta declined by 15.5 per cent, while the unemployment rate increased to 13.4 per cent (Alberta Treasury Board and Finance 2020).

As the government started to relax public health restrictions over the summer months, Alberta’s labour market showed promising signs of recovery (Business Council of Alberta 2020). However, by mid-September 2020, COVID-19 cases began to rise again, with Alberta’s COVID-19 cases reaching new daily record highs throughout fall 2020 (see Figure 1). A second state of public health emergency was declared on November 24,¹ which was followed by further social and economic restrictions on December 8.² Similar to the first round of social distancing measures, these restrictions brought further turmoil to Alberta’s labour market, including reduced working hours, increased unemployment, or complete non-participation in the labour force all together.

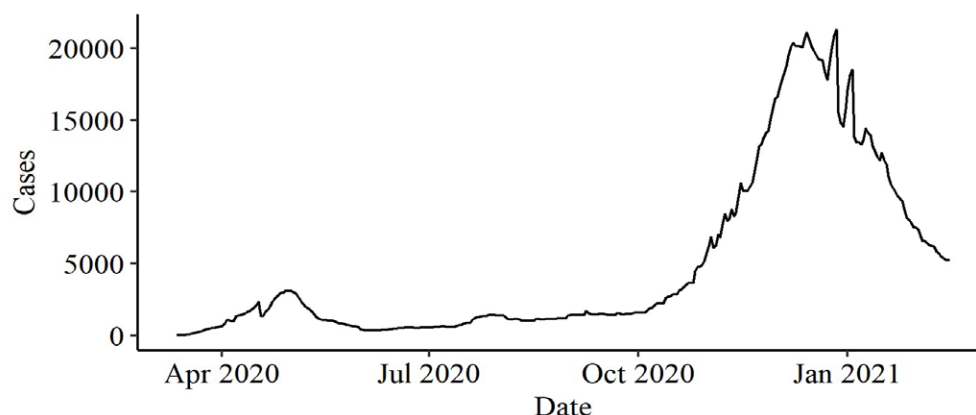
In this chapter, we use data from Statistics Canada’s Labour Force Survey (LFS) to explore the health of Alberta’s labour market amid the twin-crises of low energy prices and the crippling COVID-19 pandemic. To get a sense of the differential impacts of these crises across socioeconomic groups, we examine their impact on employment, hours worked, part-time employment and labour force participation across gender, parental status, and age. Because researchers and policymakers in Canada have been particularly concerned about the potential gendered effects of the COVID-19 crisis (Alon et al. 2020; Montenovo et al. 2020; Stevenson 2020; Qian and Fuller 2020)³, in our main analysis, we focus on whether and to what extent the pandemic produced differential labour market effects for women versus men (with and without children).

¹ For additional details on the restrictions imposed by Alberta’s government in November see Cameron-Blake (2021) and Pearson (2020).

² This included: i) prohibition of all indoor and outdoor social gatherings, including limiting in-home contact to household members only; ii) mandatory working from home when physical presence was not required; iii) mandatory closure of restaurants/bars/cafes, entertainment businesses, and personal and wellness services; and iv) all K-12 students returning to online learning for the first week of school in January. See CBC News (2020) for further details.

³ For example, in a February 2021 press release for the Feminist Response and Recovery Fund, the Government of Canada emphasized that “the COVID-19 pandemic has magnified systemic and longstanding inequalities, with women and girls disproportionately affected by the crisis” (Women and Gender Equality Canada, 2021). Similar concerns about an asymmetric economic recovery for women have been expressed by the federal government in the 2020 Fall Economic Update (Department of Finance, 2020).

Figure 1: Number of Active COVID-19 Cases in Alberta, March 12, 2020-February 15, 2021



Source: Government of Canada Public Health Infobase, 2020-2021. Tabulations by authors.

We first present a descriptive analysis of labour market outcomes before and during the COVID-19 pandemic by age, gender, education, parental status, and geography. While labour market losses are widespread, our analysis shows that women, individuals aged between 15 and 29, individuals with lower educational achievement, and residents of the tourism and hospitality-heavy regions in the Rockies were disproportionately impacted by the COVID-19 economic shutdowns. Second, we perform a regression analysis showing that: i) women were more adversely impacted than men at the onset of the pandemic; ii) differences between men and women stabilized in the summer months; and iii) the stabilization of gender differentials persisted into December 2020. Crucially, for policymakers, we also find that parents with young children in Alberta experienced a large deterioration in employment during both the first and second waves of the COVID-19 pandemic. Finally, we provide evidence of a staggering decline in cumulative formal, paid hours worked for parents, irrespective of gender.

ALBERTA'S COVID-19 PANDEMIC AND THE LABOUR MARKET

Table 1 displays descriptive statistics for our sample of LFS respondents from Alberta in 2019 and 2020.⁴ Panel A contains summary statistics for employed respondents (either absent from or at work) only, while panel B contains summary statistics for all LFS respondents (i.e., employed, unemployed, and not in the labour force). Examining panel B, there is a clear reduction in both employment (at work) and average total actual hours worked (all jobs) between the two years. Overall, labour force participation declined by 2 percentage points, while part-time employment remained the same at 18 per cent. Average wages increased slightly between the two years; this is likely because job losses have been heavily concentrated in low-wage jobs so that the wages among individuals who remained employed throughout the pandemic are, on average, higher.

⁴

Note that the employment rate and labour force participation rate are higher than the real employment and labour force participation rate in Alberta because of sample selection.

In terms of the composition of our sample, there are no remarkable differences between the pre- and post-pandemic years. In both years, almost half of the sample is comprised of women. About 19 per cent of respondents work in the public sector, and roughly 25 per cent are covered by a collective agreement. The majority of LFS respondents: i) are married; ii) are non-students; and iii) do not have any children residing in the household. Of those with children, the presence of a child under the age of 6 is the most common, followed by children aged 6-12. Finally, there is a relatively even distribution of ages in our sample, though there are very few respondents who are older than 65.

Table 1: Descriptive statistics, 2019 and 2020

	2019	2020
Panel A: Employed respondents (absent or at work)		
Average total actual hours worked (all jobs)	33.90 (17.44)	32.29 (18.16)
Part-time employment (%)	18 (.38)	18 (.39)
Average hourly wage (\$)	31.39 (15.66)	32.89 (16.10)
Average job tenure (months)	82.21 (78.03)	86.80 (77.75)
Public (%)	19 (.39)	20 (.40)
Union (%)	25 (.43)	26 (.44)
N	80,308	64,772
Panel B: All respondents		
Average total actual hours worked (all jobs)	30.42 (19.46)	27.15 (20.42)
Employed, at work (%)	82 (.38)	75 (.44)
Employed, absent from work (%)	7 (.26)	9 (.29)
Labour force participation (%)	94 (.24)	92 (.28)
Female (%)	46 (.50)	46 (.50)
Married* (ref: single) (%)	63 (.48)	64 (.48)
Children		
None (%)	63 (.48)	61 (.49)
Youngest child < 6 (%)	14 (.35)	15 (.36)
Youngest child 6-12 (%)	11 (.32)	11 (.32)
Youngest child 13-17 (%)	6 (.24)	6 (.25)
Youngest child 18-24 (%)	5 (.23)	6 (.24)

Low education** (%)	30 (.46)	29 (.45)
Student		
Non-student (%)	92 (.27)	92 (.28)
Full-time (%)	6 (.24)	6 (.24)
Part-time (%)	2 (.14)	2 (.14)
Immigrant	24 (.43)	23 (.42)
Age Group		
Age 15-24 (%)	14 (.35)	14 (.34)
Age 25-34 (%)	23 (.42)	23 (.42)
Age 35-44 (%)	23 (.42)	24 (.43)
Age 45-54 (%)	19 (.39)	19 (.39)
Age 55-64 (%)	15 (.36)	16 (.36)
Age 65+ (%)	5 (.22)	5 (.21)
N	89,644	76,697

Notes: Summary statistics are computed with LFS survey weights. Unweighted sample sizes reported. Figures in brackets show the standard deviation. * Married includes common-law relationships. ** Low education includes individuals who have secondary education or less. Proportions may not sum to 1 due to rounding. Sample excludes: i) unpaid family workers; ii) respondents who have never worked; and iii) respondents who are not employed and who last worked more than a year ago.

Source: Canadian Labour Force Survey, public-use microdata files, 2019-2020. Tabulations by authors.

It is clear in Table 1 that survey response declined substantially over the course of the pandemic. Overall, between 2019 and 2020 there is a reduction of 12,947 respondents. While this may be potentially problematic if those still responding to the LFS are more (or less) likely to be employed during the pandemic than those who are not responding, Table 1 suggests that the use of survey weights adequately corrects for the possibility of a non-representative sample due to non-random attrition.

In Table 2, we present data on changes in employment rates, labour force participation rates, average weekly hours worked, and the share of employment in part-time occupations across several different demographics of interest.⁵ Note that, in order to reflect pre- and post-COVID-19 samples over the same seasonal period, these statistics include all data between March and December in 2019 and 2020.

⁵

Note that the employment rate is the percent of the total surveyed population that is employed. Labour force participation rates include both employed and unemployed individuals (i.e. those who are not working, are actively searching for work, and are able to do so) as a percent of the surveyed population. Finally, the share of employment in part-time occupations is the percent of total employed persons working in a part-time occupation (less than 30 hours per week).

Across gender, age, parental status, education, and geography, declines in the Alberta labour market due to the COVID-19 economic crisis have been wide-ranging. The raw differentials we present in Table 2 suggest that, overall, the following groups have experienced especially large labour market consequences during the pandemic: i) women; ii) individuals under the age of 30; iii) individuals with less than a bachelor's degree; iv) and residents of Edmonton.⁶ Across the four labour market statistics presented, the largest reductions are seen in employment rates. We do not observe movements of a similar magnitude for labour force participation. This suggests that many individuals shifted into unemployment rather than complete non-participation—i.e., many respondents may have been temporarily laid off or were still searching for work despite heavy losses in employment. Furthermore, the reduction in labour market hours worked is shown to be uniform across all demographics. Table 2 also indicates that the 15–29-year-old cohort experienced a slight increase in part-time employment during the pandemic.

Table 2: Changes in labour market statistics between 2019 and 2020, March – December

	Employment Rate			Labour Force Participation Rate			Average Weekly Hours Worked			Part-Time Employment (% of Employed Persons)		
	2019	2020	Diff.	2019	2020	Diff.	2019	2020	Diff.	2019	2020	Diff.
Men (15-29)	83.3 (37.3)	74.0 (43.9)	-9.3 (0.8)	89.2 (31.0)	86.7 (34.0)	-2.5 (0.6)	29.0 (20.4)	23.5 (20.7)	-5.5 (0.4)	21.0 (40.7)	23.9 (42.6)	+2.9 (0.9)
Men (30-54)	94.2 (23.4)	89.9 (30.2)	-4.3 (0.3)	98.2 (13.1)	97.2 (16.4)	-1.0 (0.1)	37.3 (18.9)	33.8 (20.7)	-3.5 (0.3)	4.9 (21.5)	5.5 (22.8)	+0.6 (0.3)
Women (15-29)	84.9 (35.8)	72.5 (44.7)	-12.4 (0.8)	89.6 (30.5)	84.4 (36.3)	-5.2 (0.7)	23.7 (17.4)	18.4 (17.8)	-5.3 (0.4)	34.8 (47.6)	37.0 (48.2)	+2.2 (1.1)
Women (30-54)	93.6 (23.9)	87.5 (33.0)	-6.1 (0.3)	96.3 (18.9)	93.9 (24.0)	-2.4 (0.3)	28.6 (17.3)	25.4 (18.7)	-3.2 (0.2)	21.0 (40.7)	21.1 (40.8)	+0.1 (0.5)
Parents (Child <13, Men)	95.4 (20.9)	91.4 (28.1)	-4.0 (0.5)	98.7 (11.2)	97.6 (15.4)	-1.1 (0.2)	38.0 (18.6)	34.2 (20.3)	-3.8 (0.4)	3.9 (19.2)	5.1 (22.0)	+1.2 (0.4)
Parents (Child <13, Women)	92.2 (26.8)	86.7 (34.0)	-5.5 (0.6)	94.7 (22.5)	92.7 (26.0)	-2.0 (0.5)	24.8 (17.8)	21.9 (18.8)	-2.9 (0.4)	27.8 (44.8)	26.6 (44.2)	-1.2 (0.9)
Parents (Child >=13, Men)	95.2 (21.4)	90.6 (29.2)	-4.6 (0.7)	98.1 (13.5)	96.4 (18.5)	-1.7 (0.4)	37.7 (18.8)	33.5 (20.9)	-4.2 (0.6)	4.0 (19.7)	5.8 (23.3)	+1.8 (0.7)
Parents (Child >=13, Women)	95.3 (21.1)	89.1 (31.1)	-6.2 (0.7)	97.1 (16.8)	94.3 (23.1)	-2.8 (0.6)	30.1 (16.6)	26.6 (18.0)	-3.5 (0.5)	22.6 (41.9)	22.0 (41.4)	-0.6 (1.2)
Bachelor's Degree	92.8 (26.0)	88.5 (31.9)	-4.3 (0.4)	95.4 (20.9)	94.3 (22.8)	-1.1 (0.3)	31.1 (18.4)	29.1 (19.1)	-2.0 (0.2)	15.7 (36.4)	15.1 (35.8)	-0.6 (0.5)

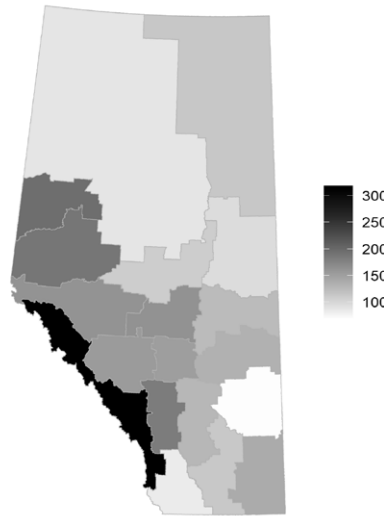
⁶ In fact, deteriorating economic conditions in Edmonton led the city to the highest unemployment rate in the nation (Johnson, 2020).

No Bachelor's	89.0 (31.9)	81.0 (38.6)	-8.0 (0.3)	93.5 (25.0)	90.3 (29.3)	-3.2 (0.2)	30.2 (19.9)	25.8 (20.9)	-4.4 (0.2)	19.0 (39.2)	19.6 (39.7)	+0.6 (0.3)
Calgary	90.2 (29.6)	83.9 (36.8)	-6.3 (0.4)	94.2 (23.3)	92.4 (26.4)	-1.8 (0.3)	30.1 (18.6)	26.7 (19.6)	-3.4 (0.2)	17.8 (38.2)	16.8 (37.4)	-1.0 (0.5)
Edmonton	90.2 (29.7)	82.8 (37.7)	-7.4 (0.4)	94.6 (22.7)	91.3 (28.1)	-3.3 (0.3)	30.2 (18.6)	26.2 (20.2)	-4.0 (0.2)	17.2 (37.7)	18.3 (38.6)	+1.1 (0.5)
Other Alberta	89.3 (30.9)	82.9 (37.7)	-6.4 (0.4)	93.2 (25.1)	90.6 (29.2)	-2.6 (0.3)	31.1 (21.4)	26.9 (20.5)	-4.2 (0.2)	18.7 (38.0)	18.9 (39.1)	+0.2 (0.4)

Notes: Labour market statistics are computed with LFS survey weights. Sample excludes: i) unpaid family workers; ii) respondents who have never worked; and iii) respondents who are not employed and who last worked more than a year ago. For the “2019” and “2020” columns, the parentheses denote the standard deviation, while the difference column reports the robust standard error. All estimates are rounded to one decimal place. From March 2019 to December 2019, we draw from a total sample of 73,941 unweighted survey respondents. Over the same period in 2020, our sample size is reduced to 62,615 individuals.

Source: Canadian Labour Force Survey, public-use microdata files, 2019-2020. Tabulations by authors.

Figure 2: Percent Change in EI Usage by Census Division, January 2021-January 2020



Source: Statistics Canada Table 14-10-0323-01. Tabulations by authors.

To gain a better understanding of the possible urban/rural or regional differences in labour market outcomes in the latter half of the pandemic, we use Employment Insurance (EI) data for census divisions in Alberta and take the year-over-year percentage change in the number of EI recipients between January 2021 and January 2020. These data are presented in Figure 2. We find that EI usage increased over 300 percent in the census division including Banff, Canmore and Jasper. With a heavy reliance on the tourism and hospitality industries, this region stands out sharply compared to the rest of the province. Indeed, the hospitality-heavy regions appear to be more impacted than the energy-intensive regions, which were also recovering from a subsequent decline in the price of oil. Comparatively, the least afflicted region is the rural and sparsely populated census division in the central-east part of the province. Notably, all regions were at least 60 percent above their pre-COVID-19 levels in January 2021.

While these descriptive statistics give some insight into the labour market impacts of the COVID-19 pandemic in Alberta, they are far from conclusive. To conduct a statistically rigorous analysis of the crisis, in the next section, we present the regression framework that we use to measure whether the impact of the pandemic has trended differently across time and sociodemographic groups and whether those differences exhibit statistical significance.

REGRESSION ANALYSIS

Based on the overwhelming policy interest in the impact of the COVID-19 pandemic on women and parents, in this section we perform a regression analysis to determine whether Alberta's economic shutdowns generated significant labour market differences between men and women and individuals with and without children. We use a difference-in-difference approach to investigate the impact of the COVID-19 pandemic on labour supply in Alberta. More specifically, for each group of interest, we compare labour force statistics from February 2020 to each of the post-COVID-19 months in 2020. We use February as our comparison month since it captures the most recent state of Canada's labour market before the onset of the crisis. To account for normal seasonal fluctuations in the labour market, we also use data from 2019.

Using weekly hours worked for men and women in March as an example, intuitively, this approach involves computing average hours worked separately for men and women in February 2020 and March 2020. We then take the difference between average hours worked in February 2020 and March 2020 for men and women. We do the same computation using data from 2019. Taking a second difference between average hours worked in 2020 and 2019 thus provides our double-difference estimate of the impact of COVID-19 on the labour market. To examine whether the pandemic produced differential effects across gender, we also take the difference in average hours worked between men and women, which provides our third difference.⁷

EMPIRICAL RESULTS

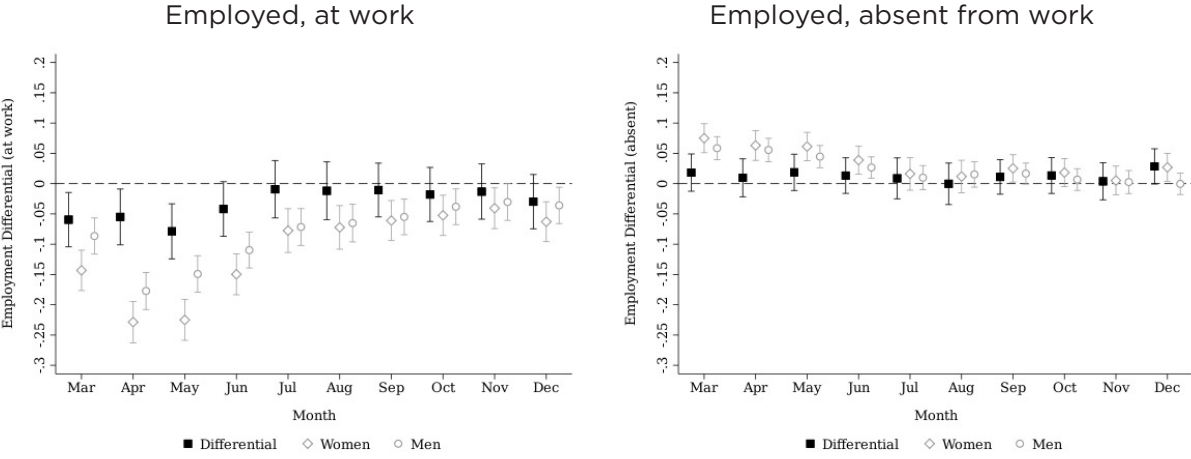
GENDER-BASED DIFFERENTIALS: HAS COVID-19 GENERATED A 'SHE-CESSION?'

Figure 3 plots the results of the employment regressions estimated using equation (1) and equation (2) for men and women. To be clear, the black squares represent the difference in employment between men and women, while the light grey diamonds/circles indicate the group-specific estimate. The vertical bars denote the 95 percent confidence intervals computed using robust standard errors. When the black vertical bars cross the zero line, there is no statistically significant difference between the groups; for example in the right-hand side of Figure 3, the black bars cross the line in every month, suggesting that there was no difference in the likelihood of being employed and absent from work between men and women.

⁷ The regression equation for the double difference takes the form $Y_{imt} = \alpha + \sum_{m=1}^{11} \delta_m \text{COVIDMonth}_m * \text{COVIDYear}_t + \sum_{m=1}^{11} \beta_m \text{COVIDMonth}_m + \theta \text{COVIDYear}_t + \gamma \mathbf{X}_{imt} + \varepsilon_{imt}$. The regression equation for the triple difference takes the form $Y_{imt} = \alpha + \sum_{m=1}^{11} \delta_m \text{Female}_i * \text{COVIDMonth}_m * \text{COVIDYear}_t + \sum_{m=1}^{11} \gamma_m \text{Female}_i * \text{COVIDMonth}_m + \pi \text{Female}_i * \text{COVIDYear}_t + \sum_{m=1}^{11} \eta_m \text{COVIDMonth}_m * \text{COVIDYear}_t + \mu \text{Female}_i + \sum_{m=1}^{11} \beta_m \text{COVIDMonth}_m + \theta \text{COVIDYear}_t + \gamma \mathbf{X}_{imt} + \varepsilon_{imt}$.

The panel on the left-hand side of Figure 3 presents estimates for the likelihood of being employed and at work while the panel on the right-hand side of Figure 3 presents estimates for the likelihood of being employed and absent from work. The left panel of Figure 3 confirms that women in Alberta experienced a disproportionate decline in employment relative to men in the first four months of the pandemic. The difference in the likelihood of employment (at work) between men and women is around five percentage points between March and June. These differences are significant at the 5 per cent level. However, the estimated gender differential converges to zero during the summer months and remains at a similar level through the fall and into December. Apart from December 2020, there are no statistically or economically significant differences between men and women in terms of the likelihood of being employed but absent from work during any month of the pandemic. Interestingly, our results suggest that Alberta’s second wave did not reproduce the large gender differentials that were observed in the beginning of the crisis. Instead, Figure 3 indicates that between July and December 2020, men and women have faced an almost identical decline (or gain) in employment—around six percentage points below pre-crisis levels.

Figure 3: Double- and triple-difference estimates of the effect of the COVID-19 pandemic on employment by gender, 2019-2020



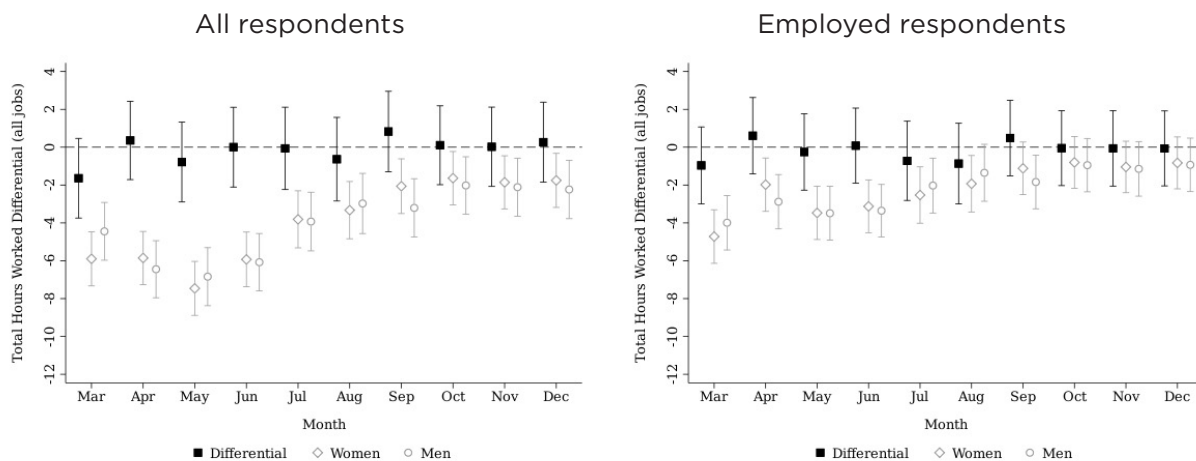
Notes: Figure 3 displays the regression results for each month of the pandemic estimated using equations 1 and 2. The dependent variable in the left panel is an indicator for employed and at work, while the dependent variable in the right panel is an indicator for employed and absent from work. The vertical bars denote the 95 percent confidence intervals computed using robust standard errors. The black squares represent the difference in employment between men and women (equation 2), while the light grey diamonds/circles indicate the group-specific estimate (equation 1 estimated separately for women and men). Controls include: a dichotomous variable equal to 1 if the respondent is married or in a common-law relationship, the age of the respondent (in 5-year age groups), the respondent’s highest level of educational attainment, and a dichotomous variable equal to 1 if the respondent’s youngest child is under the age of 13. Sample excludes: i) unpaid family workers; ii) respondents who have never worked; and iii) respondents who are not employed and who last worked more than a year ago.

Source: Canadian Labour Force Survey, public-use microdata files, 2019-2020. Tabulations by authors.

Although we observe a convergence in employment levels in the second half of 2020, labour market disparities between men and women may still exist if their actual hours worked are differentially reduced relative to pre-crisis levels. To investigate this, we plot the estimates for hours worked in Figure 4 for all LFS respondents (left panel) and only those who remained employed (right panel). Our results suggest that, early in the pandemic, both men and women experienced profound declines in weekly actual hours worked at all jobs.

For example, in May, actual hours worked declined by seven to eight hours on average for the entire sample of LFS respondents. Among those who were employed, the pandemic generated a significant reduction in hours worked of about four hours per week, on average. However, like the employment estimates, there is some gradual recovery over the course of the summer and fall months. We do not find any compelling evidence that there are statistically different reductions in hours worked between men and women in either group of respondents.

Figure 4: Double- and triple-difference estimates of the effect of the COVID-19 pandemic on actual hours worked by gender, 2019-2020



Notes: Figure 4 displays the regression results for each month of the pandemic estimated using equations 1 and 2. The dependent variable is a continuous measure of hours worked. The left panel contains estimates for the entire sample of LFS respondents (i.e., employed at work, employed absent from work, unemployed and not in the labour force), while the right panel contains estimates for employed respondents (at or absent from work). The vertical bars denote the 95 percent confidence intervals computed using robust standard errors. The black squares represent the difference in hours worked between men and women (equation 2). The light grey diamonds/circles indicate the group-specific estimate (equation 1 estimated separately for women and men). Controls include: a dichotomous variable equal to 1 if the respondent is married or in a common-law, the age of the respondent (in 5-year age groups), the respondent's highest level of educational attainment, and a dichotomous variable equal to 1 if the respondent's youngest child is under the age of 13. Sample excludes: i) unpaid family workers; ii) respondents who have never worked; and iii) respondents who are not employed and who last worked more than a year ago.

Source: Canadian Labour Force Survey, public-use microdata files, 2019-2020. Tabulations by authors.

In summary, while we document clear evidence of a 'she-cession' in the first round of economic shutdowns from the COVID-19 pandemic, we do not find evidence of a she-cession in Alberta's second round of economic shutdowns. While this suggests that the province may not need a gender-based recovery plan,⁸ it does not rule out the possibility that policy intervention is warranted among other groups. Indeed, because school and daycare closures have had profound effects on workers with young children, we investigate this group next.

⁸

Note that there are important gendered differences in labour market outcomes that existed prior to the pandemic which may require policy attention. These pre-crisis differences are distinct from the disparities that we are investigating in this paper (i.e., those generated by the pandemic).

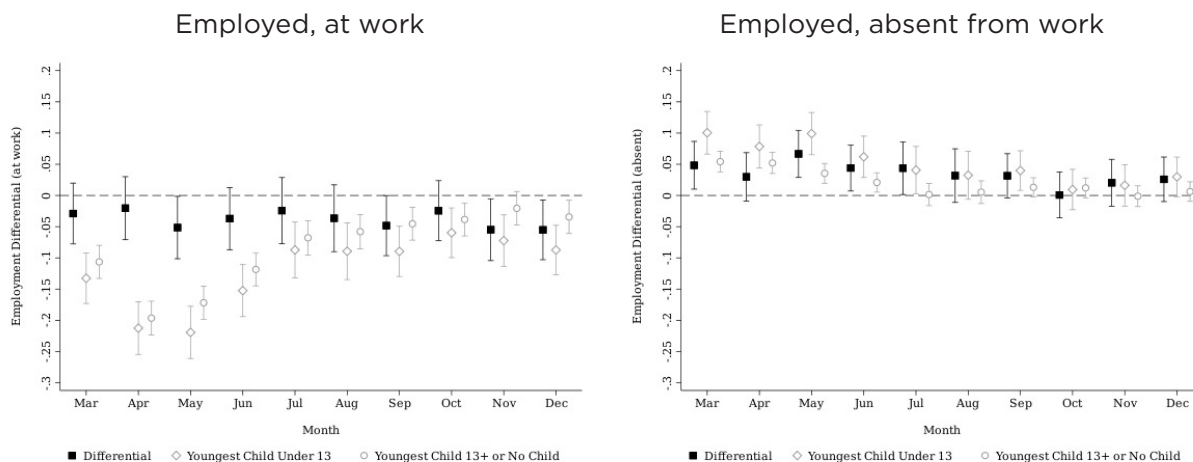
PARENT STATUS DIFFERENTIALS: DO YOUNG CHILDREN POSE UNIQUE LABOUR MARKET CHALLENGES?

The pandemic has presented a unique set of challenges to parents in Alberta, many of whom have had to balance their time between childcare and formal and informal work activities amid two province-wide states of emergency. School and daycare closures, in-home online learning, and isolation requirements resulting from exposure ultimately result in trade-offs between caregiving, parental supervision of learning activities, and paid employment. In turn, these trade-offs may generate adverse employment consequences for parents simply because a child is present in the household. This trade-off is likely to be especially large among people with younger children who require more attention and supervision (Montenovo et al., 2020).

In Figure 5, we compare the employment status of respondents whose youngest child is under the age of 13 to those whose youngest child is 13 years of age or older and those who have no child in the household at all. We focus on parents with children under the age of 13 as we believe that this age captures the point at which the trade-off between working in the labour market and providing childcare and parental supervision are likely the strongest.

Figure 5 shows that—except for May—between March and August, there are similar declines in the likelihood of being employed and at work among individuals with young children and individuals with older or no children. During the fall months, these gaps widen—particularly in November and December—suggesting that the school closures and the move to online learning associated with Alberta’s second round of social distancing measures were likely more detrimental to employment than the shutdown of non-essential businesses. The right-side panel of Figure 5 reveals further evidence that parents with young children have been especially impacted by the government’s social distancing measures: there are large, substantial differences between parents and non-parents in terms of absences from work among those who remained employed. In March, May, June and July, individuals with children under 13 years old were significantly more likely to be absent from work than those with older or no children in the household. During the fall months, these gaps are no longer statistically significant, but individuals with young children remain somewhat more likely to be absent from work than non-parents.

Figure 5: Double- and triple-difference estimates of the effect of the COVID-19 pandemic on employment by presence/age of youngest child, 2019-2020



Notes: Figure 5 displays the regression results for each month of the pandemic estimated using equations 1 and 2. The dependent variable in the left panel is an indicator for employed and at work, while the dependent variable in the right panel is an indicator for employed and absent from work. The vertical bars denote the 95 percent confidence intervals computed using robust standard errors. The black squares represent the difference in employment between respondents whose youngest child is under the age of 13 and respondents: i) whose youngest child is 13 years of age or older; or ii) who have no children at all (equation 2). The light grey diamonds/circles indicate the group-specific estimate (equation 1 estimated separately for these groups). Controls include: a dichotomous variable equal to 1 if the respondent is married or in a common-law relationship, the age of the respondent (in 5-year age groups), the respondent's highest level of educational attainment, and a dichotomous variable equal to 1 if the respondent is female. Sample excludes: i) unpaid family workers; ii) respondents who have never worked; and iii) respondents who are not employed and who last worked more than a year ago.

Source: Canadian Labour Force Survey, public-use microdata files, 2019-2020. Tabulations by authors.

There are two main reasons why the employment of parents may have continued to trend downward during the second wave of Alberta's pandemic. First, between September and December 2020, many parents may have elected to use online learning or to provide home schooling for their children rather than risk the uncertainties associated with a return to the classroom.⁹ Second, in October 2020, the federal government introduced the Canada Recovery Caregiving Benefit (CRCB). The CRCB provided \$500 weekly payments to households that had to reduce formal paid employment hours to provide child care.¹⁰ The availability of this income support coincides with the downward trends observed in Figure 5, suggesting that the CRCB may have also incentivized more parents to stay home with their children.

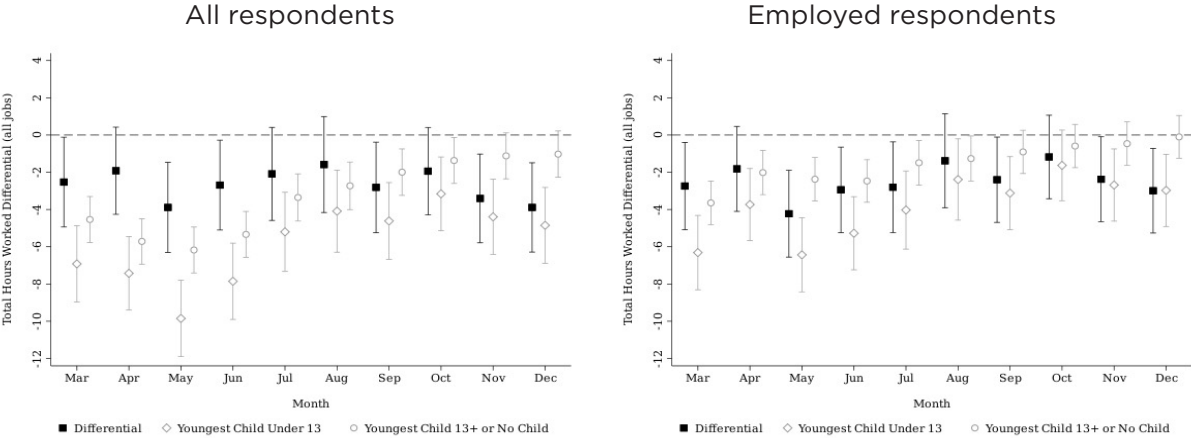
The findings presented in Figure 5 suggest that, even among parents who have maintained employment, there may be a substantial re-allocation of hours away from the labour market towards home production. We investigate this in Figure 6, which shows that the stable

⁹ Indeed, relative to 2019, the coronavirus has led to a near doubling of enrollment in provincial home-based schooling (Edwardson, 2020) – an option which is eligible for funding from the Alberta government. The ability to receive such funding may impact the labour market decisions of parents differently than non-parents (or parents with older children).

¹⁰ To be eligible for the CRCB, parents must have experienced a 50 percent reduction in weekly working hours because of a need to care for a child under 12. The CRCB is also available to individuals who have reduced their hours worked due to care for another family member that may have been affected by school, daycare or other care facilities. Eligibility also extends to individuals providing care for a child who is at a high-risk of contracting the COVID-19 virus.

differentials in employment observed early in the pandemic mask relatively large declines in hours worked among parents with young children. Subjugated to closures of childcare centres and schools to face-to-face learning, the challenges experienced by this group of workers are considerably different from the rest of the population as parental activities effectively reduce the amount of time available to do other things like formal, paid work in the labour market (i.e., constrained optimization). In most of the months in Figure 6, many of the differentials exhibit statistical significance and are typically in the range of two to four fewer hours worked per week for parents relative to non-parents. Specific to parents of young children, the change in hours worked relative to pre-COVID-19 levels was nearly ten hours less per week on average in May at the extensive margin (left panel). During the summer and fall months, this number reduced slightly to about six hours less on average in December.

Figure 6: Double- and triple-difference estimates of the effect of the COVID-19 pandemic on actual hours worked by presence/age of youngest child, 2019-2020



Notes: Figure 6 displays the regression results for each month of the pandemic estimated using equations 1 and 2. The dependent variable is a continuous measure of hours worked. The left panel contains estimates for the entire sample of LFS respondents (i.e., employed at work, employed absent from work, unemployed and not in the labour force), while the right panel contains estimates for employed respondents (at or absent from work). The vertical bars denote the 95 percent confidence intervals computed using robust standard errors. The black squares represent the difference in employment between respondents whose youngest child is under the age of 13 and respondents: i) whose youngest child is 13 years of age or older; or ii) who have no children at all (equation 2). The light grey diamonds/circles indicate the group-specific estimate (equation 1 estimated separately for these groups). Controls include: a dichotomous variable equal to 1 if the respondent is married or in a common-law relationship, the age of the respondent (in 5-year age groups), the respondent's highest level of educational attainment, and a dichotomous variable equal to 1 if the respondent is female. Sample excludes: i) unpaid family workers; ii) respondents who have never worked; and iii) respondents who are not employed and who last worked more than a year ago.

Source: Canadian Labour Force Survey, public-use microdata files, 2019-2020. Tabulations by authors.

The relatively greater loss in hours worked for parents with young children still leaves room for a potential gendered effect of the pandemic given that women tend to spend relatively more time on home production and childcare than men (Moyser and Burlock 2018). Are mothers bearing the brunt of increased home production duties? We turn to this question next.

EXAMINING DIFFERENTIALS BETWEEN MOTHERS AND FATHERS: WHO IS MAKING A BIGGER TRADE-OFF?

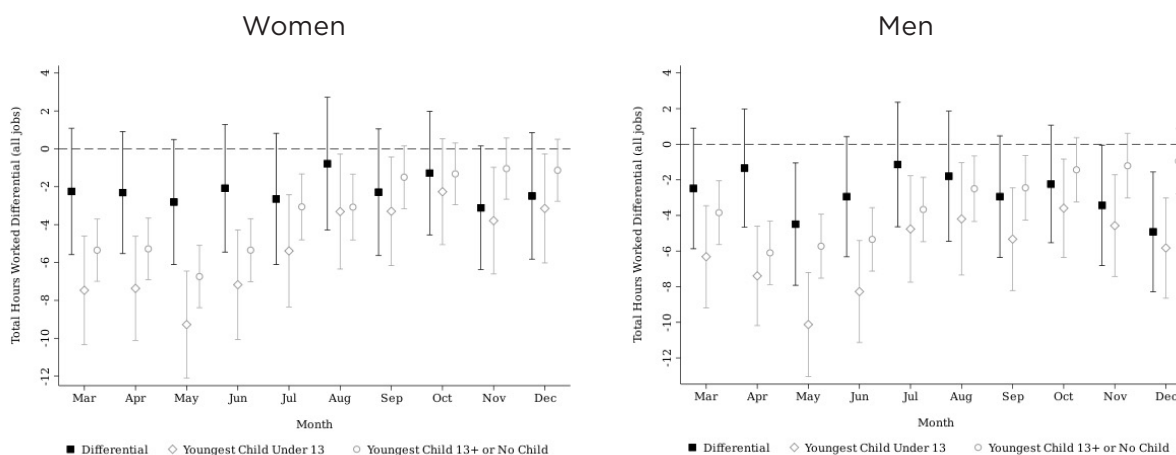
We start this section by noting that any documented differences in hours worked between men and women should be interpreted with the following caveat: if women with children worked fewer hours relative to men before the pandemic, then they ultimately had fewer hours to give up during the pandemic. In other words, if the pandemic generates a larger negative effect for fathers at the intensive margin, this may simply be because men with children had more hours available to lose given the pre-pandemic status quo in Alberta. We explore whether and how differences in pre-pandemic labour market participation impact the interpretation of our results at the end of this section.

Figure 7 shows the change in hours worked between 2019 and 2020 for respondents with young and older/no children, separately for men and women. During the second wave, there is an evident downward trend in working hours for both men and women with young children. While these trends are similar for both genders, there is a much greater decline in hours worked for men, particularly in November and December when the Alberta government introduced the second round of school closures. This is suggestive of more equitable sharing of parental duties and perhaps provides evidence that the pandemic may be shifting attitudes about the role of men in household work. This is consistent with other research in the UK showing that the pandemic has produced a substantial increase in the share of home responsibilities held by men (Alon et al. 2020; Chung et al. 2020; Shafer et al. 2020). Finally, all the point estimates are consistently below zero for both women and men with young children.¹¹ However, the difference in the reduction of working hours between these two groups is only statistically significant for men in May and the last two months of 2020.

¹¹

Note that conditioning the data in this way leads to smaller sample sizes and therefore a reduction in the precision of our estimates. While this is potentially concerning, there is little variability across the (separately) estimated months, which should provide readers with additional reassurance in our results.

Figure 7: Double- and triple-difference estimates of the effect of the COVID-19 pandemic on actual hours worked by gender and presence/age of youngest child, 2019-2020



Notes: Figure 7 displays the regression results for each month of the pandemic estimated using equations 1 and 2. The sample includes all LFS respondents (i.e., employed at work, employed absent from work, unemployed and not in the labour force). The dependent variable is a continuous measure of hours worked. The left panel contains estimates for women, while the right panel contains estimates for men. The vertical bars denote the 95 percent confidence intervals computed using robust standard errors. The black squares represent the difference in employment between respondents whose youngest child is under the age of 13 and respondents: i) whose youngest child is 13 years of age or older; or ii) who have no children at all (equation 2). The light grey diamonds/circles indicate the group-specific estimate (equation 1 estimated separately for these groups). Controls include: a dichotomous variable equal to 1 if the respondent is married or in a common-law relationship, the age of the respondent (in 5-year age groups), and the respondent's highest level of educational attainment. Sample excludes: i) unpaid family workers; ii) respondents who have never worked; and iii) respondents who are not employed and who last worked more than a year ago.

Source: Canadian Labour Force Survey, public-use microdata files, 2019-2020. Tabulations by authors.

A reoccurring theme in the data on labour market hours is the concept of *persistence* or the tendency for shocks, such as the COVID-19 pandemic, to have long-run effects that dissipate slowly. Because we observe steady reductions in working hours for parents of young children throughout the pandemic, persistence may be particularly concerning for this group. Cumulatively, this means that lower working hours will build up over time, leading to the potential for even greater differences between parents with young children and individuals with older or no children in the medium run. For example, a full-time parent working three hours less per week (relative to an individual without a child under the age of 13) would accumulate an excess loss of 120 hours between March and December—the equivalent of three full-time weeks—attributed to the pandemic effect alone. We examine this empirically in Figure 8, where we illustrate the loss of aggregate cumulative hours relative to 2019, noting that the difference in February is normalized to zero.¹²

Across all groups, the cumulative effect of the pandemic was most severe in the summer months, after which, some momentum in the labour market levelled out the differences relative to 2019. Nonetheless, by December, all gender-parent pairings saw large reductions in total hours worked. Figure 8 suggests that parents of young children (as highlighted by

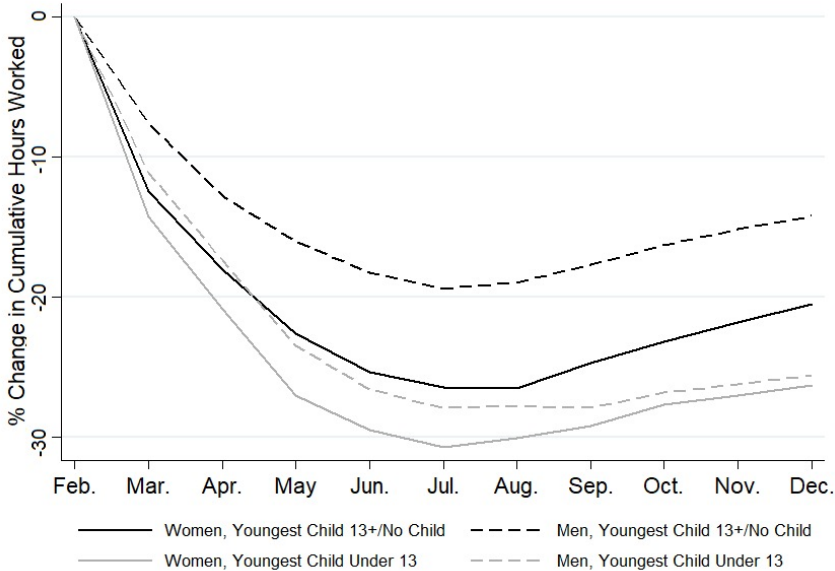
¹²

More specifically, we gather the cumulative sum of total hours worked by parental status and gender from February to December in 2019 and 2020. Then, we normalize these values such that the February amount is set to be 100 in both years. Finally, we take the log difference between 2020 and 2019.

the grey lines) experienced the most profound reductions in hours worked, and that men and women experienced nearly the same cumulative losses by the end of 2020. At 14 per cent, men without young children lost the smallest per cent of hours relative to 2019, while women with young children saw the largest declines by the end of 2020—26 per cent below their 2019 level. However, also note that by December 2020, the cumulative losses among men and women with young children were roughly at the same level. Given the large gaps between these two groups through the spring and summer months, this suggests that changes in hours worked among men in the second wave were substantial enough that they resulted in roughly the same cumulative losses by the end of December 2020.

Given our finding that the hours worked of men with young children have been particularly impacted in the second half of the COVID-19 crisis in Alberta, it is important to distinguish between what can be classified as a 'pandemic effect' and any normal economic disparities that existed before the COVID-19 crisis. For example, Alberta has the highest proportion of stay-at-home parents across Canada (Statistics Canada, 2018). Although Statistics Canada (2018) does not disaggregate this statistic by gender, this likely also means that Alberta has the highest proportion of stay-at-home mothers. Relative to men, this suggests that women with children likely had less hours to lose when businesses and schools/daycares started to close throughout the province in March 2020. This, in turn, may explain the smaller reductions in hours worked among women with children in the second wave of Alberta's pandemic compared to their male counterparts (i.e., they may have maxed out reductions in working hours). In other words, these results may simply reflect pre-pandemic gender inequality in Alberta's labour market.

Figure 8: Percent change in cumulative labour market hours lost compared to 2019 by gender and presence/age of youngest child

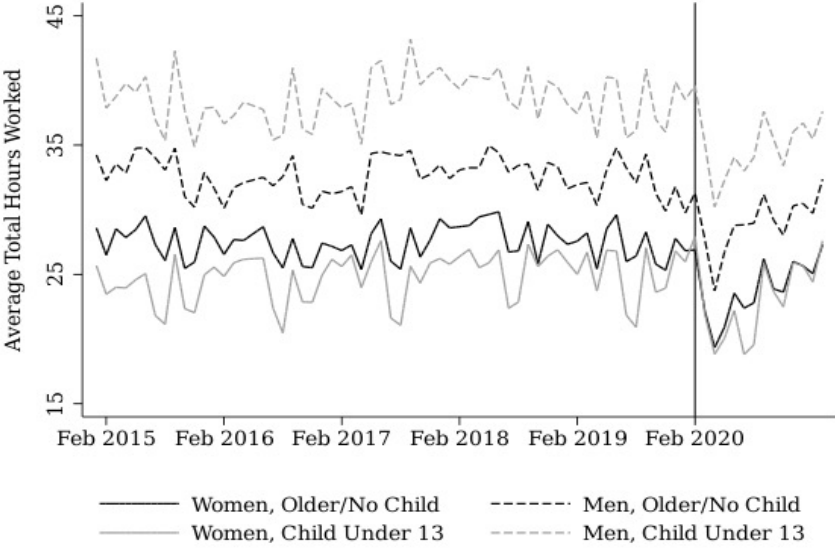


Notes: Figure 8 displays the per cent change in cumulative labour market hours lost over the course of the pandemic relative to 2019 by gender and presence/age of youngest child. We separately examine the following four sub-samples: i) women whose youngest child is under the age of 13; ii) women whose youngest child is 13 years of age or older or who have no child at all; iii) men whose youngest child is under the age of 13; and iv) men whose youngest child is 13 years of age or older or who have no child at all. Sample excludes: i) unpaid family workers; ii) respondents who have never worked; and iii) respondents who are not employed and who last worked more than a year ago.

Source: Canadian Labour Force Survey, public-use microdata files, 2019-2020. Tabulations by authors.

In Figure 9, we display the monthly historical trends in average hours worked between 2015 and 2020 by gender and parent status. It is clear that, before the pandemic, men with young children consistently worked the highest average weekly hours. In contrast, women with young children tended to work about 10-15 hours less than men with young children. The large gap between these two groups suggests that the division of household labour is still heavily placed on women. Importantly, Figure 9 further confirms that part of the reason we are observing large negative impacts on the hours worked of men with young children may be because they had more to lose in the first place. This general pattern is robust to a related analysis by the age of the youngest child (i.e., youngest child aged 0-5 and youngest child aged 6-12). However, we find the effect of the pandemic has been more severe for those with very young children.

Figure 9: Trends in average hours worked by gender and presence/age of youngest child, 2015-2020



Notes: Figure 9 displays the trends in average hours worked by gender and presence/age of youngest child. The sample includes all LFS respondents (i.e., employed at work, employed absent from work, unemployed and not in the labour force). We separately examine the following four sub-samples: i) women whose youngest child is under the age of 13; ii) women whose youngest child is 13 years of age or older or who have no child at all; iii) men whose youngest child is under the age of 13; and iv) men whose youngest child is 13 years of age or older or who have no child at all. Sample excludes: i) unpaid family workers; ii) respondents who have never worked; and iii) respondents who are not employed and who last worked more than a year ago.

Source: Canadian Labour Force Survey, public-use microdata files, 2015-2020. Tabulations by authors.

CONCLUDING REMARKS

In this paper, we examined various labour force statistics to understand the impact of the COVID-19 pandemic across different sociodemographic groups in Alberta. We show that initial large differences in labour market outcomes between men and women dissipated over the summer and fall months and that there is no evidence of an ongoing ‘she-cession’ in Alberta’s second wave. Our most striking result is significantly large differences in employment and actual hours worked between parents and non-parents—*irrespective of*

gender. These findings suggest that pandemic recovery plans which disproportionately focus on gender may be insufficient for addressing the complex labour market dynamics experienced by different groups throughout the pandemic. Rather than focus exclusively on gender, we propose that policymakers target policies towards both mothers *and* fathers with young children.

We must emphasize that the analysis conducted in this study describes the *short-run* effect of the COVID-19 pandemic on Alberta's labour market. For example, we are unable to determine the extent to which the large cumulative reductions in hours worked that we document in Figure 7 will impact long-run outcomes for parents—and mothers especially. When the province is eventually able to return to normalcy, there will likely still be lingering effects from the pandemic on the labour market outcomes of the various socio-demographic groups examined in this article. Moreover, it is important to note that, even though we show that employment has converged between men and women, because the latter group faced a larger decline in employment early on in the pandemic, in the longer run, women may experience more labour market frictions due to missed on-the-job training and other work experience opportunities—a concept known as *scarring*.¹³ As such, future research must examine whether the pandemic produced differential long-run effects on labour market outcomes for the groups studied in this paper. Such research will also better serve a discussion of long-run policy implications that are beyond the scope of our study and likely help to address labour market differences that existed between men and women before the COVID-19 pandemic.

Further, we also note that, in this chapter, we present estimates of the impact of the COVID-19 pandemic on the Alberta labour market, and we are not analyzing or commenting on the pre-pandemic status quo. Given substantial pre-pandemic labour market differences between men and women with and without children (see Figure 9), it is worth considering whether the status quo is acceptable and what policy options may help facilitate greater female labour force participation. This is not within the scope of our paper, but we raise it as an important consideration for future research.

We end on a hopeful note. Our paper provides preliminary evidence that Alberta fathers may have taken on a greater share of childcare and other household responsibilities during the pandemic. This is consistent with a report from the UK, which provides descriptive evidence that fathers spent more time providing childcare and performing other unpaid household work than they did before the pandemic (Chung et al. 2020). Using a sample of Canadian parents, Shafer et al. (2020) similarly find that fathers increased their participation in housework and childcare during the COVID-19 shutdowns. Finally, in the U.S., Alon et al. (2020) have also documented this change, and further note that, in effect, the pandemic may erode traditional social norms that propagate the uneven distribution of labour in the household.

Together, these studies suggest that the pandemic may generate long-run benefits for both women and men. Women may see reduced household responsibilities if men continue to take on a greater share of parenting duties. In contrast, many men are now recognizing the benefits of spending more time with their children (Lamont 2021). These changes may be everlasting if the pandemic has made firms more willing to provide flexible work

¹³ These long-run benefits and costs are further described in Stevenson (2020) and Alon et al. (2020).

arrangements in terms of both when and where work is completed. Indeed, if these trends continue, there may be greater improvements in the future labour market participation of women with young children who disproportionately shouldered the burden of home production well before the COVID-19 era.

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CHAPTER 6

**THE RATE OF
POVERTY AND
ALBERTA'S
ECONOMIC FUTURE**

Ron Kneebone and Margarita Wilkins

INTRODUCTION

The economy of the province of Alberta is seemingly entering a period of transition away from a high growth, high employment economy heavily reliant on the development of fossil fuel resources. This transition is being driven by low and uncertain fossil fuel prices, problems in building pipeline capacity to ship fossil fuels to market, and a growing consensus of the need to respond to climate change by reducing reliance on carbon-emitting fuels. What this transition means for income and employment growth in the long-term is uncertain but the experience in the short-term has seen much lower rates of increase in aggregate measures of income and employment. These developments have had important impacts on both government revenues and household incomes.

It is well-established that high income and high levels of employment offer solutions to poverty and the social ills that accompany it. Higher incomes boost purchasing power so that people can better meet their needs. They also involve multiplier effects that sustain further growth and generate revenues for governments to provide the infrastructure necessary to sustain growth over the long-term. International organizations such as the OECD (Organization for Economic Co-operation and Development), WTO (World Trade Organization), and the World Bank measure a nation's development by its real income per capita and emphasize higher levels as being the reason for dramatic declines in international rates of deep poverty. Within advanced economies, like Canada, differences in real per capita incomes justify policies that redistribute income between regions and regional economic development programs to increase incomes where they are relatively low. In short, higher income is a goal universally pursued by policymakers in part because of what it means for improving the lives of individuals and households whose incomes are at the low end of the income distribution. A corollary of this consensus view is that individuals and households with low income are possibly vulnerable to a transition to a lower growth, lower income economy.

To be sure, high aggregate income is never solely the source of poverty reduction. A higher level of aggregate income is not necessarily akin to an incoming tide that raises all boats; it does not always directly benefit everyone in society. Recognition of this is the reason why governments have put in place policies designed to redistribute increases in aggregate income. Any assessment of the possible long-term impact of lower income and employment on vulnerable populations must therefore also assess the potential for public policy measures to continue to provide support for those with incomes at the low end of the income distribution.

In this paper, we focus attention on understanding what the transition away from an energy-based economy might mean for individuals and families with low incomes in Alberta. Our approach is to describe how the rate of poverty — defined as the percentage of the population with incomes below the poverty line — has historically changed with changes in income and employment. We also describe how the rate of poverty has changed when governments have introduced public policies aimed directly at poverty reduction. In this way we show the extent to which people living with low incomes have shared in the benefits of aggregate income and employment

growth and the extent to which poverty reduction has relied on public policies. We use these measures to comment on what it may mean for individuals and families with low incomes to transition to an economy with lower levels of income and employment and lower levels of tax revenue available to provide income and other supports.

In the next section we define variables measuring poverty, income, employment and public policies aimed at poverty reduction. For each variable we compare how values have changed over time relative to the rate of poverty. We then empirically estimate a simple model of how the rate of poverty has responded when all variables change simultaneously. We use these estimates to consider scenarios describing how the rate of poverty might have evolved had income, employment, and public policy choices been different from what was observed. We conclude by using these results to comment on the possible implications for the rate of poverty of Alberta transitioning to an economy that may be characterized by lower aggregate incomes and rates of employment.

INCOME, EMPLOYMENT, PUBLIC POLICIES, AND RATES OF POVERTY

MEASURING POVERTY

The number of households living in poverty is measured based on a definition of a poverty line. A poverty line defines an income below which someone is deemed to have insufficient income to satisfy certain basic needs. There are data on three measures of poverty available in Canada. Until very recently, none has been identified as an “official” poverty line.

In this study, we use the Low-Income Cut-Off (LICO) measure of poverty. We make this choice in part because data on this measure is available since 1976, making possible a time series analysis over a long time period. Our choice is also guided by the fact the LICO measures poverty in a way that the federal government recently identified as appropriate when it chose to adopt the Market Basket Measure (MBM) as its official poverty line. Both the LICO and the MBM establish a poverty line defined as a level of income deemed to be sufficient for an individual or family to be able to meet basic needs. Because that list of basic needs is held more or less constant over time, both MBM and LICO are referred to as absolute measures of poverty. A drawback with using the MBM to determine the rate of poverty is that it has a relatively short history with data available only since 2002. For this reason, and because like the MBM it is a measure of absolute poverty, we make use of the Low-Income Cut-Off (LICO).¹

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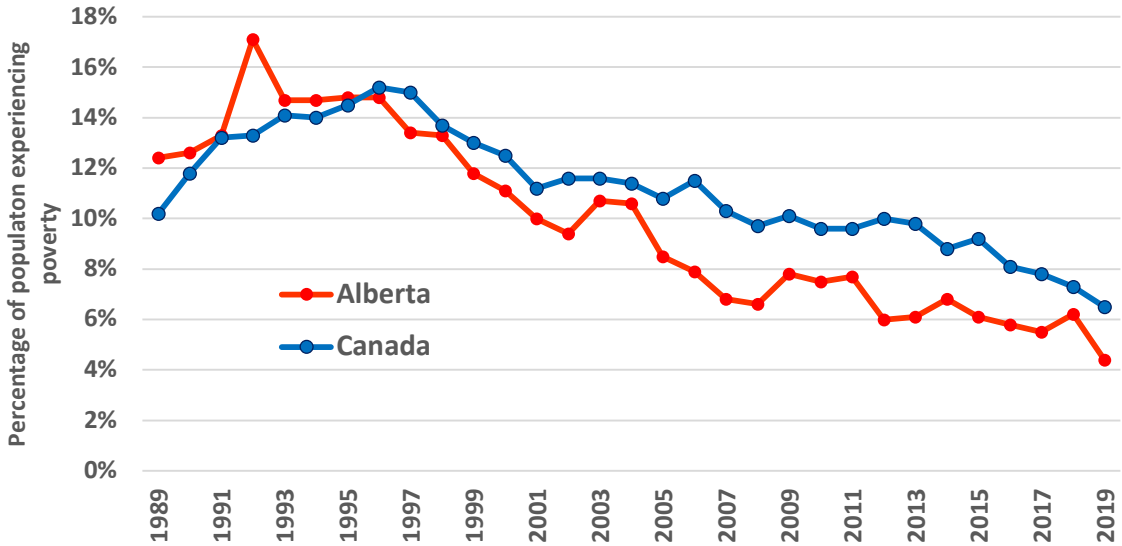
Using data on the third available measure of poverty, the Low-Income Measure, would also permit a long time series. The LIM is a *relative* measure of poverty. The LIM defines someone as experiencing poverty when their income falls a certain distance below the median income. Thus, when using the LIM, as part of the list of basic needs that income must be sufficient to satisfy is the need to maintain a certain level of social inclusion gained by being able to afford goods widely available to other citizens. When measured using the LIM, the rate of poverty may increase even though the real incomes of all households have increased. The LIM therefore defines a poverty line, and hence the poverty rate, in a way much different from the MBM or the LICO. Provinces frequently, though not necessarily consistently, use the Low-Income Measure (LIM) to evaluate policy progress. See Noël (2017) for discussion of the implications of provincial policymakers choosing to evaluate their policies using the LIM rather than absolute measures of poverty.

The LICO is based on a calculation of what the average family spends on necessities. The LICO threshold is defined as the income below which a family is likely to spend 20 percentage points more of its income on necessities than the average family. In 1992, when the base of the LICO was set, the average household spent 43% of its after-tax income on necessities. Thus, the LICO defines a family as being in “straightened circumstances” if that family is required to spend 63% or more of after-tax income on food, shelter and clothing. The LICO is measured for different family sizes and for different sized communities. Using these measures, Statistics Canada produces an estimate, for each province, of the percentage of the population with incomes below the LICO. We use this measure as our measure of the poverty rate.²

Our focus is on poverty in Alberta and how it has changed over the period 1989-2019.³ Specifically, our goal is to describe how the percentage of Albertans living with incomes below the LICO responds to changes in economic conditions and changes in government policy choices aimed at poverty reduction. The measure of the LICO we use is an after-tax, after-transfer measure that incorporates the effect of policy initiatives.

While our focus is on Alberta, it is useful to show how Alberta compares to the rest of the country. Figure 1 plots data on the percentage of households in Alberta and in Canada with incomes below the LICO. The graph shows that poverty rates have fallen a great deal since the 1990s. Starting in 1996 when it had a rate of poverty equal to that in Canada as a whole, the rate of poverty in Alberta has fallen faster and by a larger amount. This was particularly so in the period from 2004 to 2012 when the poverty rate fell by 4.6 percentage points in Alberta but by only 1.4 percentage points in all of Canada.

Figure 1: Poverty Rates in Alberta and Canada



Sources: Poverty rates, based on the after-tax LICO, from Statistics Canada Table 11-10-0135-01.

² Statistics Canada suggests that the LICO is not intended as a measure of poverty but, rather, defines it as a measure of income that leaves one in “straightened circumstances.” The LICO is nonetheless regularly described and used as a measure of poverty. In what follows, nothing is lost should we refer to a “straightened circumstances rate” rather than a poverty rate.

³ Our measure of income support, which is discussed below, limits the starting data of our analysis to 1989.

The literature on the causes of movements in aggregate rates of poverty often relies on cross-section comparisons across countries. This is because policies and labour markets are seen to differ substantially across countries, and it is that variability that researchers hope to exploit as a way of identifying why rates of poverty differ. These studies identify influences on rates of poverty stemming from demographic variables (such as race, immigration status, sex of head of household, and age distribution), changing education levels, changing labour market opportunities and changes to government income support policies. While demographic and education rates are sometimes shown to play a minor role, it is changes in labour market opportunities and government income support programs that are most frequently found to play the key roles.⁴

In this paper we take a time series approach and so rely on variation in the values of variables over time in a single jurisdiction.⁵ As they are relatively slow to change over time, we do not emphasize the role of changes to demographic variables and instead focus on the influence of labour market conditions and measures of government policies.⁶

REAL PER CAPITA GDP

In Figure 2 we plot the percentage of the population of Alberta experiencing poverty against real GDP per capita. A clear negative correlation is apparent; as real per capita GDP increases, the percentage of Albertans experiencing poverty falls. Marx et al (2015) note that income growth benefits the poor directly by creating employment (although not necessarily proportionally so) and by increasing the fiscal base for redistributive policies. The importance of the latter is due to the observation that should per capita income growth slow to such an extent to require government spending cuts, it is not unusual for policies that redistribute income to be a target for those cuts.⁷ We will return to this issue when we discuss the implications of our empirical results.

In the figure it is shown that periods of recession, when real GDP per capita falls, are often associated with increases in the rate of poverty. For example, the declines in real per capita GDP in the early 1990s and in 2009 are matched by increases in the rate of poverty. A notable exception, however, is the recession starting in 2014 when the rate of poverty nonetheless continued to fall suggesting other factors also contribute to explaining rates of poverty.

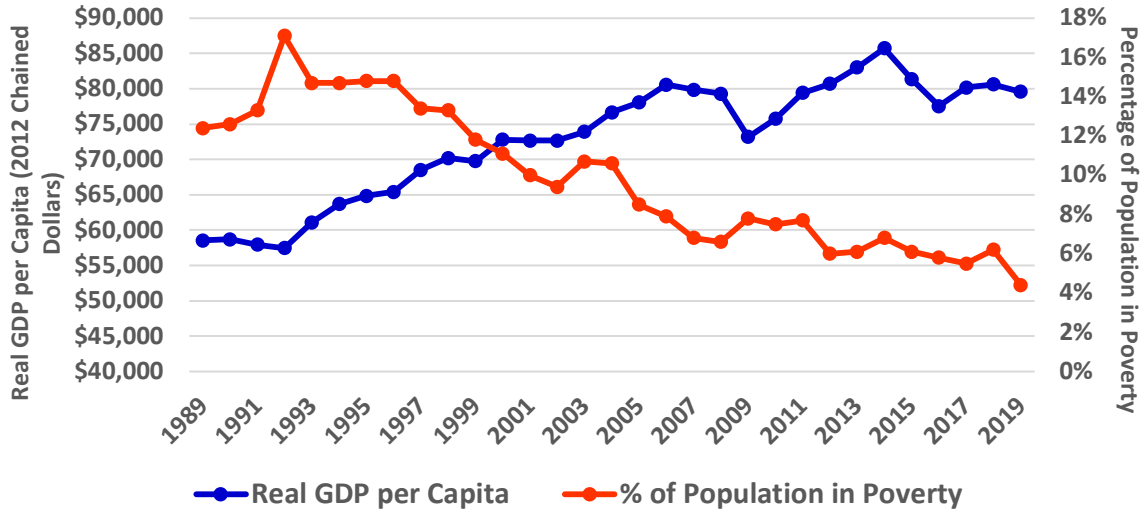
⁴ For an excellent review see Marx, Nolan, and Olivera (2015).

⁵ Thus, our approach is similar to that taken by Hoynes, Page, and Stevens (2016), and Chaudry et al (2016).

⁶ We are also constrained to be parsimonious in our model specification by the fact that data limitations restrict us to only 31 annual observations.

⁷ See Noël (2019) whose review of minimum income protection in OECD countries suggests that a general downward trend in income support is due to government fiscal difficulties. Governments with high and growing public debt are more likely to allow social assistance incomes to fall.

Figure 2: The Rate of Poverty and Real Per Capita GDP

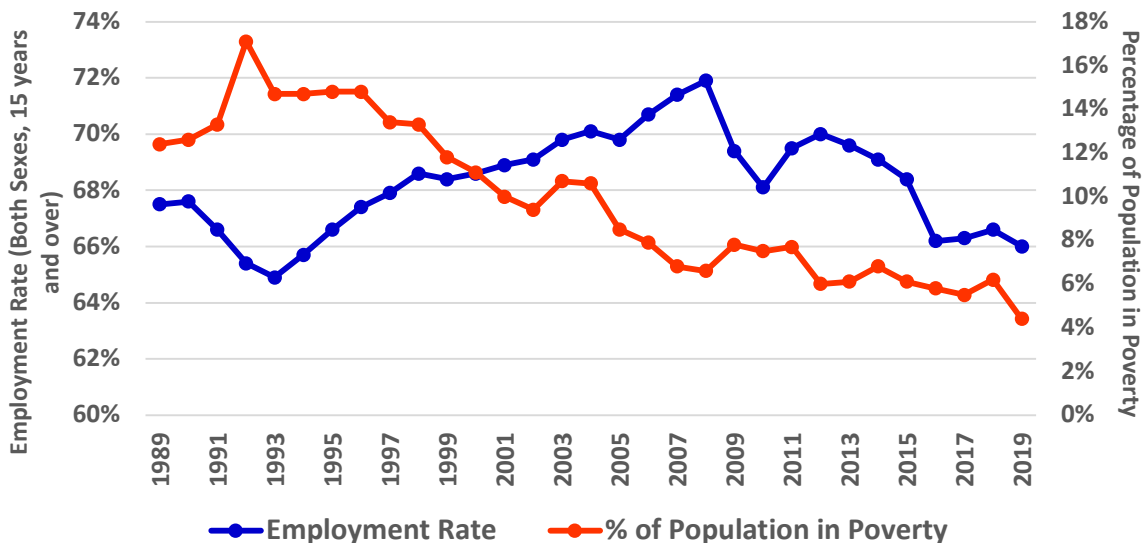


Sources: Real GDP from Statistics Canada Table 36-10-0222-01. Population data from Table 17-10-0005-01.

THE EMPLOYMENT RATE

The extent to which increases in income reduce poverty depends on the degree to which the poor participate in the growth process and share in its proceeds. This is an important consideration in Alberta because changes in Alberta’s GDP are often driven by changes in energy prices. While increasing the rents earned on energy assets, these changes in GDP may or may not translate into significant changes in levels of employment. However, it is employment and the rising income that accompanies it, that may most directly benefit households with low incomes and at risk of poverty.

Figure 3: The Rate of Poverty and the Employment Rate



Sources: Ratio of employed to total adult population from Statistics Canada Table 14-10-0327-01.

Figure 3 shows how the poverty rate in Alberta varies relative to the employment rate, defined as the percentage of adults aged 15 years and over who are employed. The downturn in employment in the early 1990s is associated with an increase in the poverty rate and the long period of steady increase in the rate of employment from 1993 to 2008 is associated with a large decrease in the rate of poverty. Since 2008, however, the poverty rate has continued to fall despite a generally falling employment rate.

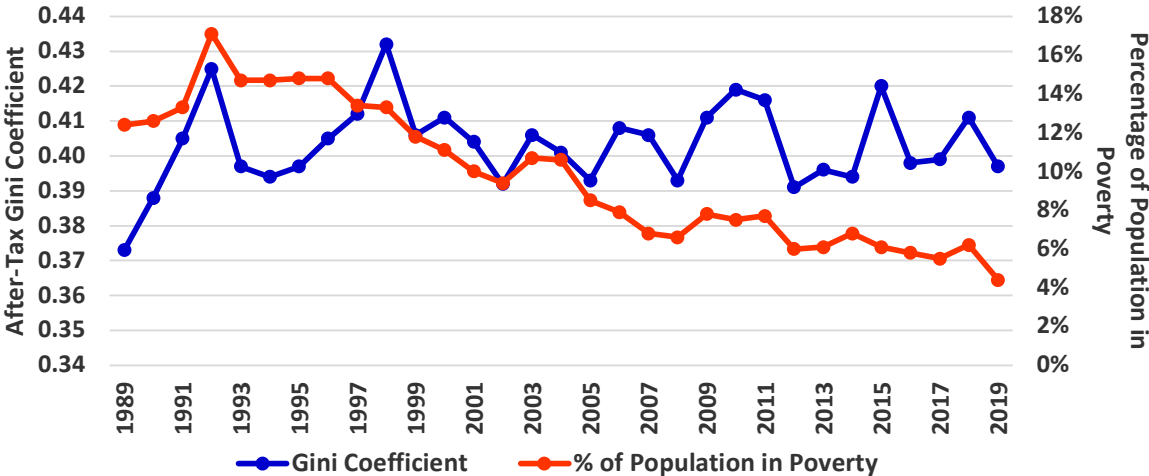
INEQUALITY

Even if the economy experiences zero aggregate income and employment growth, changes in the distribution of income can affect rates of poverty. If, for example, the distribution of earned incomes changes such that high incomes increase faster than low incomes, earned income inequality increases. If, in addition, earned incomes at the low-end of the distribution do not increase sufficiently to keep up with the cost of living, rates of absolute poverty will also increase. In this way, increased income inequality may be observed along with an increase in the rate of absolute poverty. This depends, however, on whether earned incomes at the low end of the income distribution grow sufficiently to keep up with the cost of living. If they do, then increased earned income inequality may be observed at the same time as a decreased rate of absolute poverty.

Government income transfers have a role to play in determining the relative movements of income inequality and the rate of poverty when the latter is measured after the receipt of redistributive income transfers. If earned incomes, together with income transfers, grow sufficiently to prevent real after-tax income losses at the low end of the income distribution, then even if earned income inequality were to grow, rates of poverty may increase, decrease, or not change.

To consider the possible role of changing earned income inequality of the poverty rate, we use the earned income (before tax and transfer) Gini coefficient. The Gini coefficient is a summary measure of income inequality. Its possible values range from zero to one with higher values indicating greater income inequality in earned incomes.

Figure 4: The Rate of Poverty and Earned Income Inequality



Sources: Earned income Gini coefficient from Statistics Canada Table 11-10-0134-01.

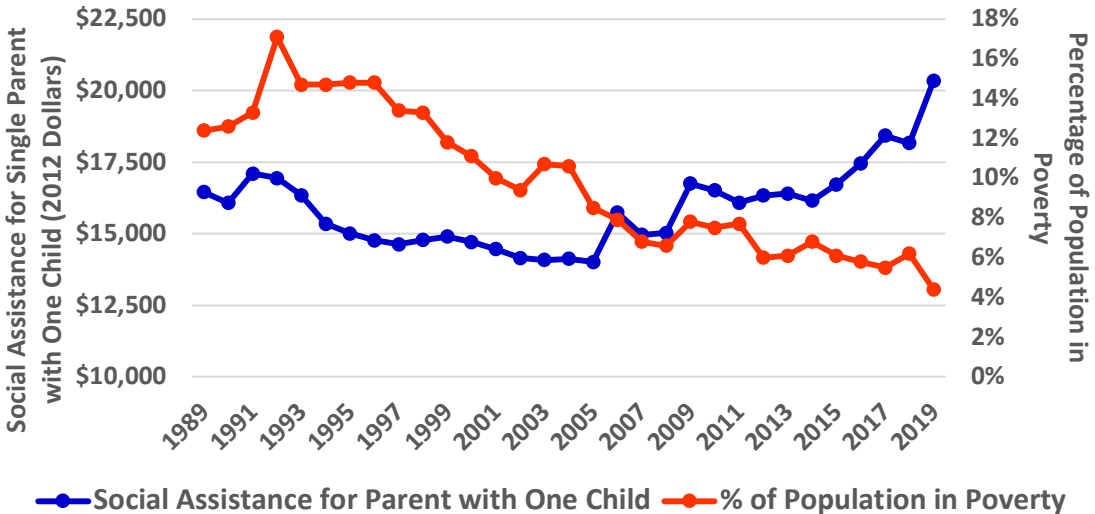
Figure 4 relates the rate of poverty measured after taxes and transfers to the measure of earned income (before taxes and transfers) inequality measured by the Gini coefficient. It shows that following a period of volatility during the 1990s, earned income inequality remained more or less constant suggesting all income classes shared in the growth in aggregate income after 2000.⁸ The relative movements in these variables suggest that changes in earned income inequality have not played a pivotal role influencing the rate of poverty.

POVERTY REDUCTION POLICIES

The state of the economy affects the rate of poverty by raising incomes and providing employment. Public policies may also affect the rate of absolute poverty through their use of taxation and income transfer programs to redirect incomes from high to low-income households.

In Figure 5 we show how the poverty rate in Alberta has varied relative to a measure of the size of the real value of income support provided in Alberta. Our measure of income support is defined as the real income provided by the federal and provincial governments to a lone parent with one child. We choose this measure to capture the influence on the poverty rate of what has been a concerted effort by both the federal and the provincial governments to reduce child poverty by increasing the size of social assistance benefits made available to parents. We assume all benefits available to lone parents, including those made available as tax and carbon levy refunds, are claimed and received.

Figure 5: The Rate of Poverty and Social Assistance



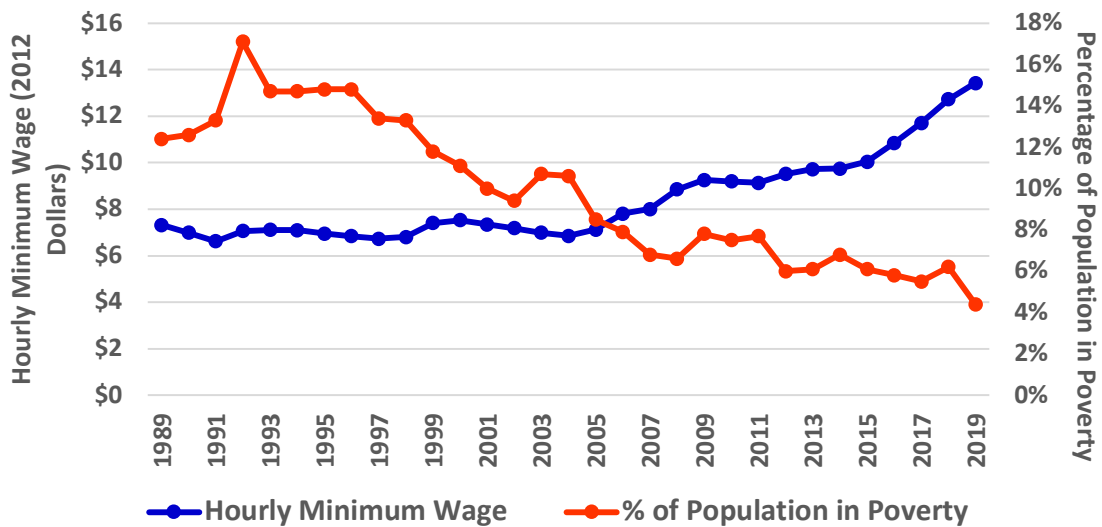
Sources: Income support provided to a lone parent with one child from Laidley and Aldridge (2020). <https://maytree.com/welfare-in-canada/alberta/>. Converted to 2012 dollars using Canadian CPI, all-items from Statistics Canada Table 18-10-0005-01.

⁸ For more evidence of this, see Wilkins and Kneebone (2018).

The commitment to increase child benefits that started in 2005 is apparent in the measure of social assistance income. While that dramatic increase in real income has been associated with a fall in the rate of poverty, it is noteworthy that prior to that year the rate of poverty was falling despite a gradual erosion of the real value of social assistance benefits.

An increase in the real value of the minimum wage is another way that governments can reduce rates of poverty among the so-called working poor, people who are employed but earn too little income to place them above the poverty line. Figure 6 shows the relationship between the after-tax LICO and the real value of the minimum wage paid in Alberta.

Figure 6: The Rate of Poverty and the Minimum Wage



Sources: Minimum wage data from Minimum Wage Database, Government of Canada (<http://srv116.services.gc.ca/dimt-wid/sm-mw/menu.aspx?GoCTemplateCulture=en-CA>). Annual value is the weighted average (by month) of values before and after legislated changes made during the year. Real values calculated using all-items CPI for Canada.

We again see that a rising minimum wage is associated with a fall in the poverty rate though this is apparently only after 2005. Prior to that time, the real value of the minimum wage was constant even while the poverty rate fell.⁹

IS IT THE ECONOMY OR IS IT PUBLIC POLICY?

Our presentations of the data and discussion of relative movements in these data suggest the need to identify their independent associations with the rate of poverty. For this purpose, we employ regression analysis. Table 1 presents summary information on the data discussed in the previous section and which will be used in our regression analysis.

⁹

It is noteworthy that both the minimum wage and the level of income support increased starting in 2005. It is sometimes claimed that governments seek to maintain a connection between the income available to the working poor (via the minimum wage) and the income made available to those unable to find employment and reliant on social assistance. The evidence in Figures 4 and 5 would seem to lend credence to that claim. In any event, these movements identify a level of collinearity in these variables that we will comment on below.

Table 1: Summary Statistics

	Employment Rate	Real GDP per capita, annual	% of population experiencing poverty	Real Minimum Hourly Wage	Earned income Gini Coefficient	Real social assistance income, annual
Mean	68.3	72,897	9.8	8.39	0.403	15,905
Median	68.4	73,902	9.4	7.40	0.404	16,079
Maximum	71.9	85,716	17.1	13.42	0.432	20,344
Minimum	64.9	57,443	4.4	6.61	0.373	14,019
Std. Dev.	1.8	8,308	3.5	1.85	0.012	1,455

Annual data, 1989-2019. N= 31. Monetary values are measured in 2012 dollars. The percentage of the population experiencing poverty is measured using the after-tax LICO.

Table 2 presents the results of regressions of the rate of poverty – the percentage of Alberta’s population living in households with incomes below the LICO – against the natural logarithms of real GDP per capita, the employment rate, the earned income Gini coefficient, a measure of the real value of social assistance income, and the real value of the minimum hourly wage. Dividing regression coefficients by 100 provides a measure of the number of percentage points by which the poverty rate changes for each one percent change in an independent variable.

Table 2: Effects of Economic Growth, Inequality, and Public Policy on Poverty

	(1)	(2)	(3)
Constant	608.48 (52.84)*	324.54 (27.99)*	467.59 (90.05)*
Ln(GDP per capita)	-20.64 (2.09)*	-7.54 (3.38)**	-12.87 (4.57)*
Ln(Employment Ratio)	-38.69 (10.94)*	-45.58 (11.43)*	-45.56 (11.06)*
Ln(Gini Coefficient)	19.08 (5.80)*	13.87 (5.83)**	15.93 (5.78)*
Ln(Social Assistance)	-19.33 (2.69)*		-9.60 (5.76)
Ln(Minimum Wage)		-12.02 (1.64)*	-6.72 (3.56)**
Adj R ²	0.93	0.93	0.94

Dependent variable is the percentage of the provincial population with incomes below the after-tax LICO. Standard errors are reported in parentheses. Asterisks denote significance at the 1% (*), 5% (**), and 10% (***) levels. Each model is estimated as OLS. N = 31. Annual data, 1989-2019. In each regression, Ljung-Box Q tests of the null hypothesis of independently distributed errors could not be rejected.

A comparison of the results reported in columns (1) and (2) shows that while the real minimum wage and real social assistance income have coefficients that are statistically different from zero when considered separately, their significance falls when they are both added to the analysis. This suggests what was noted earlier, namely, that collinearity between the minimum wage and the measure of social assistance makes it difficult to accurately measure the influence of each independently from the other.

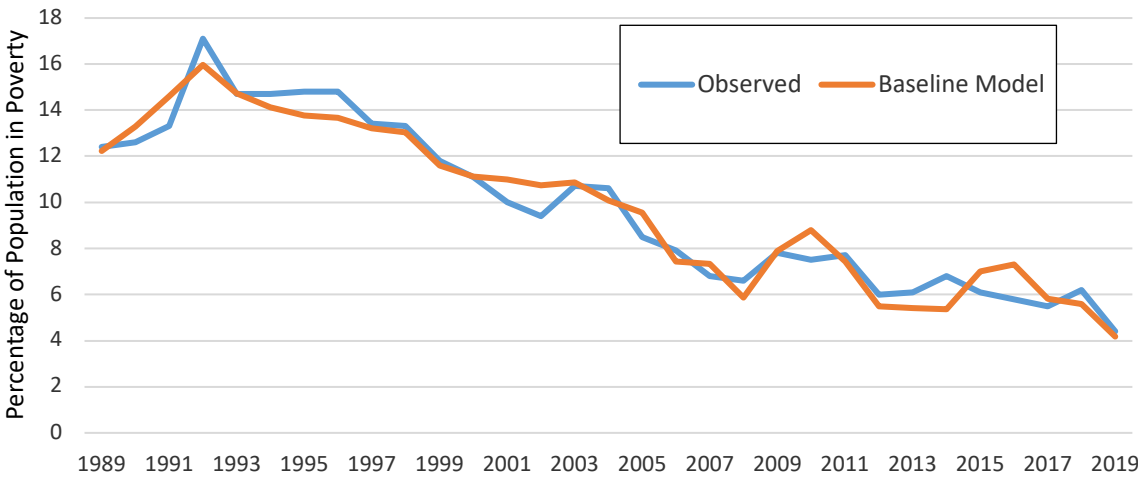
The coefficients reported in column (3) indicate that both economic conditions and public policy variables are associated with changes to the rate of poverty. Based on

the equation that includes all of the independent variables, each 1 per cent increase in real GDP per capita is associated with a 0.129 percentage point (or 1.31 per cent when evaluated at the mean value of the poverty rate) reduction in the poverty rate. Similarly, a 1 per cent increase in the employment rate is associated with a 0.456 percentage point decrease in the poverty rate (or 4.65 per cent when evaluated at the mean). Finally, an increase of 1 per cent in earned income inequality is associated with an increase in the rate of poverty by 0.159 percentage points (or 1.64 per cent when evaluated at the mean).

The two policy variables also appear to influence the rate of poverty. A 1 per cent increase in real social assistance income is associated with a 0.096 reduction in the poverty rate (or 0.98 per cent when evaluated at the mean) while a 1 per cent increase in the real value of the minimum wage is associated with a 0.067 percentage point reduction in the poverty rate (or 0.68 per cent when evaluated at the mean).

Figure 7 uses the results reported in column (3) in Table 2 to produce a baseline prediction of the poverty rate and compares that baseline to observed data on the poverty rate. As suggested by the high value of the R² statistic, the model generates values of the poverty rate that closely match the observed values.

Figure 7: Percentage of Population in Poverty, Baseline Model vs Actual



Source: Authors’ calculations.

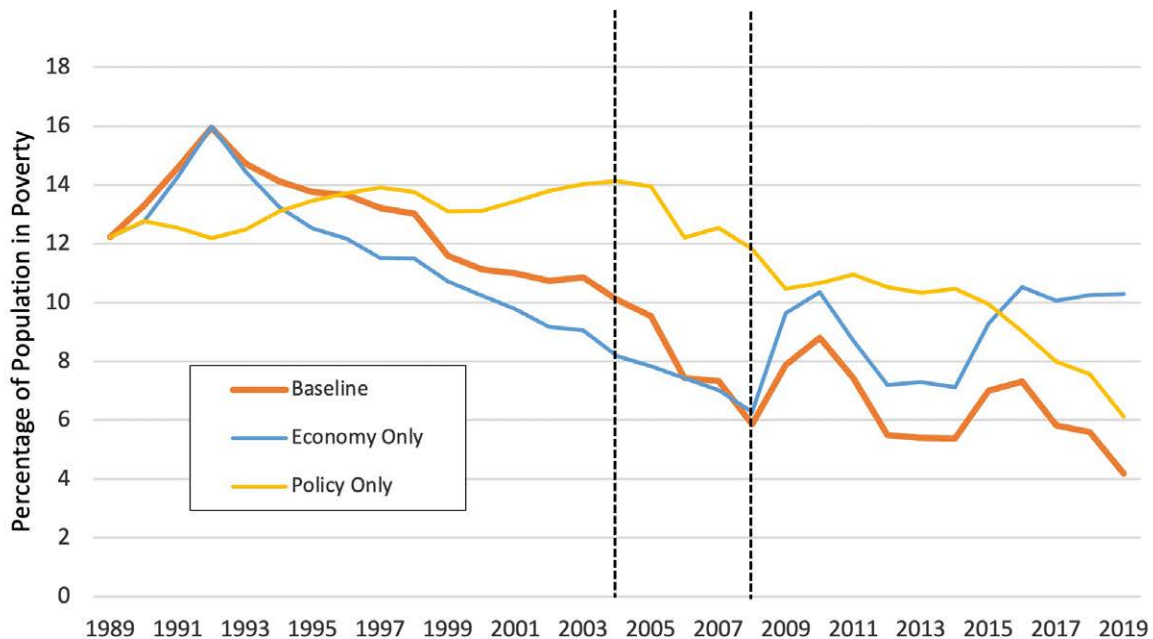
SCENARIOS

To better understand the implications of these statistical results, we use the estimated relationship reported in column (3) of Table 2 to consider alternative scenarios for the exogenous variables.

Figure 8 compares the baseline model against two alternatives. In the “Economy Only” scenario we hold the real values of the policy variables, the minimum wage and social assistance income, constant at their 1989 values. The result is a description of how the

rate of poverty would have evolved over the 1989-2019 period had no changes been made to the policy variables.¹⁰ In the “Policy Only” scenario we hold values of real GDP per capita, the employment rate, and the earned income Gini coefficient at their 1989 values. The result is a description of how the rate of poverty would have evolved over the period had no changes occurred in those three variables.¹¹

Figure 8: Two Scenarios, Three Periods



Source: Authors' calculations.

These two scenarios reveal three quite distinct periods of poverty reduction. During the period from 1989 to 2004, the change in the poverty rate was associated with strong income and employment growth and was realized despite minimal changes in policy variables.

For a short period from 2004 to 2008, both the economy and the policy variables were associated with reductions in the poverty rate. Changes in income, employment growth and changing earned income inequality explained 56 per cent of the fall in the poverty rate while the policy variables explained the remaining 44 per cent. With both policy actions and a strong economy working in unison, the poverty rate fell by 5 percentage points or 45 per cent in just four years.

After 2008, the economy in Alberta suffered the consequences of, first, the financial crisis in 2008-09, and then the fall in energy prices after 2014. The deteriorating

¹⁰ To be precise, we assume no change to the real values of the minimum wage and social assistance income. This would require policymakers changing nominal values just enough to offset the effects of changes in the price level.

¹¹ These exercises assume no behavioural responses resulting from holding the policy variables constant or holding employment and income growth constant. This is limiting as we might assume, for example, that increasing the minimum wage and increasing social assistance benefits could influence employment, hiring and labour supply responses and so influence employment growth.

state of the economy was pushing the poverty rate quickly upward. In our scenarios, increases in the two policy variables starting in 2014 were sufficient to offset these effects and so cause the poverty rate to fall. Over this period, the two policy variables were wholly responsible for the fall in the rate of poverty.

Over the entire 1989-2019 period, income growth, increases in the employment rate, and the effects of changes to earned income inequality accounted for 24 per cent of the fall in the poverty rate. The remaining 76 per cent was due to increases in the real value of the minimum wage and the real value of income support.

WHAT IT MEANS AND WHAT IT MAY MEAN FOR THE FUTURE

For advocates who suggest that higher real income and higher rates of employment are the form of medicine needed to cure the illness of high rates of poverty, our results are both encouraging and discouraging. They are encouraging in that the results are suggestive of the power of increases in income and employment to reduce poverty quickly and steadily without the need to finance new publicly funded anti-poverty programs. They can point to our results for evidence to support the notion that increases in the employment rate is an effective anti-poverty tool. However, this is a double-edged sword. Economic slowdowns can quickly undo these gains. In an economy like Alberta's where economic booms and busts are the norm, relying solely on the economy to address poverty means allowing for wide swings in the poverty rate. To avoid the costs of increases in poverty requires well-timed policy interventions.

For policy advocates, these findings are also both encouraging and discouraging. They can be encouraged by our results suggesting the power of public policy choices to reduce rates of poverty. Our scenarios suggest that had it not been for policy interventions after 2014, the downturn in the economy would have pushed the current rate of poverty in Alberta to be two and a half times what it is now. The results though, are also somewhat discouraging to policy advocates in that they show that public policies aimed at poverty reduction have limits to what they can do. As suggested by the data presented in Figures 5 and 6, it has taken dramatic increases in the real values of the minimum wage (an increase of 96% since 2014) and social assistance income (an increase of 44% since 2014) to obtain these policy-driven reductions in poverty. It may be unrealistic for advocates to suggest the possibility of still more increases in the real value of the minimum wage and still more increases in the real level of income support. This is so not only because of the need to maintain incentives for individuals to find employment¹², but also because of the expense that further increases in social assistance and minimum wages will impose on already-strapped public finances and the capacity of many businesses to absorb these costs.

If no further increases in the real values of minimum wages and income support seem likely, policy-induced reductions in the rate of poverty may also be unlikely and Alberta

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Marx et al. (2015) emphasize that increasing income transfers run the risk of worsening poverty and unemployment "traps" that undermine the bases for social solidarity and political support of relatively generous provisions.

will need to rely, more than ever before, on income and employment growth to keep rates of poverty low. If the transition to a new economic future, one less reliant on the energy production as the powerful engine of wealth creation, is long and characterized by slow rates of growth and falling employment rates, Alberta may also need to become accustomed to a rising rate of poverty.

CONCLUSION

There is undoubtedly a lot of uncertainty surrounding Alberta's economic future. As it always does, uncertainty weighs most heavily on individuals and families with limited incomes and savings and insecure employment prospects. This paper focuses on what Alberta's economic and fiscal future might mean for individuals and families living in poverty.

We have shown how the percentage of Albertans experiencing poverty varies with changes to income and employment and changes to policy variables designed to address poverty. Our results suggest that both approaches to attacking poverty are effective but both have their limitations. In a boom-and-bust economy, relying solely on economic growth to reduce poverty means that rates of poverty will mirror those booms and busts and so create havoc for people living with limited means. In the past 10 years concerted efforts to increase the real value of social assistance payments and minimum wages have successfully contributed to poverty reduction but it is possible that the ammunition for that fight has been largely exhausted. If that is so, then keeping the poverty rate low will in the future require a focus on encouraging income and employment growth.

Our focus has been on associating changes in the rate of poverty to changes in economic conditions and public policy choices. But it is important to recognize that changes in the rate of poverty are in turn associated with many other social ills. Rates of homelessness, family violence, and poor health are just a few examples. If the Alberta economy transitions to what may be one characterized by lower real incomes, lower employment rates, and a smaller capacity for governments and employers to absorb the costs of income support programs, then all these conditions may worsen. This suggests that the costs of transitioning Alberta's economy toward a different future may be borne most heavily by individuals and families least able to navigate this transition.

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CHAPTER 7

**ALBERTA'S FUTURE:
THE ROLE OF
ENTREPRENEURSHIP
AND INNOVATION**

Philip Cross

ALBERTA'S FUTURE: THE ROLE OF ENTREPRENEURSHIP AND INNOVATION

Alberta's economy experienced two interrelated shocks in 2020, as the pandemic sweeping the world also led to plummeting prices for crude oil and natural gas. Alberta has regularly experienced downturns in its oil and gas sector, although few with 2020's speed and severity. Furthermore, dealing with this shock was complicated by the pandemic closing large parts of the rest of the economy which usually help counterbalance losses in the oilpatch. The recovery of the oil and gas industry will be complicated by the price discount for Alberta's oil due to ongoing restrictions on market access—symbolized by the Biden administration's revocation of the Keystone XL pipeline permit on its first day in power—and renewed momentum for more stringent climate policies worldwide under the Biden regime. Meanwhile, Alberta's unprecedented budget deficits, due to falling royalty revenues and rising health care spending, limit the scope for government stimulus going forward. The unprecedented size of all these challenges will test Alberta's ability to adapt and innovate on a scale not seen in decades.

Fortunately, there are reasons to believe that Alberta has the latent potential to meet these daunting challenges. Several metrics suggest Albertans possess many of the cultural values that encourage innovation and entrepreneurship, the drivers of economic growth in the long-run. Above average rates of firm entry and exit speak to Alberta's cultivation of entrepreneurial values, including a willingness to assume the risk of starting new ventures and accepting the inevitable failures that accompany risk-taking. An openness to trade shows Alberta's willingness to foster competition and innovation rather than protecting incumbent firms, which manifests itself in a higher failure rate of firms (and not only in the volatile oil and gas industry). Alberta has the youngest provincial population in Canada, and youth is an advantage in creating a mindset that challenges existing beliefs. Alberta's highly cyclical economy means it constantly has had to adapt to new and changing circumstances, something its labour force does particularly well. This demonstrated ability to rebound from setbacks through innovation and entrepreneurship is one reason why, despite having the most volatile provincial GDP growth in Canada, Alberta has consistently posted the fastest growth over the long-term.

INNOVATION IS THE KEY DRIVER OF LONG-TERM GROWTH

Economic growth results from three variables; labour inputs, capital investments, and Total Factor Productivity (TFP). Labour inputs reflect total hours worked and the quality of human capital. Capital inputs reflects investments in assets made by firms and governments. Total Factor Productivity is the effect to which labour and capital inputs are used to make products judged useful by the marketplace. Many economists

call all TFP “innovation” and estimate it accounts for over half of all economic growth in the long-term. (Phelps, 2020, 34)¹

While measuring labour and capital inputs is relatively straightforward, TFP cannot be directly observed and therefore is the least understood component of growth. In the original formulation of the growth process, productivity came to be known as the “Solow residual,” encompassing everything that contributes to economic growth that is not accounted for by labour and capital inputs. (Gordon, 2016, 16) For decades economists followed Solow in assuming this residual was exogenous to the economy and therefore absolved them of the need or responsibility to try and understand its determinants. (Phelps, 2020, 32) Baumol summarized how economists treated innovation, investment and education “as exogenous products of happenstance, not as a predictable product of the free-market growth machine.” (Baumol, 2002, 26)

However, the idea that the largest source of economic growth was a mysterious Black Box impenetrable to economic analysis and understanding became untenable after decades of slow growth persisted since the 1970s.² Governments and economists increasingly demanded to know why the slowdown was occurring, why it was more pronounced in some regions (such as Europe and Japan) than in others (notably the US), and how it could be reversed.

Economists like Paul Romer and Edmund Phelps turned to endogenous explanations of variations in productivity growth. These dissident researchers speculated that the large ‘residual’ in economic growth calculations was not due to disembodied technical change, but instead was partly mismeasurement of the labour input. In particular, they adjusted labour inputs not just for increased quantity over time, but also improved quality as human capital rose. Soon similar adjustments were made for capital, disaggregated into capital widening and capital deepening. (Cross, 2016, 10) Romer specified in 1990 that GDP is related to the amount of knowledge discovered and a vector of production inputs of labour and capital. (Jones, 2005, 1066) The result was the concept of Total Factor Productivity (also called Multifactor Productivity). GDP growth now was a function of quality adjusted inputs of labour and capital and Total Factor Productivity growth.

The concept of Total Factor Productivity was revolutionary for both the theory and the measurement of economic growth. Instead of growth being a little-understood and exogenous residual, the “new models of endogenous growth questioned the neoclassical emphasis on capital accumulation as the main engine of growth, focusing instead on the Schumpeterian idea that growth is primarily driven by innovations that are themselves the result of profit-motivated research activities and create conflict

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Many other economists identify innovation with TFP. According to Robert Gordon, “Out best measure of the pace of innovation and technical progress is total factor productivity.” (Gordon, 2016, 2) As noted later when discussing TFP for Alberta, TFP may not capture innovation when new high-cost techniques were deployed to extract bitumen from the oilsands.

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The slowdown was briefly interrupted by the ICT revolution in the late 1990s, although as Phelps observed, it is hard to regard ICT as a revolutionary process when its impact was largely confined to the ICT industry itself. (Phelps, 2020, 81) A defining feature of a General Purpose Technology is it has “important impacts on many sectors of the economy.” (Gavin Wright quoted in Brynjolfsson and McAfee, 2014, 76)

between the old and the new by making old technologies obsolete.” (Aghion and Durlauf, 2005)

Economists and policymakers often assume all innovation is indigenous. However, an important source of innovation involves catching up to innovations already introduced in other countries, as Europe and Japan did after the Second World War when they replaced capital destroyed in the war with plant and equipment embedded with the latest technology. More recently, Phelps et al have pioneered disaggregating innovation between the part that originates indigenously within a country and the part that is imported from abroad.

WHAT IS INNOVATION?

Innovation “is a new method or new product that becomes a *new practice* somewhere in the world.” (Phelps, 2013, 20) Two types of innovation exist, differentiated by “knowledge of how to produce and knowledge about what to produce.” (Phelps, 2013, 8) The first is the ‘Smithian’ genre of producing more with less that boosts efficiency. Economists excel at studying this type of innovation because it can be measured statistically and analyzed mathematically. (McCloskey, 2010, 75) The second type is ‘Schumpeterian’ innovation which produces new goods and services. Schumpeterian innovation raises productivity by creating new goods and services that succeed in the marketplace, not lowering the cost of their production. (Mokyr 2016, 16)

Traditional economic theory sees productivity growth as the result of applying knowledge to existing tasks, and therefore productivity flows from inputs to knowledge such as education, research, or investment. The process of Schumpeterian innovation is driven more by culture and attitudes and requires entrepreneurship.³ Entrepreneurship and innovation are inextricably linked because entrepreneurship is the key to “doing something different rather than doing better what is already being done.” (Drucker, 1985, 130) Most importantly, entrepreneurs understand the key to innovation is value in the marketplace and not inventiveness or newness. As has often been noted, the genius of Steve Jobs at Apple was redesigning existing products to increase their appeal to consumers not inventing new ones. (Isaacson, 498)

WHERE DOES INNOVATION COME FROM?

Acknowledging innovation is the key to generating economic growth over the long-term, the question then becomes how a society can spur innovation. The narrow focus on Smithian efficiency preferred by economists was reinforced by the initial spurt of growth after the war that was fuelled by rapid population growth, two decades of pent-up demand, and Europe and Japan catching up to American technological innovations.

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While Schumpeter understood the concept and the importance of innovation, early on he mistakenly attributed all discoveries to scientists, leaving entrepreneurs the sole task of “the commercial applications that a discovery made possible” that involved raising capital, organizing the company, and developing the product. (Phelps, 2020, 2) This mechanical view of entrepreneurship meant it involved little risk, as “There is no chance of misjudgement, provided there is due diligence.” (Schumpeter, quoted in Phelps, 2013, 10)

This apparent ease of post-war growth encouraged a complacent and incomplete understanding of innovation by economists and policymakers. The limitations of this approach to innovation became evident after growth slowed markedly starting in the 1970s. The reflexive solution under the Smithian mentality was to emphasize the inputs into knowledge that would mechanistically boost innovation, notably R&D, patents, investment, science, and education.

Statisticians and economists initially identified innovation with Research and Development (R&D) carried out in businesses (almost inevitably only large firms could afford R&D departments), universities, and government laboratories. This remains the case for Canada where, in the words of the Council of Canadian Academies “the stubborn tendency to equate R&D and business innovation continues to inhibit a deeper understanding of innovation.” (2013, 25) The Canadian obsession with R&D continues to this day; both the Ontario and Quebec budgets tabled in 2021 increased funding for R&D.

After it became evident R&D was not enough to explain or boost innovation, researchers broadened their focus to the overall contribution of science. Again, the results were disappointing. Societies with high rates of innovation, such as the United States, invested relatively little in science: innovation in entertainment, fashion, and tourism “is remote from science” and hardly requires an R&D budget.⁴ (Phelps, 2013, 11) Meanwhile, countries such as the former Soviet Union excelled in science but that failed to translate into innovation. Emphasizing other knowledge inputs such as patents, investment, and education also did not stimulate or explain innovation. These results directly contradict claims that education and research and development are “the variables that economists have found to be important for growth.”⁵ (Mazzucato, 2013, 18)

The Holy Grail of innovation since the 1970s has been the search for the elusive combination of policies that would unleash it. Canada is an excellent example of a country with literally hundreds of programs designed to support innovation which have not paid off in the marketplace. As a result, Canada performs well on many metrics, notably spending on science, education, and government support of R&D. (Cross, 2020, 18) However, there has been little pay off in terms of higher TFP and innovation in Canada. Meanwhile, the United States performs poorly in many of these same areas, notably education, investing in science, and R&D, yet it leads the world in innovation. It has become increasingly clear that innovation does not result from policies but from cultural values that cultivate an entrepreneurial mindset.

⁴ American innovation is evident in these industries, as shown by the dominance of firms such as Disney, Netflix, Nike, and the Carnival Cruise Line.

⁵ Mazzucato later contradicts herself by calling the idea that R&D drives innovation a “myth” based on “false assumption leading to ineffective innovation policy,” citing company-level studies that find no clear evidence R&D has a positive impact on growth. (Mazzucato, 2013, 44)

INNOVATION AND CULTURAL VALUES

The traditional view that innovation can be influenced by government control and calibration of inputs is giving way to a broader view of the social and cultural context in which innovation thrives. The emphasis on the social and cultural determinants of innovation is a radical departure from the traditional approach of economists. Many mainstream economists resist the introduction of values into the study of innovation. Robert Solow, a pioneer of growth theory, dismissed attempts to explain economic growth with cultural values because it would end “in a blaze of amateur sociology.” (quoted in *The Economist*, 2020)

However, economists recently have injected substantial statistical rigour into studying how values affect innovation and economic growth. Phelps and his colleagues have done extensive econometric work on how the capacity of countries to innovate relates to different cultural values such as independence, self-expression, the willingness to compete, and taking the initiative. (Phelps et al, 2020, 12-13)

Cultural values are also revealed by how political leaders relate to the business community. For example, it is de rigueur for politicians of all stripes to support the high tech industry. However, as Drucker observed “A policy that promotes high tech and high tech alone—and otherwise is as hostile to entrepreneurship as France, West Germany, and even England are—will not even produce high tech. All it can come up with is another expensive flop, another supersonic *Concorde*; a little *gloire*, oceans of red ink, but neither jobs nor technological leadership.” (Drucker, 1985, 255) This is a particularly apt description of the self-defeating approach to innovation by many politicians in Canada today. Always anxious to attend a photo-op for fanciful ideas like the Quayside ‘smart city’ project in Toronto (with Google affiliate Sidewalk Labs) that often prove impractical, many of our leaders defame industries such as the oil sands and pipelines.⁶ Denigrating losers is the Janus face of picking winners in favoured industries such as high tech or green energy. Business leaders understand the hostility directed at one industry today can easily be redirected to their own tomorrow in the fickle world of politics. More broadly, the pattern of lavish federal transfers to households during the pandemic and parsimonious support for businesses sent a clear message about the low priority governments attach to much of the business community in Canada.

The importance of cultural values in fostering innovation suggests the very attempt to implement innovation policies can hinder actual innovation, which helps explain their failure in Canada and other countries. Innovation policies by definition dictate either the specific actions or the rewards for activities believed to be related to innovation. These include tax credits for R&D, more spending on education and science, and direct subsidies for industries believed to be hothouses of innovation (such as aerospace). However, these artificial rewards and incentives make true innovation redundant, which

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Prime Minister Trudeau forecast that the oil sands would be shut down some day, while Bloc Quebecois leader Yves-Francois Blanchet denounced Alberta’s “toxic oilsands,” Premier Francois Legault called oil “dirty energy” and the National Assembly unanimously passed a resolution that the Energy East pipeline was “not socially acceptable” in Quebec (Patriquin 2019).

ultimately requires success in the marketplace. Instead, firms and institutions such as universities are rewarded for following government specifications of desirable actions. This may help explain Statistics Canada's finding that firms receiving government funding produce fewer patents.⁷ The NBER found a similar result in the US, where "a 10 percent increase in the share of funding that comes from the federal government caused a 0.4 percentage point reduction in the probability of receiving any patents, about half of the average level." (NBER, 5) Firms would be better incentivized by so-called "small catastrophes" that necessitate innovation by threatening their very survival (such as Apple's near-death experience in the late 1990s) than by government support and subsidies.

BARRIERS TO INNOVATION

Recognizing the importance of innovation to economic growth does not ensure that it will be embraced by existing institutions. On the contrary, the creative destruction unleashed by innovation inevitably is resisted by established players profiting from the existing order. Creation and destruction are both fundamental to innovation. Every successful innovation destroys a part of some other business, either by directly taking away part of its clientele or indirectly siphoning off customer purchasing power. Because it disrupts, innovation foments resistance since "change hurts vested interests. It is not difficult to explain why change is generally opposed...Once an institution is in existence, it is very hard to change it or to get rid of it. Owing to its past growth and development, an empire is inevitably characterized by a large number of sclerotic institutions. They hinder change for their very existence." (Cipolla, 11)

As a result, entrenched interests are adept at using processes and institutions in a number of ways to thwart change and preserve the status quo. One is the creation of "meritocracies in which the key to personal success was the uncritical expertise in the existing body of knowledge inherited from the past." (Mokyr, 2016, 340). This may be one reason education is not closely correlated with innovation.

However, by far the institution used most to preserve established interests is government and its array of "regulations, grants, loans, guarantees, taxes, deductions, carve-outs, and patent extensions" that protect vested interests. (Phelps, 2013, 314) These erect barriers to the entry of new firms (such as Uber) or the introduction of new products and technologies (such as driverless vehicles, where the major roadblock is not technology but wrangling over legal liability). Governments also confer special advantages on favoured incumbents to create artificial scarcity and rents. (Lindsey and Teles, 13) Firms should be able to extract rents from the introduction of a new product or lower cost production process; the temporary reaping of above-average profits is a key motivation for innovation. However, firms should not be able to permanently garner rents because their position in the marketplace is protected by government regulation or fiat.

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Statcan said "In 2019, slightly more than one-tenth of enterprises that received private funding (10.4%) owned patents in Canada, while 8.2% of businesses that accessed public funds owned patents in Canada." (Statistics Canada, 2021a, 2)

Canada is expert at erecting barriers such as regulations, tariffs, and occupational licensing,⁸ showing it has little tolerance for the destructive aspect of creative destruction. While Canada touts its trade bona fides from belonging to numerous international trade agreements,⁹ these deals all include exemptions from foreign competition for large sectors, including banking, telecommunications, agriculture, and culture. Canada's track record on internal trade is even worse. A Statistics Canada study found that trade flowed within Canada as if a permanent 6.9 percent *ad valorem* tariff on trade existed within its borders; applying the same methodology to the US shows their internal trade moved as if there were no internal tariffs on trade. (Bemrose et al, 2017, 4)

INNOVATION IN CANADA IS LAGGING

The values most conducive to innovation include “trust, the willingness to take the initiative, the desire to achieve on the job, teaching children to be independent, and the acceptance of competition.” (Phelps, 2020, 105) Not surprisingly, “The country with the values most conducive to innovation is the US.” (Phelps, 2020, 116) By comparison, Canada fared poorly, especially its acceptance of competition and teaching children to be independent. (Phelps, 2020, 113)

As a result of the shortfall of the cultural values that encourage innovation and the erection of barriers to insulate incumbents from the need to innovate, Canada's track record on innovation has been abysmal. Canada has the second lowest increase in TFP in the G7 since 1970, behind only Italy. (Phelps, 2020, 42) Furthermore, two-thirds of the innovation taking place in our economy is imported. This implies homegrown innovation grew by an annual average of less than 0.1 percent from 1970 to 2012. (Phelps, 2020, 58) With indigenous innovation virtually drying up in Europe, Japan, and Canada in recent decades, “the US has been the global engine of innovation.” (Phelps, 2020, 64) Despite being situated next to the world's leader in innovation and constantly exposed to the cultural values which encourage American innovation, Canada has not learned how to innovate.

Policymaking in Canada continues to focus on inputs of knowledge and not cultural values in a futile attempt to improve its record on innovation. Canada excels at many of the presumed inputs into innovation, such as R&D, funding for science and universities, and generous government subsidies for innovation. None of this has paid off because Canadian society does not subscribe to enough of the values that incubate innovation, preferring instead to protect incumbent firms. The Canadian Council of Academies in its report on innovation concluded Canada needed more “small catastrophes” which

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Lindsey and Teles (95) point out that occupational licensing acts as a form of protectionism which restricts domestic rather than foreign supply and is especially effective at limiting competition in the services industries which often are not subject to foreign competition. It is notable that occupational licensing has risen proportionately to the decline of unionism in the private sector in recent decades.

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Not everyone agrees that trade pacts encourage innovation. Lindsey and Teles argue that trade agreements have had the effect of allowing “the United States to export its flawed IP model to countries around the world” especially for key sectors such as entertainment, information technology and pharmaceuticals. (Lindsey and Teles, 169)

would shake the existing establishment of firms and governments and give firms the experience and the need to make risk decisions when their survival is at stake. (2013, 29)

There are several measures of the dynamism of a country's capitalism. One important metric is the rate at which firms enter and exit the marketplace. Prescott and Ohanian (2014) identify firm entry and exit as useful measures of a society's taste for entrepreneurship. Firm entry reflects both whether there exists an entrepreneurial culture in which people want to start a business and government regulations that allow them to do so quickly and at low cost. Births and deaths of firms together are important because "change in the economy is driven more by the entry and exit of firms than by the adaptation of individual companies." (Beinhocker, 2006, 333) Statistics Canada agreed, noting "The entry of new firms is an important source of productivity growth and technology adoption while exit removes less productive firms." (Macdonald, 2014, 1) It is widely acknowledged that while small firms on average have lower productivity than large firms, they are also the vehicle through which disruptive change and innovation is most likely to occur. Mark Carney observed how "Disruptive innovations usually come from new entrants—such as Amazon in retail or Uber in transport." (Carney, 2021, 504) Partly this reflects that innovation is very difficult for large firms and nearly impossible for government bureaucracies.

Another measure of dynamism is the competition that incumbent firms face: are incumbents heavily-protected by government, or is competition from overseas firms or new homegrown businesses encouraged? As noted earlier, Canada provides extensive protection or subsidies for large sectors of its economy, mostly through regulations that limit the entry of foreign companies or impose import quotas, so these restrictions do not appear in simple tabulations of tariff barriers. The least protected industries are mostly exporters, who by definition must be able to weather competition in foreign marketplaces.

THE REAL ALBERTA ADVANTAGE: INNOVATION AND ENTREPRENEURSHIP

The low taxes enabled by high royalties from oil and gas, especially the absence of a provincial sales tax, have long been touted as the 'Alberta Advantage.' Low taxes directly impact the Smithian type of innovation—efficiency and low costs of production. Alberta has successfully pursued a diversification policy based on "making Alberta the most tax-competitive jurisdiction in Canada" that attracted financial services and many corporate head offices to Calgary. (Morton and McDonald, 1)

However, Alberta also has a number of advantages when it comes to the more important type of 'Schumpeterian' innovation, which depends on the drive and ability for change, a receptivity to change and upheaval, and enabling institutions. (Phelps, 2013, 20) These advantages are reflected in a number of ways explored in this section. Alberta's rate of firm entry and exit is higher than the rest of Canada. Its labour force has shown a capacity to shift to new industries after shocks to its energy sector. Alberta is the province most open to trade and deploys fewer regulations to protect incumbent firms, forcing businesses to innovate to survive and thrive. Alberta has a

young population with the highest education levels in Canada, and youths are better able to think in terms of new ideas and solutions.

Alberta consistently has had a higher rate of firm entry and exit than the rest of Canada. Between 2015 and 2020 new firms in Alberta started operations at a rate of 5.5 percent per year (calculated as a share of existing firms) compared with 4.9 percent in the rest of Canada (Table 1).¹⁰ Firm exits in Alberta averaged 5.7 percent versus 4.9 percent in the rest of Canada. Firm turnover in Alberta, especially exits, rose after the pronounced slowdown of its economy when the oil price boom ended in 2015. However, both the rate of births and deaths in Alberta remained consistently higher through 2019, long after the initial oil price shock began. Firm turnover in the rest of Canada is depressed by very low rates in Quebec, where entry and exit both averaged 4.0 percent. However, Alberta's turnover still compares favourably with entry rates of 5.2 percent in both Ontario and BC and exit rates of 5.1 percent in Ontario and 5.2 percent in BC.

Table 1: Firm entry and exit rates, Alberta and the Rest of Canada (as % of existing firms)

	Alberta		Rest of Canada		Quebec		Ont		BC	
	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit
2015	5.2	5.2	4.7	4.4	3.7	3.6	5.0	4.5	5.0	4.7
2016	5.5	5.8	4.8	4.7	3.9	3.8	5.1	4.9	5.1	5.0
2017	5.4	5.5	4.7	4.6	3.7	3.7	5.0	4.8	5.0	4.9
2018	5.6	5.7	4.9	4.9	4.0	4.0	5.2	5.1	5.2	5.1
2019	5.5	5.5	4.8	4.7	3.8	3.7	5.0	4.9	5.1	5.1
2020	6.0	6.5	5.7	6.0	4.9	5.1	6.0	6.5	5.9	6.1

Source: Statistics Canada Table 33-10-0270-01

Alberta's higher rate of firm turnover was on display again in 2020. While the pandemic raised both entry and exit rates more in the rest of Canada than in Alberta, the overall rates of births and deaths remained higher in Alberta. Alberta's high rate of new firm entrants in 2020 is consistent with its raising a record \$455 million in venture capital, double the amount in 2019.¹¹ It is notable that despite Alberta experiencing the twin shocks of low oil prices and the pandemic in 2020, its 1.0 percentage point increase in the exit rate was less than the 1.3 point rise in the rest of Canada.

The surge in exit rates in 2020 could continue to climb when the numerous government support programs wind down. While providing support for businesses adversely affected during the pandemic was appropriate, already evidence is surfacing that the firms most negatively affected were younger, had fewer employees, less assets, more debt, less liquidity, and lower profits. (Leung, 2) This implies firms that survive the twin

¹⁰ While Statistics Canada's latest data on firm entry and exit are only available from 2015, similar data for 2000 to 2009 also show "Alberta had the largest net entry rate over the period from 2000 to 2009." (Baldwin et al, 2013, 5)

¹¹ Calgary Herald. Alberta securities regulator adopts new measures aimed at helping tech sector, small businesses grow. April 2, 2021.

shocks of 2020 will be in a stronger financial position to take advantage of growth opportunities in the recovery. Alberta should resist the temptation to support firms that were less successful and not well-capitalized before the pandemic, instead allowing stronger firms to expand their share in the marketplace.

The higher exit rate for firms in Alberta, and its long experience with the ups and downs of resources such as oil and gas and farming, imply a greater acceptance of the failures that are an inevitable part of innovation and creative destruction. A high exit rate suggests Alberta has lower barriers to entry that protect the position of incumbent firms than in many parts of Canada. Alberta's higher entry rate for new firms also points to the greater presence of the entrepreneurial spirit that most researchers find necessary for innovation. Previous studies have linked high rates of firm entry in Alberta to a strong entrepreneurial drive "rooted in rural-conservative values characterized by rugged individualism, risk taking, entrepreneurial awareness, and an appreciation of adversity..." (Mansell and Percy, 57) Alberta's traditional orientation to export markets, which could not be protected by its government, encouraged a culture of self-reliance and adaptability. The entrepreneurial spirit also could reflect the large American influence in its business community and hence a greater presence of people with values associated with innovation (Calgary is home to 100,000 Americans living outside the US. The large number of American ex-patriots may also dampen the reflexive anti-Americanism many parts of Canada share, making Alberta more open to importing innovation). It is unclear whether the historical values that encouraged innovation and entrepreneurship in Alberta will be eroded by the influx of people from the rest of Canada and abroad and a population increasingly raised in an urban setting.

Creative destruction requires an ability to respond and adapt to the inevitable rapid change of conditions from the boom-bust cycle in Alberta's energy sectors. Past downturns show most workers in Alberta's oil and gas industry were able to transfer and adapt their skills to other industries. Statistics Canada's study of workers laid off in the oil and gas industry between 2005 and 2015 showed that 73 percent found a job within a year, and 80 percent of those jobs were in industries outside of oil and gas. (Chen and Morissette, 4) This testifies to both a willingness of workers to be open-minded in their search for new job opportunities and the ability to transfer their skills from oil and gas to other industries. Alberta's reliance on resources such as energy and agriculture encouraged its labour force to acquire multiple skill sets, which enhanced its adaptability.

Furthermore, most of Alberta's displaced oil and gas workers adapted well over time. Nearly half of workers displaced in the aftermath of the 2009 recession experienced an initial drop of at least 30 percent in earnings in the first year after layoff (especially older workers with long tenure, who do not transfer their specialized knowledge easily to new industries), while one out of four of displaced workers saw their earnings increase significantly after layoff. However, within three years of switching to a new industry after layoff, the median earnings of displaced workers were slightly above what they had earned in oil and gas. (Chen and Morissette, 6) The increase in earnings reflects how most displaced oil and gas workers shifted to high-paying industries, including construction (where 29 percent landed), high-skill services (18 percent), public administration (5 percent) and manufacturing (7 percent). Only 6 percent

ended up working in low-skill services. Shifting to industries with above-average wages may not always pay well initially, but it allows skilled and motivated workers the opportunity to advance over time, which fits the earning profile of Alberta's displaced oil and gas labourers.

Alberta is the province most open to trade within Canada (as a province, it has little control over international trade, one reason pipeline access to foreign markets has lagged). An IMF study found that Alberta had the least costly inter-provincial trade barriers of any province. (Alvarez et al, 2019, 13) Alberta's openness to trade is evident in its willingness to enter into agreements with neighboring provinces involving mutual recognition of provincial regulations related to trade, investment, labour, government procurement, and corporate registration. (Alvarez et al, 2019, 5) In 2006 it signed the Trade, Investment and Labour Mobility Agreement with British Columbia, whose success led to the West Partnership Trade Agreement joined by Saskatchewan in 2010 and Manitoba in 2017. The Canadian Federation of Independent Business ranks Alberta as having the fewest exceptions to the Canadian Free Trade Agreement that came into effect in 2017. (16) Trade improves economic growth by allowing specialisation and higher productivity. Trade also is important because it breaks the "dangers of capture of government by business" that allows firms to hide behind regulations that shelter them from competition and the need to innovate. (Carney, 30)

The Canadian Federation of Independent Business evaluates Alberta as having the second best regulatory regime in Canada (slightly behind Manitoba). Alberta is first in the sub-component measuring the lightest regulatory burden, and its government has committed to reducing the regulatory burden by one-third by 2023. Regulation is important to small businesses, who even in the middle of the pandemic ranked it as their second priority for government behind only low taxes. Alberta's grade has improved dramatically since 2019, when it placed last in Canada. (Canadian Federation of Independent Business, 3, 23, 35)

Alberta's ability to innovate is not fully captured in the aggregate statistics on TFP. Between 1997 (when data on provincial TFP begin) and 2018, TFP in Alberta fell by 17.5 percent. Some of this decline reflects factors unique to Alberta, including its oil boom in the decade before 2015 which resulted in shortages, spiraling costs, and lower productivity. The rapid growth of the oil sands required large amounts of labour and capital inputs compared with conventional oil deposits (capital inputs in Alberta's mining industry soared by 284 percent over this period, while labour inputs rose 63 percent). The greater need for more inputs to produce bitumen translates into lower TFP, even if designing the new techniques that allow oil sands extraction are an example of Schumpeterian innovation. The resulting decline in TFP in the construction and operation of mining operations accounted for all of Alberta's drop in total TFP. There are other measurement issues, since key technological innovations in the oil sands aimed at reducing greenhouse gas (GHG) emissions are not captured in the statistics on current production. However, such investments help assure a market for Alberta's oil and even higher prices for Alberta's bitumen in the future. In other words, investing in environmental innovation may result in higher costs and lower productivity today but generate higher measured productivity in the future.

The history of innovation in Alberta's oil sands provides a possible solution to one of the puzzles of innovation across Canada, which is bridging the "death valley" that exists between the start-up of new small firms and large commercially viable companies. A study by the IRPP concluded that Canadian firms "are less inclined to scale up and commercialize their new products and processes." (Gallini and Hollis 2019, 1) The oil sands have shown that the presence of several large, well-funded companies in an industry helps bridge this gap by undertaking risky investments in technology, notably the development of the in situ steam-assisted gravity drainage oil sands recovery technology.¹² As a result of the very large capital requirements needed for major innovations in oil and gas and access to a larger and deeper talent pool, "it is the large firms that drive innovation in the oil and gas sector." (Mansell et al, 2012, 2)

Government's role should not extend beyond encouraging the deployment of venture capital and business formation. Targeting small firms as the source of innovation, a dubious strategy for most industries, will not work in the oil and gas industry. One possible exception to government aid is supporting otherwise viable companies that need funding at the worst of a cyclical plunge in oil prices. Examples of government interventions that successfully provided funding to projects temporarily in need of aid include Syncrude during the 1974 crisis and Hibernia in 1986. It is notable, however, that recent price shocks have not resulted in emergency funding, partly a reflection of how large oil sands projects are well-capitalized to ride out short-term fluctuations in prices. This stability of oil sands operations is reflected in how employment in the extraction of oil and gas fell only 0.9 percent between February 2020 and December 2020, compared with a drop of 17 percent for drilling and exploration operations. (Statistics Canada, 2021b)

Outside of mining, most industries in Alberta posted TFP growth over the past two decades. Above average gains were recorded for retailing, professional, scientific and technical services, information and cultural and other services, while Alberta matched the TFP gains across Canada in natural resources (mostly agriculture and forestry), manufacturing, administrative services, and finance and real estate. The positive trend of TFP in Alberta became apparent when oil sands inputs slowed after 2009, with total TFP growth of 6.3 percent through 2018 ranking the third-highest in Canada (after BC and Ontario).¹³

The rapid growth of TFP in Alberta in recent years shows that innovation in the province does not require diversification from energy into other sectors such as high tech. Significant opportunities for innovation remain in the energy sector, including new sources such as hydrogen and renewables (where Alberta has a natural advantage in wind power). Moreover, the long-term viability of the oil sands likely depends on their ability to continue lowering their GHG emissions, which will require constant

¹² The unique technologies needed to extract the oil sands were developed in Alberta, including the Alberta Oil Sands Technology and Research Authority (AOSTRA) and universities in Alberta. The revolutionary steam-assisted gravity drainage technique, that today accounts for the majority of oil sands production, was developed by AOSTRA in collaboration with Imperial Oil, with the first commercial application in 2002.

¹³ Statistics Canada Table 36-10-0211-01. Multifactor productivity and related variables in the business sector and major sub-sectors, by industry.

innovation in reducing inputs of oil and gas (already underway as solvents replace natural gas), lowering emissions from transporting bitumen to refineries, or cutting the energy needed to refine it into a usable product. Some, including Canada's current environment minister, have proposed that switching from natural gas to nuclear power would reduce emissions (Wells 2020). The industry is pursuing the idea of using carbon dioxide as a resource rather than seeing it as waste; the ideal would be to produce methanol from captured GHG emissions and hydrogen (McKenzie-Brown 2014).

Alberta also may have the advantage that its industrial structure evolved without the direct support that many firms in Central and Atlantic Canada have relied on. Alberta's leading oil and gas companies such as Suncor, Syncrude, Cenovus, and Canadian Natural Resources regularly face severe market downturns, but have drawn on their own ingenuity and financial reserves rather than direct government support or investment to survive. These are examples of precisely the "small catastrophes" the Council of Canadian Academies said spurred innovation.

It is fortunate for taxpayers that many of the determinants of innovation and entrepreneurship originate in cultural values. Governments can encourage these values at relatively little fiscal cost, an important consideration since the legacy of record deficits during the 2020 pandemic will necessitate restraint for years to come. Alberta's lack of fiscal capacity to undertake government programs that directly subsidize or sponsor innovation may well be fortuitous given the mixed track record of such interventions in the past. Mansell and Percy attribute some of the rapid rate of small business formation in Alberta to government programs and agencies that assist in their start-up and financing. (57) However, others caution that government-sponsored attempts at value-added and diversification initiatives generally have failed, at great cost to the taxpayer, while creating "an unhealthy culture of corporate cronyism" especially projects funded from the Heritage Savings Trust Fund. (Morton and McDonald, 1) While Alberta has a relatively low level of government debt outstanding, the large deficits incurred during the pandemic nevertheless "threaten increased costs of credit and depressed valuations of business assets and are thus bad for innovation and investment." (Phelps, 2013, 319)

CONCLUSION

The reflexive response of governments to the pandemic was to close borders and lock down businesses, while providing support to people and businesses adversely affected by these actions. Targeted support was necessary and justifiable. However, when the pandemic loosens its grip, governments have to be mindful to open up their economies to competition from abroad and withdraw support from businesses not strong enough to survive without government aid.

With little prospect of large investments in the oil sands for several years after the 2020 shock to oil prices and corporate balance sheets, Alberta will have to rely on more investment in other sectors. Alberta already has shown an ability to diversify its economy away from oil and gas in recent years. However, diversification from its traditional resource base in energy and agriculture also poses a risk of undermining

the cultural values that have fostered its ability to innovate which has been important to sustaining high growth rates over the long-term. At the same time, the oil and gas industry needs to innovate ways to lower GHG emissions to help ensure the long-term viability of what is still Alberta's leading industry.

Alberta historically has demonstrated an openness to trade and a tolerance of creative destruction, with high rates of firm entry and exit and workers moving to growing sectors. It needs to maintain a culture that cultivates innovation and entrepreneurship to restore healthy rates of long-term growth. The best way for Alberta to encourage innovation is to emphasize the cultural values that underpin it, not policies that attempt to micro-manage the innovation process in firms and institutions.

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CHAPTER 8

**WHAT IS THE FUTURE
OF CANADA'S ENERGY
SECTOR? EMERGING
THEMES OF AN
OPTIMAL PATHWAY**

Mac Van Wielingen

INTRODUCTION

Canada's predominantly Alberta-based energy sector is in an era of massive change and transition. This is best understood as a set of macro-forces that are largely beyond our control. The challenge is to adapt and collaborate to find our own way; to discover and pursue an Optimal Path forward within these macro-forces, for the benefit of Albertans, all Canadians and people of the world. The focus of this paper is to describe certain understandings and fundamentals critical to the Optimal Path and to creating a desired beneficial future for all stakeholders.

A NEW ERA FOR ENERGY IN CANADA

There are multiple macro-forces of change that are having a deep impact on the Canadian energy sector and Canadian society. Each of these is important to see and understand as part of the context for how the future will unfold. The combination of these macro-forces can be thought of as creating a new era for the Canadian energy sector, and can be described as follows:

1. A new era of abundance of oil and gas, and substitutes, versus the prior era of shortages.
2. A new era of innovation and accelerated technological change creating efficiencies, "disruption" and advancement.
3. A new era of extreme concern about emissions, climate change, environmental impacts and mobilized "social media" driven activism against oil and gas.
4. A new era of international government policy coordination to decarbonize and reduce climate risk.
5. A new era of Environment, Social and Governance (ESG) expectations within global markets and investment decision making.
6. A new era of reconciliation and the creation of economic opportunities for Indigenous Peoples.
7. A new era of global disintegration and reduced trust in traditional loyalties, with increasing conflict, fragmentation, nationalism and protectionism.
8. A new era of increasing divisiveness and polarization within Canada and increasing alienation in Western Canada.
9. A new era for Canada of relatively stagnant productivity and economic underperformance.
10. A new era of massive increases in government debt, and extreme levels of indebtedness across all sectors of the Canadian economy.

These macro-factors, combined with evolving multiple essential interests within Canada, create extraordinary complexity and challenges. This explains why the idea of an Optimal Path based on balance, intelligent trade-offs and the capture of strategic synergies is critical to produce the best possible result for all stakeholders.

OPTIMAL PATH: SOLVING FOR MULTIPLE ESSENTIAL OUTCOMES

One of the most powerful emerging understandings, whether we like it or not, is that the desired outcomes of energy policy are not singular. They are multiple, overlap, are often in conflict, and can potentially operate synergistically. This reality points to the need for clear frameworks within which to hold multiple objectives, interests and often opposing positions, and to support the process of identifying mutually reinforcing “synergistic” strategies.

The essential priority of reducing emissions must be considered alongside our economic and social aspirations, and our need for governance integrity including, at the highest level, the functionality of our nation. These realities can be seen throughout the world where specific countries are assessing their own essential aspirations differently and shaping their energy pathways accordingly.

One emerging understanding is that mainstream thinking on ESG is insufficient and must be expanded to explicitly include Economics. Strategies and pathways must in fact solve for four essential desired outcomes:

- Economic aspirations, to create and sustain income for Canadian workers and to contribute to the prosperity of all Canadians;
- Environmental aspirations, to transition to a low-carbon future and to protect all critical aspects of our environment;
- Social aspirations, to create value through public services, education, health, safety, public infrastructure, diversity and the inclusion and well-being of Indigenous Peoples; and
- Governance aspirations, which include regulatory effectiveness, fairness and governance integrity, which underpin the functionality of our institutions and the unity of our nation.

There is no one variable or desired outcome to pursue with singular focus. This understanding is emerging as a theme that will be part of what shapes the future of energy in Canada, and indeed corporate governance and the economy in different ways.

The relevance and applicability of ESG as it is now understood and applied is limited by the exclusion of the always important reality of economics. Nowhere is this more clear than in energy policy, as economics has relevance to all stakeholders.

- Consumers are concerned with costs and affordability.
- Employees within the energy sector need opportunities and income.

- Indigenous Peoples aspire for resource ownership as a path to economic autonomy.
- Investors are concerned about appropriate returns on dollars at risk.
- Lenders worry about getting loans fully serviced and repaid.
- Corporate leaders are required to responsibly allocate capital under their authority.
- Government needs tax revenues to sustain public services and to fund public debt.

Economics is of fundamental importance in many ways to all stakeholders. It is not simply about profit for the corporate sector.

Economics should be an integral part of ESG, not an afterthought; accordingly, the new construct that is emerging is Economics and ESG, or E-ESG.

The idea is that we do not talk about ESG without integrating economic perspectives and we do not talk about Economics without integrating ESG. The direction this takes is consistent with the idea of stakeholder capitalism and corporate stakeholder governance.

The E-ESG construct has more usefulness within the corporate sector, which has a fiduciary responsibility for the management of society's private and public capital (or accumulated savings).

It also conforms better with the fiduciary responsibilities of institutional asset managers where the maximization of returns is a critical part of stewardship. It also places consumer and household needs for affordability right up front; again, not as an afterthought.

The inclusion of economics also serves as a powerful framework to support policy and government decision making, as a means to capture all essential interests within Canadian society, and as a new way to think about our national interests.

The expanded E-ESG framework supports clarity in the understanding of conflicts and trade-offs, and the possible capture of critically important synergies in strategy, policy and decision making, for all corporations, organizations and institutions.

Leadership must think broadly about all that is important. Canada's energy sector cuts across "all that is important" in different ways for all Canadians. "All that is important" is captured within the E-ESG construct.

OPTIMAL PATH: THE ENERGY TRANSITION AS EVOLUTION

The idea of a "quick" transition off hydrocarbons, within 10 or 15 years, has been controversial but is increasingly giving way to the reality that the transition will be multi-decadal, even multi-generational, and is best described as an energy evolution. To quote author Vaclav Smil, "[A]ll energy transitions have one thing in common: They are prolonged affairs that take decades to accomplish, and the greater the scale of

prevailing uses and conversions, the longer the substitution will take” (Smil 2010). This is a critical understanding that invites more pragmatic thinking and more grounded, concrete planning.

It is a fact that oil demand in most developed countries plateaued many years ago, corresponding with a decoupling of economic growth and energy usage. For example, oil demand in most of the larger European countries — France, Germany, Italy, Netherlands, Spain and the UK — peaked in the early or mid 2000s. OECD oil demand peaked in 2005 (Looney 2020).

The forces and evidence of peak oil demand have been in front of us for a long time. Now with momentum building to decarbonize and with advancing technologies, notably the electrification of transportation, the plateau and decline of oil consumption will become more pronounced and obvious. However, emerging and developing countries now represent 60 per cent of global energy demand and account for 90 per cent of oil demand growth over the 10-year period to 2019 (Looney 2020). Continued high rates of growth in developing countries is a key reason why the decarbonization transition will be long-term.

A second reason for the extended time frame to decarbonize relates to Smil’s reference to scale; the size and pervasiveness of the hydrocarbon complex in modern society. An illustrative example is the scale of the existing global stock of internal combustion engine vehicles.

On a global basis, electric vehicles (EVs) represent only 2.6 per cent of new vehicle sales and less than one per cent of the global stock (International Energy Agency 2020a).

In Canada in 2019, new EV¹ registrations were 2.9 per cent (Statistics Canada 2021a), which is just above the world average of 2.5 per cent (McKinsey and Company 2020).

EVs are the future of the automotive industry for many reasons, not the least of which is to enhance air quality in large cities. But if you look at the growth of EV sales in isolation it can create a false impression on the timing of a roll-over of stock. It is hard to grasp the size of the global fleet, which is over one billion vehicles.

A realistic picture, whether we like it or not, is that the plateauing and decline of oil demand will occur over a very long time frame. Further, most major institutional forecasters see a more stable, if not robust, long-term outlook for natural gas demand as it is abundant, relatively inexpensive and offers environmental advantages, certainly compared to coal.

Demand will eventually peak, plateau and decline, just as the world population will, but there is a problem if we interpret this as some sort of marker for the death of the Canadian oil industry. This leads to thinking on energy policy in the wrong direction, and it is a shallow generalization that distracts from a broader, more complex reality.

¹

EV’s include battery electric vehicles and plug-in hybrid electric vehicles. Hybrid electric vehicles with a rechargeable battery pack in addition to having an internal combustion engine were not included in this analysis.

This more complex reality is reflected in an adaptive, strategic mindset, where Canadian expertise could just as easily make us leaders, not victims of transitioning global energy systems. It could be applied to advance the long march to reduce emissions, lessen costs, increase efficiencies, maintain our reliability and “win as much of the available market as possible.” The idea is to extend the life of our resource and capture critical synergies. An example of this thinking is reflected in the words of David Dodge, former Bank of Canada governor: “The lifespan of oil needs to be stretched out — adjusting for the negative effects of emissions — until we have developed replacements for the lost export revenues. ... These earnings are needed to pay for the greening of our energy supplies” (Dodge 2020). The full story is even larger than the synergistic funding of green energy; it is funding support for Canada’s heavy social costs, growing debt service costs and more generally to support Canada’s post-COVID recovery.

These synergies and the interconnected realities of Economics and ESG point to an increasingly pragmatic mindset taking hold among most decision makers within industry and government. Vague and sometimes emotion-laden aspirations are being replaced with rigorous analysis, an in-depth understanding of trade-offs, an embrace of multiple technologies and solutions, and an understanding that our existing energy resources, technologies and systems offer opportunity and advantage in the context of the long path to decarbonization.

Canada’s oil production is arguably the most reliable source of oil in the world. We have the world’s third largest oil supply; about 97 per cent of which is contained within the oil sands (Natural Resources Canada 2020a) and represents about 75 per cent of North America’s total oil reserves (Oil Sands Magazine 2020). Critically important, and often overlooked, the oil sands have essentially no natural decline versus traditional wells. Additionally, the oil sands do not consume capital in the same way as conventional production, which is another feature of its reliability. Production from oil sands can be maintained with minimal capital outlays even through a severe downturn year such as 2020. All of this exists within a country that has a high level of political and social stability, unlike many other global suppliers.

The lengthy time frame of decarbonization and Canada’s long-term world-scale energy resource is integral to an Optimal Path where the Canadian energy sector competes on carbon, ESG, reliability and other fundamental criteria to extend the life of this strategic asset.

The critical questions for Canada are strategic in nature, and this is where we are now focused. How can we become more competitive in a likely multi-decadal, declining market? How can we develop synergistic opportunities for clean, low-emission technologies and products, using our resources, established expertise and technology? How can we lever our advantages, meet emissions targets, and enhance our Economic and ESG performance, to serve Canadians and all people of the world? The future of Canada’s energy sector will be heavily influenced by how we respond to these questions.

OPTIMAL PATH: CANADA AS AN ADAPTIVE ENERGY AND RESOURCE ESG ACHIEVER

The job of industry has changed; customer preferences have changed. The public, investors, lenders and stakeholders are no longer preoccupied with the perception of a limited resource. But not long ago, the public was preoccupied with and even alarmed about the risk of shortages.

As an example, the title of a report published in 2011 stated, “The Peak Oil Catastrophe-in-Waiting.” The first sentence reads, “The United States continues to slumber while a catastrophe lies in wait” (Hunt 2011).

When this report was written, the U.S. and Canada were on the verge of a supply-side revolution. The industry responded, adapted and ultimately disrupted itself through technological advancement. We are now in an era of supply abundance for oil and gas, at least in North America, and renewables as substitutes for hydrocarbons are now commercially viable. This is a positive change, as there are more supply choices at reduced costs.

Customer focus has now shifted to environmental impact, specifically managing a low-carbon future, with high ESG standards and performance. Industry is clearly making a parallel, responsive shift to reflect the preferences and needs of its customers and stakeholders.

The response could be encapsulated as:

“Our customers want low-carbon energy products and high ESG standards and, as leaders in business, we will deliver.”

Canada’s energy sector now has the highest ESG rankings amongst the top 10 oil and gas producers in the world (see Table 1). First in the Sustainable Development Index (Sustainable Development Report 2020). First in the Environmental Performance Index (Environmental Performance Index 2020). First in the Global Peace Index (Institute for Economics & Peace 2020). First in the World Happiness Index (Helliwell, Layard and Sachs 2019). First in the Social Progress Index (Social Progress Imperative 2019). First in the Women Peace Security Index (Georgetown 2019). First in the Human Freedom Index (CATO 2020). First in the Human Development Index (Human Development Reports 2020). First in the Democracy Index (Economist Intelligence Unit 2020). First in the Corruption Perception Index (Transparency International 2020). First in the Rule of Law Index (World Justice Project 2020). First in the World Press Freedom Index (Reporters Without Borders 2019). First in the Resource Governance Index (Resource Governance Index 2017).

When compared to other major global energy suppliers, Canada’s ESG performance is the best in the world.

Table 1: ESG Rankings: Top 10 Oil Producers

Average Score (1-10)			Producer Ranking by Size*																		
			ECONOMIC	ECONOMIC	ENVIRONMENT	ENVIRONMENT	SOCIAL	SOCIAL	SOCIAL	SOCIAL	SOCIAL	SOCIAL	GOVERNANCE	GOVERNANCE	GOVERNANCE	GOVERNANCE	GOVERNANCE	GOVERNANCE	GOVERNANCE		
			Economic Freedom Index 2020	Most Competitive Economies 2020	Sustainable Development Index 2020	Environmental Performance Index 2020	Global Peace Index 2020	World Happiness Index 2020	Social Progress Index 2020	Women Peace Security Index 2020	Human Freedom Index 2020	Human Development Index 2019	Democracy Index 2019	Corruption Perceptions Index 2020	Global Entrepreneurial Index 2020	Rule of Law Index 2020	World Press Freedom Index 2020	Resource Governance Index 2017	Ease of Doing Business 2020	Enforcing Contracts 2020**	Trading Across Borders 2020
Canada	1.6	4	FIRST	FIRST	FIRST	FIRST	FIRST	FIRST	FIRST	FIRST	FIRST	FIRST	FIRST	2	FIRST	FIRST	FIRST	3	9	2	
U.S.	2.2	1	2	3	2	2	5	2	2	2	2	2	2	3	FIRST	2	2	2	FIRST	3	FIRST
U.A.E.	3.9	7	3	2	7	3	3	3	6	3	6	3	7	2	3	3	5	7	2	2	5
Kuwait	5.4	10	4	-	9	4	2	6	3	6	4	6	4	6	6	-	4	5	7	7	9
Brazil	5.6	8	8	7	4	5	6	5	4	7	3	8	3	7	9	4	3	3	8	6	7
China	5.8	5	7	4	3	10	4	8	8	5	7	9	9	5	4	5	10	4	5	FIRST	3
Russia	5.9	3	6	6	5	6	9	7	5	4	5	5	6	8	8	6	6	6	4	4	6
Saudi Arabia	6.6	2	5	5	8	8	7	4	9	9	8	4	10	4	5	-	8	10	6	5	4
Iran	8.1	9	9	-	6	7	8	10	7	8	10	7	8	9	7	7	9	9	9	8	8
Iraq	9.1	6	-	-	10	9	10	9	10	10	9	10	5	10	-	-	7	8	10	10	10

* U.S. Energy Information Administration (EIA), <https://www.eia.gov/tools/faqs/faq.php?id=709&t=6>.
 ** The enforcing contracts indicator measures the time and cost for resolving a commercial dispute through a local first-instance court, and the quality of judicial processes index, evaluating whether each economy has adopted a series of good practices that promote quality and efficiency in the court system (1).
 One explanation for Canada's low score on this index is that of the index's three components (cost, quality and time) we do worst on time: 910 days from start to final payment. That puts us 177th out of 190 countries (2). Compare this to China, whose Hainan High People's Court is now employing big data and AI technologies, in a bid to increase efficiency and advance standardization in judicial services (3).
 1. Doing Business. Enforcing Contracts. <https://www.doingbusiness.org/en/data/exploretopics/enforcing-contracts/what-measured>
 2. Financial Post. <https://financialpost.com/opinion/william-watson-canadas-lousy-ranking-on-upholding-contract-rights-could-be-the-rule-of-too-much-law>
 3. China Daily. AI-assisted sentencing speeds up cases in judicial system. http://www.chinadaily.com.cn/cndy/2019-04/18/content_37459601.htm

Certain specifics pertaining to Canada’s energy sector and ESG performance are noteworthy, and ultimately will contribute to new understandings that will shape our future.

- Our electricity sector is amongst the greenest in the world. In 2018, 82 per cent of electricity in Canada came from non-GHG emitting sources (Natural Resources Canada 2020b), almost twice the 44 per cent average for countries part of the Organization for Economic Cooperation and Development (OECD) (International Energy Agency 2020b).
- Canada is the second-largest producer of non-emitting hydroelectric power globally, after China (Canada Energy Regulator 2021).
- Canada was the first country in the world to commit to national methane emission regulations (Maljković 2018) and is recognized as a global leader in methane reductions from flaring and venting (CBC News 2018).
- Canada is a world leader in carbon capture and storage (Natural Resources Canada 2019).
- Canada has a proven world-class pipeline transportation system that is continuously getting safer. Over the past 10 years, liquids incidents have declined by 90 per cent and 99.3 per cent of oil spilled was recovered through clean up (National Energy Board 2019).

- Canada has a proven world-class marine safety system along the world’s longest coastline. There are 20,000 tanker movements per year, and we have had no significant accidents or spills (ClearSeas 2019).
- Worker safety standards and outcomes are exemplary. Fatalities are down 90 per cent since 2001 (Energy Safety Canada 2018).
- The Canadian resources sector is the largest employer of Indigenous Peoples in the Canadian economy (Coates 2016; Statistics Canada 2021b), and new participation structures are evolving that will prove transformational for industry and Indigenous communities.²
- We are among the best in corporate governance in the world (BMO Capital Markets 2019). Virtually all global reports and independent rankings confirm this.
- The oil and gas sector is the largest investor in clean energy technology in Canada (Natural Resources Canada 2021).

Across the energy and technology sectors, there are many new technologies being developed which will improve environmental performance, for example:

- The use of solvents versus steam in oil sands recovery with a substantial reduction in emissions.
- Recycling of water in hydraulic fracturing operations, resulting in reduced freshwater consumption and less trucking.
- Proliferation of multi-well pad drilling, dramatically lowering the surface impact in steam-assisted gravity drainage (SAGD) for both oil sands and conventional production.
- Increasing usage of natural gas for drilling and hydraulic fracturing fleets displacing high emission diesel fuel.
- Microseismic monitoring and advanced modeling to mitigate the risk of induced seismicity.
- Production of green electricity from crude oil via microbial transformations.
- Fugitive methane emission detection through advanced cameras and sensing devices.

Additionally, extensive research and entrepreneurial initiatives relating to the emerging circular economy are underway; these offer high potential, strategic and “game-changing” impacts. The circular economy looks to reduce, recycle or return emissions and rethinks carbon as a valuable feedstock, not a waste product. Examples of the circular economy and other innovation themes are (Alberta Innovates 2020):

- New ways to use carbon, such as carbon fiber as a building material and in consumer products.
- New ways to use, store, and remove carbon to serve a burgeoning hydrogen market.

²

National Occupational Classification includes trades, transport and equipment operators; natural resources, agriculture and related production; manufacturing and utilities.

- New ways to use bitumen beyond combustion.
- New ways to use oil and gas technology in geo-thermal projects to extract heat for energy.
- New ways to support electrification, hydrogen and materials transport through infrastructure corridors.^{3,4}

One noteworthy example of adaptation is that Alberta is expected to lead Canadian growth of renewable energy capacity between 2018 and 2023 (Williams 2021). Another example is the recent announcement by Suncor and ATCO of a world scale “multibillion-dollar” project to produce over 300,000 tonnes annually of hydrogen. This project will help Canada reach its 2050 net-zero greenhouse gas emissions target by capturing and storing over 90 per cent of the carbon dioxide produced from the energy required to make the hydrogen (CBC News 2021).

The main point is that an adaptable, innovation driven mindset exists in Canada’s energy sector, and it is deepening and evolving. Responsiveness, innovation and adaptation has happened and is happening.

More broadly, Canada looks like an ESG super-achiever in the context of all countries that are engaged in meaningful resource development (those that generate a level of resource rent equal to or greater than that of Canada, which is 2.5 per cent) (Migiro 2018; Sawe 2019; Sauter 2020). On environmental factors we rank third of 180 countries meeting this resource rent criterion (Yale 2020); on sustainability factors we rank second of 180 countries (Sustainable Development Report 2018); and on governance factors we rank sixth of 180 countries (World Bank 2020). The fact that Canada is an energy and resource ESG super-achiever surprises many, given the opposite emphasis from many activist groups and some political leaders. The world will continue to consume resources, particularly with its growing population. Our comparative global ESG rating points to the opportunity for Canada to embrace a vision to be the world’s leading responsible resource developer.

The issue of emissions and climate risk is hugely important and deserves special focus. In the context of Canada as an ESG achiever, it can now be observed that the energy sector in Canada has turned the corner in its commitment to reduce emissions.

The commitment and progress of Canada’s energy industry is demonstrable.

- A number of leading Canadian companies, which together represent over 50 per cent of our production, are committing to ambitious reductions or net zero by 2050 (Canadian Natural Resources 2018; Bakx 2019).

³

The Canadian Vitality Pathway (CVP) is an industry agnostic, non-partisan, non-governmental proposal to create a ribbon of economic pathways for future trade and conveyance. They have envisaged commercial connections between trade centers that are needed today and for generations into a zero-emissions future. They establish rights of way that respect Indigenous rights and directly involve Indigenous and non-Indigenous Canadians in prosperity. <https://www.vitalitypathway.ca/>

⁴

The Canadian Northern Corridor is a conceptual network of physical corridors connecting Canada from ‘coast to coast to coast.’ The School of Public Policy’s research program will provide the information and analysis necessary to establish the feasibility of the Canadian Northern Corridor. See <https://www.canadiancorridor.ca/>

- Canada is a global leader in methane regulations and reductions (Masnadi et al. 2018). This is especially true when looking at the 30 countries with the most natural gas flaring; Canada is close to the best (The World Bank 2020). Between 2014 and 2018, Canada reduced emissions from flaring by 38 per cent, compared to an average of around five per cent for 29 other energy producing countries. Over this same period, the U.S. increased its flaring emissions by 25 per cent (Canadian Energy Centre 2020).
- The natural gas sector in Canada is probably the greenest in the world, and LNG Canada will be the greenest, lowest-carbon Liquid Natural Gas (LNG) in the world relative to existing suppliers (Pierce 2019; Canadian Association of Petroleum Producers 2020).
- Canada is also a global leader in carbon capture and storage (Natural Resources Canada 2019): The Alberta Carbon Trunk Line, the world's largest carbon capture and utilization system, is now operational (Bakx 2020).
- Over the 20-year period 1998-2018 Canada's emissions per unit of GDP declined by 34 per cent (Canadian Association of Petroleum Producers 2021).
- From 1990-2016, in the industrial sector in Canada, which includes oil and gas extraction, energy intensity has decreased by 15 per cent (Natural Resources Canada 2020b).
- Total oil and gas industry emissions have increased overall because of rising oil sands production and exports; however, overall emission intensities have decreased by 28 per cent since 2000 (Natural Resources Canada 2019) and are set to decline a further 20 per cent through to 2030 (IHS Markit 2018).
- Emission intensities from new oil sands projects are close to, or below, the average of crude oil refined in the U.S. (Suncor Energy 2018; Cenovus Energy 2018).

The issue of energy intensity and emissions per unit of production seems to be a bit of a mystery to critical observers of the industry. It must be recognized that Canada is an exporting nation, which accounts for a significant part of our prosperity, and specific to oil and gas, 81 per cent of our oil (Natural Resources Canada 2020a) and 45 per cent of our natural gas was exported in 2019 (Natural Resources Canada 2020c).

What if we can demonstrate that our energy products will “do no harm” on the basis of emissions compared to comparable products in the markets we serve? What if each barrel or unit of natural gas exported not only competes on price and reliability, but also has the potential to reduce emissions in the market being served? The idea that Canada could compete on carbon offers a critical insight into the importance of emission intensities.

How does Canada then justify ceding market share to other suppliers who have less stringent emission and ESG standards? Who is benefiting by Canada not competing in these markets with superior products?

An important sub-theme on the issue of emissions is the growing understanding that this is an end-use consumption problem. An under-recognized reality is that 80 per

cent of emissions come from the end user's preferences and choices as to how oil and gas products are combusted (ARC Energy Research Institute 2016).

Emissions are an issue across the entire economy, which is an understanding that is emerging with clarity in response to a dramatically increasing carbon tax and many recently introduced incentives to reduce consumer and household emissions.

OPTIMAL PATH: “BEST BARREL” AS A CREDIBLE, ASPIRATIONAL PATH

A credible aspirational path for Canada's long-term transition to decarbonization, where oil and gas is phased out over 30, 50, or 100 years, whatever the timeframe, can be encapsulated in the following perspective:

“The last barrel to be phased out should be the best barrel, and the best barrel should be Canada's barrel.”

This mantra for the future should be viewed figuratively, not literally. It acknowledges the transition to a low-carbon or net zero world; it is credible; it is doable; it is based on the concepts of excellence and competitiveness; it defines a strategic position with respect to stakeholder demands and pro-development Indigenous groups who recognize that resource development will benefit their future; and it positions Canada to serve the needs of a growing global population with clean, reliable and ethical energy.

The concept of “best barrel” is a metaphor that captures all energy products including liquids, hydrogen, natural gas and electricity. Arguably the implicit principle of low carbon (or no carbon) and high ESG should also apply to all resources (and manufactured products) as part of Canada's competitive brand.

A commitment to the “best barrel” changes the narrative on the challenge for the Canadian industry. It leads logically to the question, “what does the best barrel look like and how do we get there?”

What is the best barrel? It is a multidimensional, market and strategic-based question as to how we believe our energy sector can compete and meet its Economic, Environment, Social and Governance goals (E-ESG), including the priority of meeting Canada's national decarbonization targets.

Whichever way we define it, it needs to be real, well-evidenced, and we need to be prepared to present it to the world. The concept of the best barrel, or the best energy products, encompasses a set of essential factors. Each factor is a determinant of success, and each is an imperative in its own right.

For the public and society, these essential factors include carbon, costs, a set of ESG factors and innovation:

- Carbon levels and intensities
- Costs, affordability and reliability

- Environmental footprint including land, water and air
- Safety in product transportation systems
- Social impact including workplace safety of employees, the safety of communities, and the quality and stability of employee experience
- Unbiased inclusivity, respect and tolerance of all stakeholders
- Opportunities for Indigenous Peoples
- Confidence in an industry that is innovating to create solutions

For industry and the corporate sector, serving the underlying needs and solving many related issues and problems requires that certain conditions are satisfied. The essential factors are as follows:

- Access to markets and the full market price
- Cost competitiveness and reasonable levels of profitability
- Access to specialized workplace capabilities and expertise
- Government policy that is supportive of capital formation and investment, and supportive of the innovation necessary to meet societal needs
- Regulatory excellence that facilitates an ease of doing business, and that sustains and enhances Canada’s competitiveness in global markets
- Reasonable, fair and competitive taxes

The Canadian energy sector is already implicitly committed to the “best barrel” path, but much more needs to be done, notably a further material reduction in emissions.

OPTIMAL PATH: ECONOMIC REALITIES NECESSITATE A RESET OF PRIORITIES

In post-COVID recovery, even when our economy goes back to “normal,” our indebtedness will not go back to where it was for many years, if ever. The inevitable consequence is a loss of financial capacity and resiliency.

Prior to the COVID-19 lockdown, the economic fundamentals in Canada were weak:

- In 2019, growth in GDP per capita since 2013 was less than one-half that of the U.S., and Canada had the worst performance of all G7 countries (Business Council of Alberta 2019).
- In 2017, business investment was about 20 per cent below the peak levels of 2014. In 2020, it moved another 10 per cent, for a total of 30 per cent below the peak in 2014 (Statistics Canada 2020). Even outside the resource extraction sector, business investment remained below 2014 levels (Fraser Institute 2020).
- According to the 2018 World Investment Report, the stock of foreign direct investment in Canada has grown at half the global rate since 2015 (United Nations 2018).

- 2019 per worker investment placed Canada 15th among the 17 OECD countries. In Switzerland, businesses invested twice as much per worker as Canadian businesses (Fraser Institute 2017).
- Canada's labour productivity has significantly lagged behind the U.S., our main customer and competitor. In 2019, Canada generated \$52.60 in output per hour of labour compared to \$71.80 in the U.S.⁵ (Organization for Economic Cooperation and Development 2021).

The general point is this: we were in a slow-moving crisis of a lack of investment, competitiveness, lagging productivity and economic underperformance before the pandemic-related collapse. Now, we can add excessive indebtedness to our list of challenges.

One thing that we have learned in the COVID-19 crisis is that we have only one economy, and it must be able to support all of Canada's debt at its various decision-making levels.

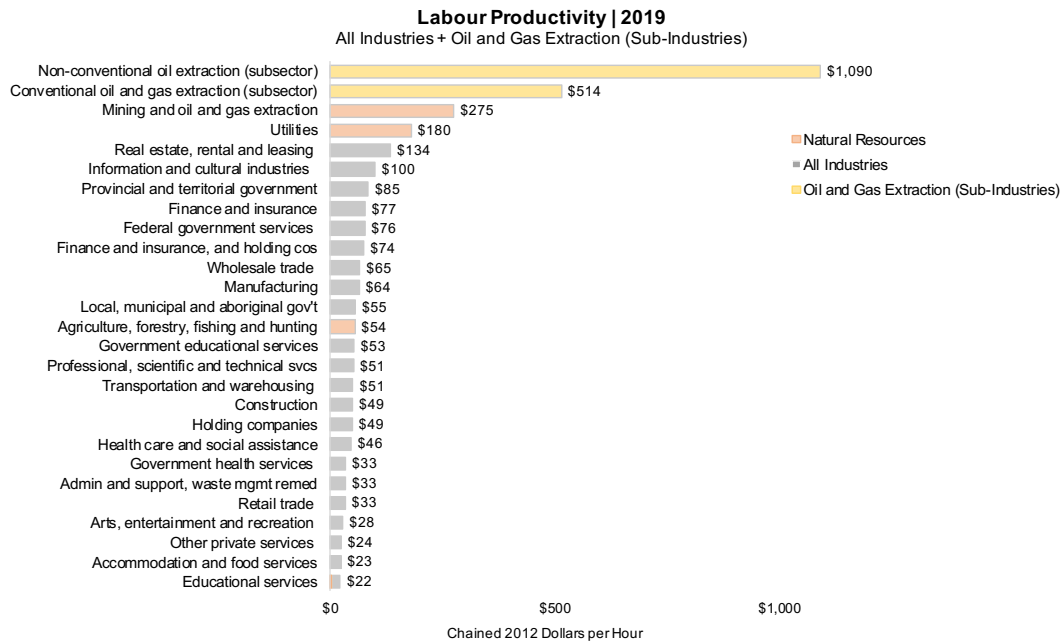
We have also learned that in an economic crisis, the national government is called upon to backstop the credit demands of all provinces, and to an extent, even corporate and household debt.

Total aggregate debt across all sectors is now approximately \$7.2 trillion based on the most current available data.⁶ This is 380 per cent against our \$1.9 trillion economy (Statistics Canada 2021c). Canada's aggregate indebtedness on a per capita basis and relative to the size of our economy is now among the highest in the world. A major challenge for Canada is how we grow through our debt problem and rebuild much needed fiscal capacity and resiliency.

An important insight into the response needed to grow through our debt problem can be seen in the data on labour productivity; the value of economic output (GDP) per hours worked, across all sub-sectors of the Canadian economy. This can be viewed as a proxy for value creation or, if you run a business, this tells you which of your business lines are most profitable, i.e. "paying the bills."

⁵ NOTE: Canada's 2019 number is a Viewpoint Research internal estimate based on data from Study of Living Standards in Ottawa.

⁶ Aggregate debt calculated from the sum of Bloomberg indexes BDBT1BCA Index & BDBT1JCA Index for corporate debt; CNNWCDNB Index for household debt; GCSOTOTL Index for national debt; and the Government of Canada November 2020 Fiscal Reference Tables for subnational debt.



Viewpoint Group. Source: Statistics Canada. Table 36-10-0480-01. Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts. Chained (2012) dollars per hour.

Note: Non-profit institutions were excluded due to the distortion of very large revenues (grants) against a relatively small number of labour hours as the revenues are essentially passed through on relatively short time frames. Further, non-profit institutions rely heavily on volunteer workers. Additionally, a significant portion – 86 per cent – of charitable giving comes from Individuals and Corporations (Giving USA 2019).

This chart clearly shows that the highest productivity sectors in the Canadian economy are all linked with energy and resources. It also explains why Alberta's income and standard of living, and its fiscal contribution to Canada, have been so strong. Further, it points to the importance of "scaling up" to create prosperity. Accessing export markets for Canada's energy products allowed the industry to attract capital and create enormous scale relative to labour as an input. Historically, this is why resource development has been so important to Canada.

It is hard to imagine how Canada can regain its fiscal strength and resiliency without the engine of our energy and resource sectors, the highest value-add sectors of our economy. The opportunity is to meet our emission and environmental goals, and to extend the value and maximize the long-term economic benefits of our strategic resources as an integral part of our optimal path.

CONCLUSION

There are numerous powerful macro-forces that are shaping the future of Alberta and Canada's energy sector over which we have minimal direct control, but we can meet each with an appropriate mindset and response. The new era of energy abundance, first and foremost, has to be met with cost competitiveness. Accelerated technological change has to be met with entrepreneurialism and cohesion within industry and government to support innovation. The new era of extreme concern about emissions and climate risk must be met with material initiatives to reduce emissions and environmental impacts. International government policy coordination must be met with cooperation as well as assertiveness to represent our interests. The new era of ESG

expectations requires that we stand within that framework to develop our strategies. The new era of reconciliation with Indigenous Peoples requires bold new structures to support Indigenous ownership in resource development. The new era of reduced trust in traditional international loyalties necessitates a focus on supply chain security and the diversification of markets. The new era of increasing alienation in Western Canada begs for a nationally inclusive embrace of all interests within Canada; a mindset at the national level that must transcend regionalized polarization. The new era of stagnant productivity and extreme levels of indebtedness in Canada necessitate a reset of priorities towards growth and the rebuilding of fiscal capacity.

The other broad response to the complexity of change is an Optimal Path based on realities unique to Canada and developing strategies where we have some control. This involves trade-offs, balancing costs and benefits, and identifying and capturing strategic synergies relevant to Canada's essential aspirations. This is a reality that all countries of the world are facing, however intentional each may be, each attempting to find an optimal pathway based on unique circumstances and essential interests.

On the Optimal Path for Canada, the balance of economic priorities against other essential aspirations must be restored. Economics cuts across the interests of all stakeholders and should not be an afterthought or of secondary importance. Economics must be adjoined to the now mainstream ESG construct. The four quadrants of E-ESG then align with the emerging movement often referenced as stakeholder capitalism, with some groups describing these four anchoring priorities as Prosperity, Planet, People and Principles of Governance (World Economic Forum 2020). Whatever the nomenclature, these frameworks are all pointing to what is most important for all global citizens. Also critical to the Optimal Path is embracing realistic time frames for decarbonization. Canada must be careful in making medium term, i.e. 2030, commitments as our electricity sector is already one of the greenest in the world. We do not have the same potential for quick wins to eliminate emissions as other countries do (notably the U.S.) which rely on higher levels of coal to generate power. Decarbonization will also be more challenging in Canada as our export industries are relatively high emitters. Understanding that decarbonization will occur over a long time frame enables the development and phasing in of multiple technological solutions, notably carbon capture and utilization, direct air capture, small scale nuclear, nature-based solutions and climate risk mitigation.

All possible solutions must be seen as part of an integrated energy sector, collaborating with and building upon more traditional hydrocarbons, but also expanding to include wind and solar, hydrogen, nuclear and all related energy efficiency and environmental technologies.

Another theme for the Optimal Path unique to Canada is our comparative global advantage as an energy and resource supplier. Based on our resource abundance, expertise, technology, infrastructure and ESG standards and performance, Canada is the best, or certainly among the best, on all fundamental criteria; yet further major commitments are needed to reduce emissions. The fundamentals exist for Canada to credibly pursue a vision to be the world's leading responsible energy and resource supplier.

Canada's Optimal Path is also uniquely reflected by the opportunity to offer the "best barrel" in energy markets, or even all markets we serve with our resource products. Specific to energy, we need to "break the back" of our emission challenge and then, arguably, no other major energy developer in the world will compare to Canada.

Although the fundamentals of Canada's Optimal Path will evolve, at this time there is no question that Canada needs to reset its priorities towards economics, competitiveness, productivity and the rebuilding of a sound fiscal position. Canada has used up much of its spare fiscal capacity which would normally act to absorb the shock of unforeseen adverse events, the most obvious possibilities now being ongoing pandemic lockdowns, or rising interest rates and a contagion of debt distress among over-levered countries. The high value-add of Canada's energy and resource sectors must be an integral part of its economic and competitive strategies, otherwise Canada's excessive leverage and loss of fiscal capacity will stay unresolved.

Canada's traditional energy resource is no longer a growth industry in the way it has been, but it is nevertheless incredibly important. It has morphed into a technologically driven, innovative, high cash-generating value creator, increasingly focused on environmental solutions. The base traditional industry will be relatively stable, increasingly recognized as ESG responsible and will be an important partner in the commitment to meet reduced carbon emission goals. Growth in economic value will occur largely through cost and technology-driven efficiencies. The total energy sector, including synergistic technology spinoff opportunities and alternative energy, represents a powerful base for the economy of the energy producing region of Canada and is of great importance to maintaining Canada's prosperity. The key to this optimal future is adaptation, innovation, collaboration and the ability of the different regions and governments in Canada to work together for the best interests of all stakeholders.

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CHAPTER 9

**ALBERTA IN CANADA'S
NET ZERO FUTURE:
SEIZING OPPORTUNITIES
WHILE ADAPTING
TO CHANGE***

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and Jennifer Winter

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INTRODUCTION

The key outcome of the 2015 United Nations Climate Change Conference (COP 21) was a commitment to undertaking actions to hold “the increase in global temperatures to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels” (United Nations 2015, Article 2.1(a)). Known as the Paris Agreement, it was adopted at COP 21 by 196 countries and has since been ratified by 189. Following COP 21, the Intergovernmental Panel on Climate Change (IPCC) wrote a special report on the impacts of global warming of 1.5°C. An important finding in the report was modelling results showing that to meet the 1.5°C target, global anthropogenic carbon dioxide emissions must reach net zero around 2050 and go net negative thereafter (IPCC 2018).

Following the IPCC report’s publication, a growing number of countries have made commitments to reach net zero emissions by 2050. As of December 2020, six countries have legislated the commitment, an additional five countries plus the European Union have proposed legislation, and 13 countries have made the commitment in policy documents (Bazilian and Gielen 2020). Canada is among the countries with proposed legislation.¹ In the U.S., President Biden has announced net-zero by 2050 as the long-term objective of his climate change plan (Reuters Staff 2021; Biden n.d.).

While Alberta does not have an explicit net-zero goal, it has indicated that it will work towards achieving emissions reductions — through technology and innovation — that are consistent with Canada’s international climate commitments (Ryan 2020; Cryderman and Graney 2021). The transition towards net-zero will affect Alberta in two major ways. First, through internal adjustments to reduce emissions and contribute to Canada’s goal of net-zero as a country, and second, by confronting changes in demand for its products and services as other jurisdictions shift to meet their own net-zero goals. We outline transition pathways for Alberta along Canada’s net zero pathways and discuss the challenges and opportunities for Alberta on each of these fronts.

As the highest emitting province in Canada — Alberta’s per capita emissions are 63.2 tonnes per capita, compared to the Canadian average of 19.4 (Statistics Canada 2021; Government of Canada n.d.) — it is easy to think Alberta will face the greatest challenges in supporting a national net zero target. Beyond achieving its own emissions reductions, the province must also confront potential changes in global (and local) oil and gas demand.

At the Earth Day 2021 Leaders’ Summit on Climate, for example, both the United States and Canada committed to ambitious reduction targets for 2030. President Biden announced an emissions reduction goal of 50 to 52 per cent below 2005 levels by 2030 (Sullivan and Liptak 2021; The White House 2021). With the United States currently on track to achieve emissions reductions of only 13-14 per cent relative to 2030 (U.S. Department of State 2016; Environmental Defense Fund 2021), the new

¹

The *Canadian Net-Zero Emissions Accountability Act*, tabled November 19, 2020, makes Canada’s 2050 target legally binding and introduces rolling five-year emissions reduction plans and targets (Environment and Climate Change Canada 2020a; Wilkinson 2020).

goal will require a sharp pivot towards cleaner energy systems and increased energy efficiency. Two pillars of Biden's plan are personal vehicle electrification and a clean electricity grid (Biden n.d.); both will have a sharp impact on American demand for Alberta crude oil and natural gas.²

Canada's reduction target, which was previously a 30 per cent decrease in emissions in 2030 relative to 2005, was adjusted to 36 per cent below 2005 levels in Budget 2021 (Department of Finance 2021). The target increased sharply to 40 to 45 per cent on April 22, 2021 (Office of the Prime Minister 2021). Underpinning Canada's target is a rising carbon price, currently proposed to increase by \$15 per year starting in 2023 and reach \$170 in 2030 (Environment and Climate Change Canada 2020b). This will negatively impact domestic demand for crude oil and natural gas. Complementary policies outlined in Canada's most recent climate plan (released in December 2020) and the 2021 federal budget will further reduce demand. The policies include support for zero-emissions vehicles and public transit, improving energy efficiency in buildings, cleantech technology investment and tax incentives, and a clean fuel standard (Environment and Climate Change Canada 2020b; Department of Finance 2021).

What is less evident are the extensive opportunities for Alberta in the shift towards net-zero. We use provincial results based on modelling from the recent Canadian Institute for Climate Choices (CICC) report on potential Canadian pathways to net zero to outline these opportunities (Canadian Institute for Climate Choices 2021; Navius Research 2021). Of particular note are the continuing benefits that will be afforded by the Western Canadian Sedimentary Basin (WCSB), underlying much of northeast BC, Alberta and Saskatchewan. The WCSB can safely and permanently absorb as much carbon dioxide (CO₂) as we could ever anticipate storing. This makes Alberta a favourable location for direct air capture (DAC) — where CO₂ is pulled from the air and either injected into underground storage or used as an input in other processes — as well as advanced forms of carbon capture, utilization and storage (CCUS).³ CCUS allows for the capture of industrial CO₂ emissions in Alberta, and potentially other areas of the country if new east-west CO₂ pipelines are built (or existing oil and gas pipelines are repurposed). Advanced forms of CCUS would also support blue hydrogen production, where hydrogen is produced by steam methane or autothermal reforming of natural gas. Hydrogen production in turn leads to additional opportunities in Alberta's chemical sector (a core sector in which it already has significant expertise and capacity), including the production of potentially net-zero synthetic fuels and feedstocks like hydrogen, ammonia, methanol, ethanol, ethylene, and BTX. Last, there are also potential opportunities in biofuels production; geothermal energy production;

²

Some of the decline in U.S. demand for Alberta's crude oil and natural gas may be offset by rising international demand. British Columbia in particular may be a key export point to Asian markets. A portion of the Trans Mountain pipeline expansion, for example, may carry crude oil for export. It is scheduled to be completed in 2022 and will increase capacity on the pipeline by 590,000 barrels of oil per day. Construction is also underway on the LNG Canada export facility in Kitimat, which will likely export natural gas from both British Columbia and Alberta. The facility is projected to be completed in 2025 and will provide initial export capacity of 14 million tonnes per annum.

³

CCUS is a family of technologies where known and commercialized chemical absorption and separation processes capture CO₂ from chemical waste streams or combustion flue gas for reuse or disposal underground.

and lithium and iron ore mining, the latter reduced to elemental iron using hydrogen instead of coal.

In this paper, we explore what a net zero emissions policy means for Alberta. We start with a brief overview of the CICC report, its net zero scenarios and some of the key provincial level results for Alberta. We then move to a discussion of the pathways within specific subsectors of Alberta's economy. We conclude with a discussion of the numerous opportunities for Alberta along a net-zero path.

Canadian Institute for Climate Choices' Net Zero Scenarios

CICC released its report, "Canada's Net Zero Future: Finding Our Way in the Global Transition" in February 2021 (hereafter referred to as the CICC Net Zero report). The report outlines different pathways Canada can take as a country to achieve net zero emissions in 2050. These pathways are generated using the gTech computable general equilibrium model from Navius Research. Further background information on the gTech model is available in both the CICC Net Zero report and an accompanying study with technical details on the model from Navius Research (Navius Research 2021).

In total, the CICC Net Zero report examines national pathways to net zero across 62 scenarios characterized by nine separate assumptions. These nine assumptions are: electric vehicle costs; hydrogen costs and blending rate potential; the cost of new non-emitting "firm" electricity generation costs; climate policy action in other major countries; availability of DAC and advanced forms of CCUS (carbon capture utilization and storage);^{4,5} global oil price; competitiveness protection measures; availability of second-generation biofuels; and oil sands production emissions intensity improvements.

We present Alberta-specific results across the 62 scenarios in our analysis below. Most often this takes the form of paths that track the upper and lower bounds on key indicators of interest such as total greenhouse gas emissions, GDP or oil production.

Broadly speaking, Alberta's economy is bookended by two sets of pathways to net zero. In the first set, engineered negative emissions solutions and advanced forms of CCUS are not available and the global price of oil is low. The low oil price causes a significant contraction in oil and gas production, while the absence of negative emissions solutions means that meeting net-zero also requires a significant curtailment in other industrial segments of the province's economy. We refer to these as the "Transformation Pathway" as they necessitate a relatively rapid reorientation by the province towards new areas of economic activity and significant changes in energy systems, necessitating broad structural change to Alberta's economy.

⁴ Advanced forms of CCUS refer to CCUS technologies that can be used for unconcentrated post-combustion emissions. In scenarios in which advanced CCUS is not available, CCUS technology still exists but can be used for concentrated process emissions only, e.g. from raw formation gas processing and hydrogen production.

⁵ This assumption can be further divided into three subgroups. Scenarios in which neither DAC nor advanced CCUS is available, scenarios in which only advanced CCUS is available and scenarios in which both DAC and advanced CCUS are available.

In the second set of pathways, engineered negative emissions solutions and advanced forms of CCUS are available and the global oil price is high.⁶ These pathways are consistent with continued steady growth in Alberta’s oil sector, and there is a narrow set of conditions where production reaches upwards of 5 million barrels per day in 2050. We refer to these as the “Transition Pathway” as they characterize a less rapid change in energy systems and result in the least structural change in Alberta’s economy over the next 30 years. Rather, these pathways allow Alberta to continue growth in many of its current sectors, while simultaneously transitioning at a slower rate into new economic opportunities and imply much less structural change in energy systems and the overall economy.

In the discussion that follows, we largely focus on these pathways as they represent “bookends” in a range of potential outcomes. Both pathways should be interpreted with substantial caution. In the Transformation Pathway, the gTech model is constrained by assumptions based on current information and data — only what is known to be commercial today, or soon, is well described in the model. As a result, the model does not capture the full potential upside of new industries such as blue hydrogen production and synthetic net-zero chemical and fuel manufacturing that will likely transform the Alberta energy sector (Bataille et al. 2018; Bataille 2020), for which it has substantial competitive advantages and capacity. In the Transition Pathway, while Alberta achieves net-zero emissions using engineered negative emissions to compensate for largely business-as-usual fossil fuel CO₂ emissions, only under a highly improbable combination of circumstances would this be consistent with global efforts to reach net-zero. More realistically, to achieve the Paris Agreement target any DAC capacity built in Alberta cannot be used to support ongoing domestic fossil fuel production and consumption in perpetuity. It would instead be used to avoid stranded capital, ease the transition, and offer a means of building up negative emissions capacity for the eventual push toward global net negative emissions post 2050 to 2070.

ALBERTA’S NET ZERO SCENARIOS

The most recent official estimate of Alberta’s greenhouse gas emissions from Canada’s National Inventory Report is 276 Mt CO₂e in 2019 (Environment and Climate Change Canada 2021). Over half of emissions (141 Mt CO₂e) are attributable to the oil and gas sector, with an additional 8 per cent (21 Mt CO₂e) attributable to other industrial and resource sectors. The remaining significant sources of emissions are transportation (12%/34 Mt CO₂e), electricity (11%/31 Mt CO₂e), buildings (8%/22 Mt CO₂e) and agriculture (8%/21 Mt CO₂e). The starting (2020) level of emissions for Alberta in the gTech model is approximately 310 Mt CO₂e. Most of this difference is attributable to an estimated increase in emissions from the oil sands, which are calibrated to align with the oil sands production forecast from the Canada Energy Regulator’s 2019 Energy Futures report.

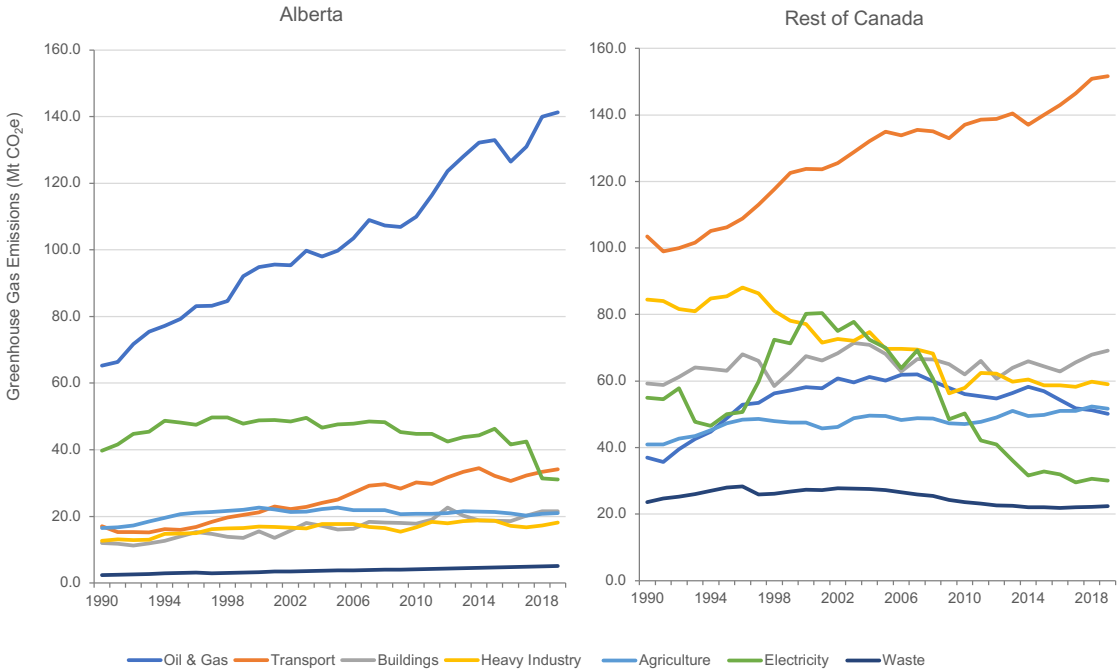
⁶

The two sets of pathways we describe here only isolate two of the nine assumptions that characterize each scenario in the gTech model. As a result, they each encompass a group of scenarios (12 individual scenarios for the Transformation Pathway and nine for the Transition Pathway). Also of note is that while these scenarios typically bookend economic indicators such as GDP and oil and gas production, they are not a bookend to all results in the model. For example, along the Transition Pathway, Alberta’s greenhouse gas emissions in 2050 fall in the mid-range across all possible scenarios (see Figure 1 and accompanying discussion).

Relative to the rest of Canada, Alberta’s greenhouse gas emissions have followed a unique path over the last thirty years (Figure 1), rising from 172 Mt in 1990 to 276 Mt in 2019. This increase is primarily from rising emissions in the oil and gas sector. Also contributing is strong economic growth in other industrial sectors, coupled with above average incomes and population growth. The combination of these factors has resulted in Alberta’s greenhouse gas emissions outpacing the rest of Canada in virtually all sectors. The rest of Canada, in contrast, has only seen substantial emissions growth in a single sector – transportation. Further, these increases have been nearly offset by substantial declines in emissions in heavy industry and electricity. As a result, from 1990 to 2019, emissions in the rest of Canada increased by only six per cent, rising from 430 to 454 Mt.

The pathway for Alberta’s greenhouse gas emissions over the last 30 years presents unique challenges along a pathway to net zero over the next 30 years. A continued high level of emissions from Alberta’s industrial sector means the success of negative emissions technologies will be a key determinant of the degree to which Alberta’s economy will need to restructure – and potentially find new sources of economic activity – along a net zero path. While Alberta is transitioning from coal to natural gas power by 2023, there are no plans at present to reduce the use of most of the natural gas.⁷ In addition to being a large source of emissions that still needs to be eliminated, this also limits the province’s near-term options for using electrification to reduce emissions in sectors such as transportation and buildings.

Figure 1: GHG Emissions by Economic Sector, 1990 - 2019

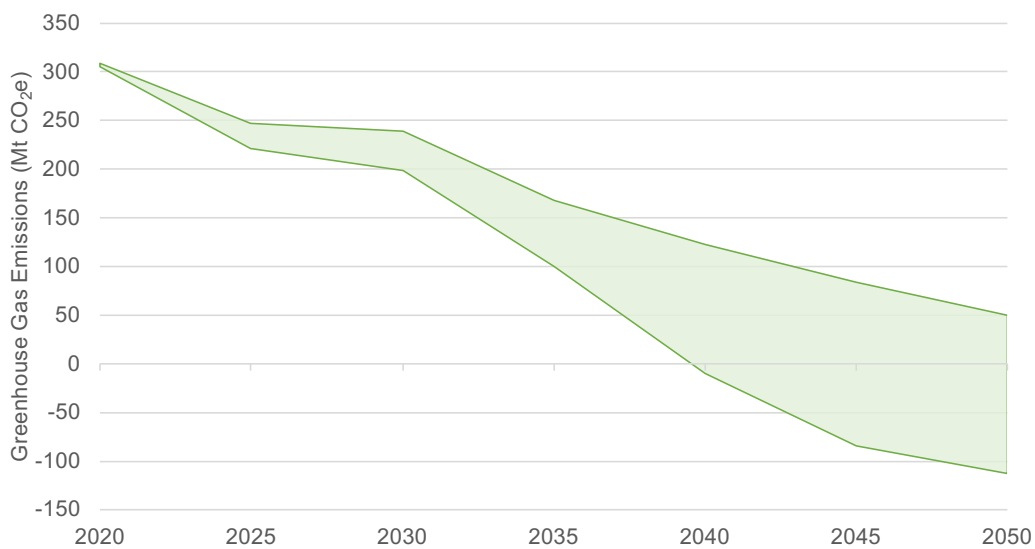


Source: Government of Canada (n.d.).

⁷ Alberta announced its goal to eliminate emissions from coal power electricity generation in November 2015. The phaseout is currently anticipated to be completed by 2023, well in advance of the province’s original goal of 2030. The phaseout, however, still lags other provinces; Ontario, for example, eliminated coal power between 2007 and 2014.

All scenarios show that Alberta’s pathway to net zero starts immediately, with emissions declining by 61 to 88 Mt over the next five years (Figure 2). Most of these early reductions would be driven by natural gas fuel switching (primarily in electricity and the oil sands), with smaller amounts potentially attributable to a shift towards non-emitting electricity, energy efficiency and CCUS. Emissions reductions slow down significantly between 2025 and 2030, before picking up and steadily declining across all scenarios through to 2050. Alberta’s final 2050 emissions level is estimated to range between -113 Mt and +50 Mt. This range does not include any negative emissions attributable to nature-based solutions, as land use estimates included in the model are not disaggregated to the provincial level.

Figure 2: Alberta’s GHGs Across Pathways to Net Zero



Note: Greenhouse gas emissions in 2050 do not include any reductions in emissions attributable to land use.

Negative emissions occur in scenarios where DAC is available, and DAC facilities operating in Alberta offset gross emissions in Alberta, along with positive emissions in other provinces. In contrast, the highest level of emissions occurs when DAC is unavailable, leaving primary reliance on advanced forms of CCUS. This is primarily from CCUS supporting ongoing production in the oil and gas sector, which results in emissions of between 14 and 23 Mt in 2050 (although reaching net zero emissions nationally means these amounts will be offset somewhere in Canada by negative emissions from nature-based solutions).⁸

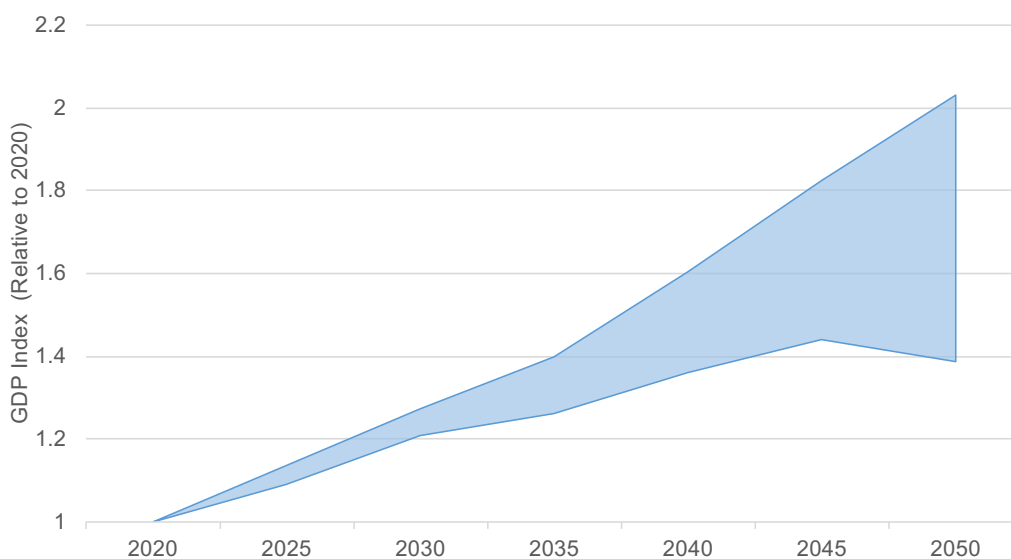
Last, the mid-range emissions correspond to scenarios where neither DAC nor advanced forms of CCUS are available. This is largely driven by a sharper contraction in oil and gas production, and correspondingly, lower emissions. It also highlights,

⁸ Negative emissions from nature-based solutions are only provided at a national level in the CICC analysis and cannot be attributed to a specific province. In practice, this exchange requires a functioning national offset market to facilitate negative emissions from nature-based solutions offsetting the remaining emissions from Alberta’s oil and gas sector.

however, that the availability of negative emissions technology may defer the adoption of lower- or zero-emissions technologies in other areas. For example, when negative emissions technologies are not available, there is a sharper decline in emissions in the transportation and building sectors. This is likely indicative of earlier widespread adoption of technologies such as electric vehicles and zero-emissions options for space heating.

Regardless of the path Alberta takes to achieve net zero emissions, the model suggests its economy will continue to grow, albeit at a slower rate than in the province's recent history. Chained GDP in 2050 is forecast to increase by 1.4 to 2.0 times relative to 2020, corresponding to an annualized growth rate of between 1.1 and 2.3 per cent (Figure 3). The upper end of the growth path corresponds to the Transition Pathway, in which the oil and gas sector and DAC (as a new industry) drive growth in the provincial economy. The lower range corresponds to the Transformation Pathway.

Figure 3: Alberta's Chained GDP, Indexed to 2020



A sharp contraction in Alberta's oil and gas sector drives the lower forecast growth rate for GDP in the Transformation Pathway. The oil and gas sector (including support services) accounted for approximately 28 per cent of Alberta's economy in 2019 (Statistics Canada n.d.). A contraction in the sector will be challenging, but historical data suggest that other current economic drivers can sustain a reasonable growth rate in the province's economy moving forward.⁹ The Transformation Pathway is also likely to accelerate economic growth and diversification opportunities in Alberta's non-oil-and-gas sectors. GDP growth along the pathway is driven by a mix of current sectors

⁹ From 2000 to 2019, chained GDP in Alberta's non-oil-and-gas sectors grew at an annualized rate of 2.3 per cent. Sectors contributing the largest amounts to this growth included real estate and rental and leasing, health care and social assistance, construction, and finance and insurance. Continued annualized growth at this rate in the province's non-oil and gas sectors will be more than sufficient for Alberta's chained GDP index to grow to 1.4 (relative to 2020) in 2050.

such as agriculture, services and light manufacturing, as well as emerging sectors with future potential such as hydrogen and biofuels production.¹⁰

The contribution of these sectors means that Alberta's low path for GDP growth still exceeds the minimum forecast for Canada. It is also worth remembering the gTech forecast of GDP growth along all paths is likely an underestimate (Lee and Beugin 2021). The model does not account for possible emergence of new sectors (for which economic data does not currently exist). Also lacking in the model (and in GDP) are many of the benefits — such as cleaner air and positive health impacts — that come with a net zero transition.

In the discussion that follows, we provide a closer look at the paths to net zero in the following key sectors: oil and gas, industrial (excluding oil and gas), electricity, buildings, and medium- and heavy-duty transportation. We do not include a discussion of personal transportation, as Alberta's path to net zero in this sector is similar to the national pathway (already discussed in the CICC Net Zero report).

OIL AND GAS

The future of Alberta's oil and gas sector along a path to net zero is primarily dependent on whether Alberta follows a Transformation or Transitions Pathway. Also key, however, is the oil price.¹¹ When the price of oil is low, then regardless of other assumptions, oil production sharply declines from its 2020 level of 3.5 million barrels per day (bpd) to approximately 500,000 bpd in 2035 (Figure 4). This is followed by a gentler decline over the next 15 years, with minimal oil production of 100,000 to 260,000 bpd continuing to persist in 2050. Conventional oil (including enhanced oil recovery) surpasses oil sands as the primary source of oil production by (approximately) 2035. By 2050 oil sands production is forecast to be less than 25,000 bpd while conventional oil production varies between approximately 80,000 and 230,000 bpd.

In comparison, when the oil price is high, availability of engineered negative emissions solutions is the primary determinant of the path for oil production. When available, DAC and/or advanced CCUS support continued growth in oil sands and conventional oil production over much of the next 30 years, with total production increasing to between 4.0 and 4.9 million bpd in 2050.¹² Also of note in these scenarios, however, is that further expansion of Alberta's oil production will require continued investment in the sector, which is conditional on expectations of future market conditions. As a

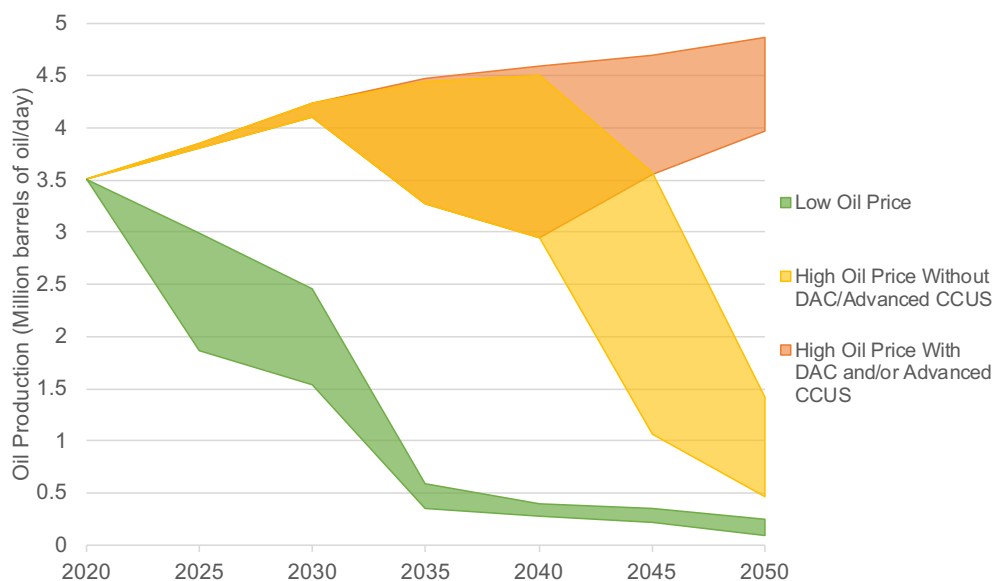
¹⁰ As identified in the CICC Net Zero report, additional sectors that may contribute to economic diversification and growth in Canada's oil-producing provinces are lithium and uranium mining, battery production, small modular reactors and geothermal energy.

¹¹ All oil prices are in 2020 US dollars. In 2020 the price of oil (per barrel) is assumed to be \$58 in the high oil price scenario and \$54 in the low oil price scenario. From there the two oil price paths diverge significantly. Along the low oil price path, prices from 2025 to 2050 range from \$39 to \$37 while along the high oil price path they range from \$63 to \$88.

¹² Along the path with high oil price and negative emissions solutions, oil production declines from 2030 to 2040 in scenarios where the rest of the world takes action on climate change and competitiveness measures are not in place.

result, forecast production along this pathway will only occur if oil companies and their lenders correctly anticipate this scenario unfolding, which implies and requires policy certainty and stability.

Figure 4: Alberta's Oil Production Under High and Low Global Oil Price Scenarios



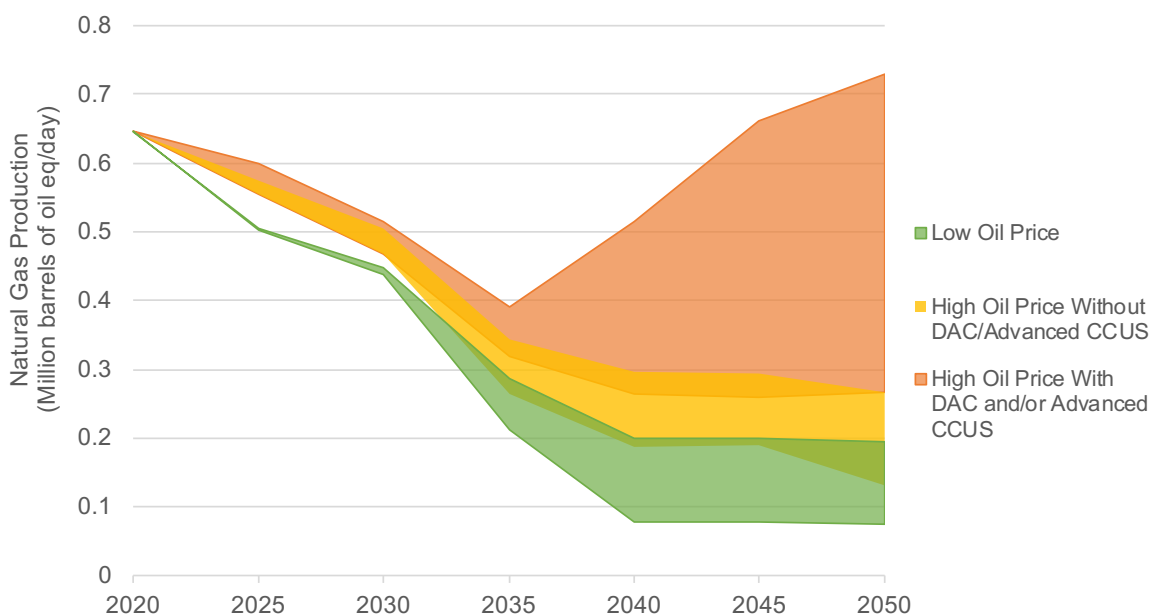
Note: The high oil price with DAC and/or Advanced CCUS pathway includes scenarios in which both DAC and advanced CCUS are available, and scenarios in which only advanced CCUS is available. There are no scenarios in which DAC is available and advanced CCUS is not.

When negative emissions solutions are not available, increases in oil production are only sustained to 2030 for the oil sands and 2040 for conventional oil. Between 2030 and 2040, continued oil sands production depends on the availability of second-generation biofuels.¹³ Specifically, when second generation biofuels are available, they support ongoing demand for conventional fuels in North America (e.g. under LCFS regulations) due to blending. In the absence of biofuel availability, there is likely to be a faster transition to electrification and hydrogen fuel, and correspondingly, a faster decline in oil sands production. Post-2040 the absence of negative emissions technologies leads to an unambiguous and sharp decline in oil sands and conventional oil production, with cumulative 2050 production between approximately 465,000 and 1.4 million bpd. With many current and planned oil sands projects having forecast production lives that extend beyond 2040, these pathways could result in significant stranded production assets.

¹³ Second-generation biofuels in the gTech model are fuels derived from feedstocks comprised of agricultural and forestry harvest residues. Agricultural residues are what is remaining of plants after harvest while forestry harvest residues include treetops and branches that are left by the road after logging (Navis Research 2021).

Similarly, the oil price and availability of engineered negative emissions solutions strongly influence natural gas production.¹⁴ The highest forecast production paths occur in the Transition Pathway and the lowest forecast production paths occur in the Transformation Pathway (Figure 5). Relative to oil production, however, there are some key differences. Across all scenarios, natural gas production is forecast to decline over the next 15 years, from 650,000 barrels of oil equivalent (boe) per day in 2020 to between 210,000 and 390,000 boe per day in 2035. This is consistent with other forecasts for Alberta’s natural gas production (Canada Energy Regulator 2019, n.d.; Alberta Energy Regulator 2020), which anticipate continuing declines in export (U.S.) demand.¹⁵ Most scenarios continue to see natural gas production decline, albeit at different rates, after 2035. The exception is in the Transition Pathway, with the highest production levels reached when the rest of the world is taking action on climate change and competitiveness measures are in place. This could be consistent with the U.S. (and other countries) adopting advanced CCUS and DAC technology, and Alberta’s natural gas producers being competitive in an international market where demand for natural gas (as a relatively less carbon intensive fossil fuel) is correspondingly increasing.

Figure 5: Alberta’s Natural Gas Production Under High and Low Global Oil Price Scenarios



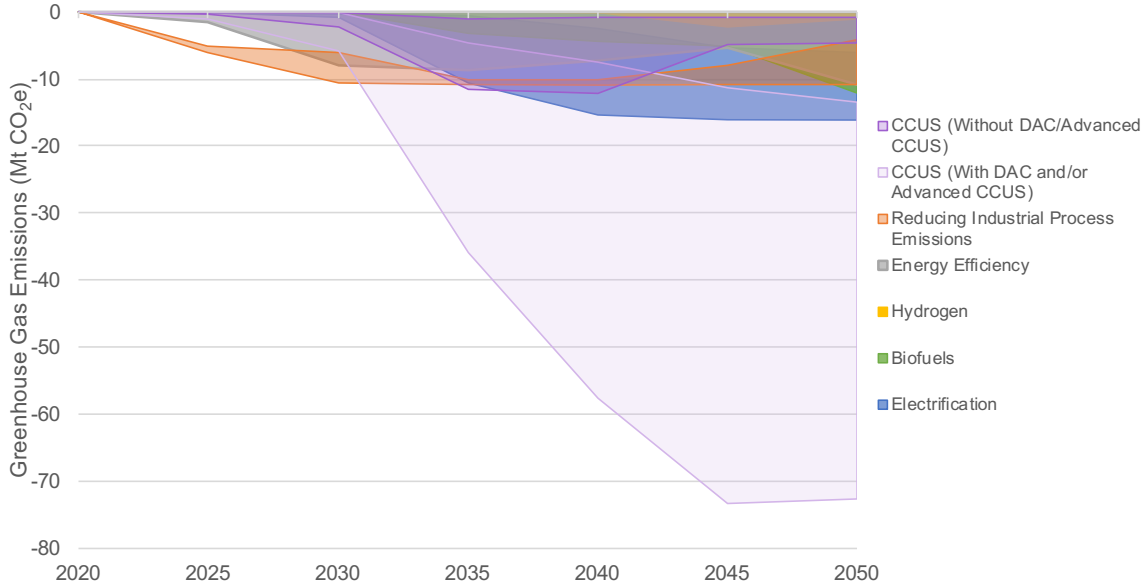
¹⁴ We refer to the oil price here as it is a key scenario assumption and an exogenous input to the gTech model. The natural gas price is determined endogenously, via a calibration of both oil and natural gas prices to the Canada Energy Regulator’s 2019 Energy Futures report (Canada Energy Regulator 2019; Navius Research 2021). Notably, there is significant overlap between the natural gas price ranges that correspond to the low and high oil price paths, with a small divergence in prices only starting in 2035. Along the high oil price path (all prices in 2020 US dollars per mMBTU), natural gas prices increase from \$3.50 in 2035 to \$4.60 in 2050. Along the low oil price path, they increase over this same period from \$3.50 to \$4.00.

¹⁵ As previously referenced in footnote 2, it is possible that a decline in U.S. export demand for Alberta natural gas is offset by rising demand for LNG exports in other international markets, but this scenario is excluded from our analysis. The CICC Net Zero report only includes scenarios where the global market follows trends in U.S. markets. That is, it does not include scenarios where U.S. demand for natural gas is down but global demand persists.

Turning briefly to the greenhouse gas reduction pathway for Alberta’s oil and gas sector, the primary contributor to emissions reductions in the sector is advanced CCUS, when it proves viable and cost-effective at scale (Figure 6). The full range of emissions reductions attributable to advanced CCUS is 12 to 72 Mt, with the highest reductions occurring in scenarios in which DAC is not available and the oil price is high. These scenarios are conducive to higher oil production, and in the absence of DAC, CCUS carries a larger amount of the emissions reduction load. Electrification also plays a larger role when DAC is not available, supporting emissions reductions of up to 16 Mt.

As discussed, when negative emissions solutions are not available then regardless of the oil price, the lack of options for emissions reductions consistent with net zero means that continued growth in oil and gas production cannot be sustained. The contraction in production accordingly limits the amount of emissions reductions that are required. Maximum emissions reductions in these scenarios are 44 Mt with electrification and reductions in industrial process emissions generally contributing the largest amounts.

Figure 6: Oil and Gas Sector GHG Reduction Pathways



Note: The oil and gas sector includes conventional oil production, oil sands production, natural gas production, natural gas transportation and petroleum refining. When advanced CCUS is not available, a limited amount of CCUS technology can be used to capture concentrated process (non-combustion) emissions only.

INDUSTRY EXCLUDING OIL AND GAS

Emission reduction options for Alberta’s other industrial sectors are similarly dominated by advanced CCUS, which offers reductions of 5 to 30 Mt by 2050 when available (Figure 7).¹⁶ As was the case with oil and gas, the availability of advanced

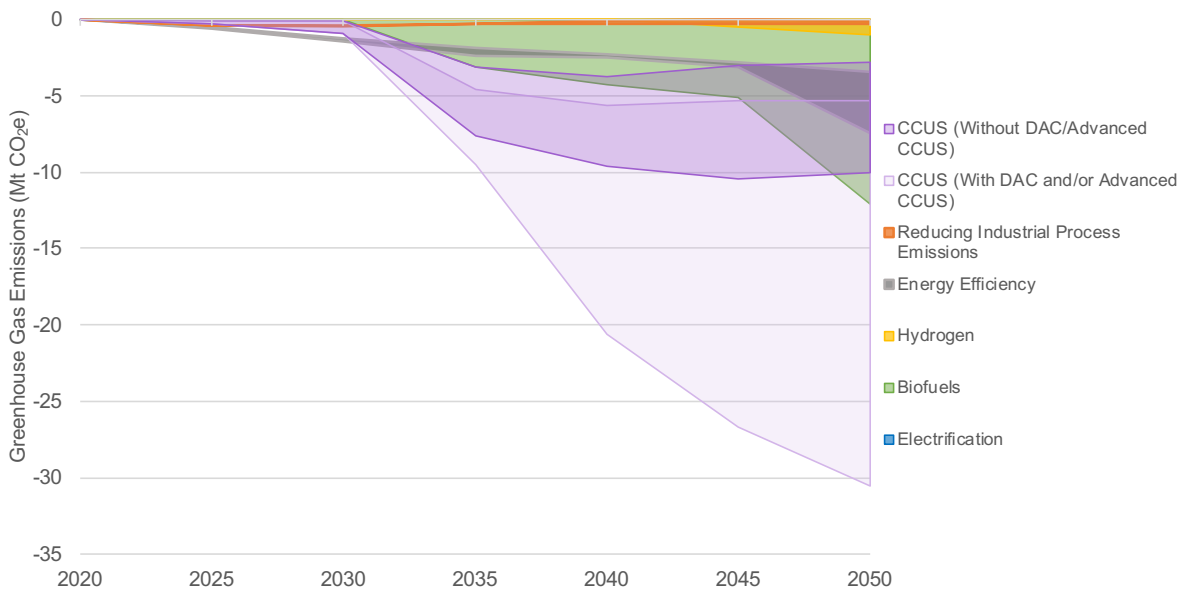
¹⁶ “Other industry” in the gTech model includes agriculture and forestry, biofuels manufacturing, cement and lime, DAC, hydrogen production, manufacturing, mining, and steel.

CCUS helps sustain ongoing production in other industrial sectors using existing production methods, which in turn results in a higher level of emissions requiring offset. Once again, the highest level of CCUS reductions occur when alternative options for reductions, most notably DAC, are not available.

While advanced CCUS provides the most potential for emissions reductions in Alberta’s industrial sectors, it is less critical to their ongoing growth. This is largely due to the fact that the starting level of emissions in these sectors is much smaller (41 Mt for other industry in 2019 as opposed to 141 Mt for oil and gas). Further, Alberta’s other industrial sectors — most notably fertilizer and chemicals production — have higher levels of process emissions, for which CCUS technology is available across all scenarios. Accordingly, when advanced forms of CCUS are not available, CCUS for process emissions still provides a consistent source of emissions reductions. These reductions start in 2030, and grow to reach annual reductions of between (approximately) 4 and 10 Mt by 2040. They largely stay within this range for the entirety of the 2040 to 2050 period.

Second generation biofuels, when available, are also an important source of emissions reductions in the absence of negative emissions solutions. Projected emissions reductions along the upper path for biofuels slowly grow from 2030 to 2045 (rising from 0 to 5 Mt), and then sharply kick up in the final five years, offering emissions reductions of up to 12 Mt in 2050. Last, offsets from nature-based solutions would be required for any remaining positive emissions in Alberta’s industrial sector (excluding oil and gas) when DAC and advanced CCUS are unavailable.

Figure 7: Industrial Sector GHG Reduction Pathways (excluding oil and gas)



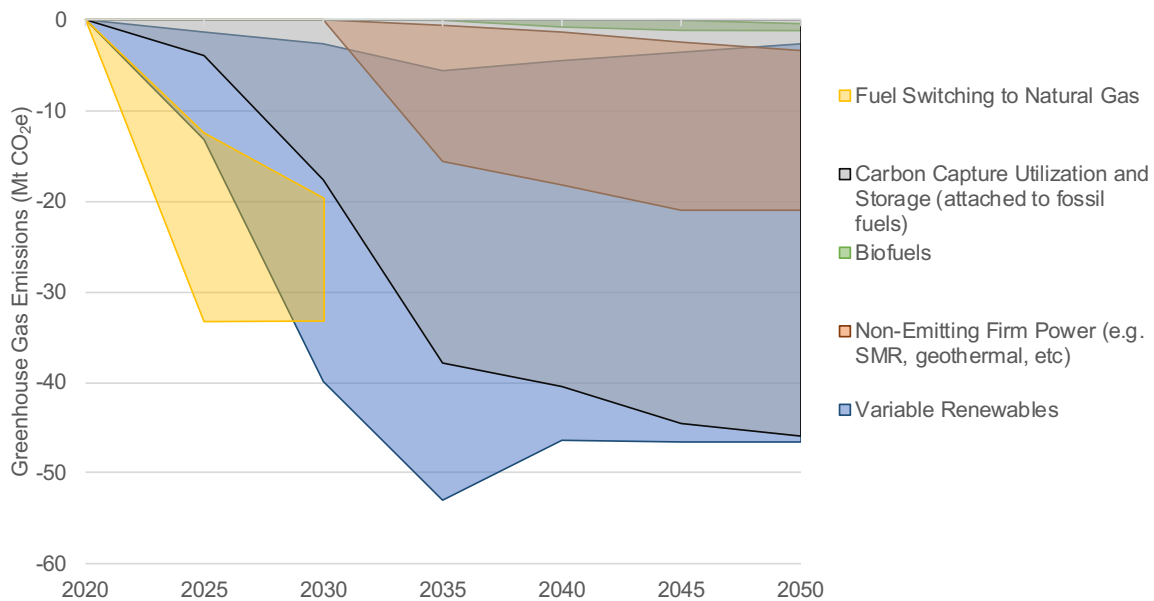
ELECTRICITY

While Alberta has been successful in achieving significant reductions in emissions from its electricity sector in recent years, most of this is the result of fuel switching from coal to natural gas. Alberta’s remaining coal plants are scheduled to switch to natural gas by 2023, achieving its coal phase-out seven years ahead of its original target of 2030 (The Canadian Press 2020). Despite this shift, Alberta will likely continue to be the most heavily reliant on fossil fuel thermal electricity generation among the provinces. Sources of emissions reductions in the electricity sector will correspondingly be highly dependent on whether it is in a Transition or Transformation Pathway.

When DAC and/or advanced CCUS are available, thermal generation continues though emissions reductions attributable to CCUS start to increase steeply beginning in 2025. In 2035 the maximum level of potential reductions reaches 38 Mt annually (Figure 8). From 2035 to 2050, CCUS continues to play a steady and rising role, contributing a maximum of 46 Mt of emissions reductions in 2050. This maximum level occurs in scenarios where new non-emitting firm power is not available.

In the absence of DAC or advanced CCUS, the emissions reduction path for the electricity sector is primarily dependent on the availability and cost of non-emitting firm power. When available and cost-effective, these technologies (e.g. flow batteries, impoundment hydro, geothermal, small modular reactors, power to hydrogen and back) are introduced in Alberta starting in 2030. Along their upper path, they provide emissions reductions of just over 21 Mt in 2050. In addition to the lack of advanced CCUS, this upper path is characterized by lower electric vehicle battery costs and lower hydrogen costs, both of which are likely to increase demand on Alberta’s electricity grid.

Figure 8: Electricity Generation GHG Reduction Pathways



Note: Attributed reductions to fuel switching fall to zero in 2030 as a result of the coal phase-out. That is, post-2030, fuel switching to natural gas (which itself has associated greenhouse gas emissions) is no longer credited as a source of greenhouse gas emissions reductions.

There is also a role for variable renewables in Alberta's future electricity grid, with their exact contribution largely determined by the availability and cost of DAC, advanced CCUS and non-emitting firm power. When these technologies are not available, the emissions reduction path for renewables increases steeply starting in 2020, reaching a maximum level of up to 53 Mt in 2035. Post-2035, the maximum emissions reductions attributable to renewables recedes slightly, reaching 47 Mt annually in 2040 (and remaining at this level through to 2050). In contrast, when DAC and advanced forms of CCUS are available and new non-emitting firm power is being built, emissions reductions attributable to renewables reach a maximum of less than 6 Mt annually over the entire 2020 to 2050 period.

Last, we note the gTech model does not allow for expansion of storage or electricity interties between regions, both of which may be key components of Alberta's electricity supply on a pathway to net zero. The Government of Canada announced support for intertie projects that connect regions dependent on fossil fuel electricity generation to those with abundant hydroelectricity supply (Environment and Climate Change Canada 2020b). Recent research also shows that if new Alberta-British Columbia interties are established and decarbonization levels for the electricity sector exceed 80 per cent then there is an economic case for British Columbia's Site C hydroelectric project (Dolter, Fellows, and Rivers 2020a, 2020b). New interties with British Columbia may also support greater investment in wind and solar power in Alberta as the dispatchability of firm hydroelectric power is a needed complement to the intermittency of renewables (Jaccard and Shaffer 2020).

BUILDINGS

Relative to the rest of the country, Alberta again faces a steeper path to net zero in the buildings sector due to a heavier reliance on fossil fuels — particularly natural gas — for energy use in buildings. In 2018, fossil fuel sources accounted for 75 per cent of energy use in Alberta's commercial, institutional and residential buildings, compared to the national average of 52 per cent (Natural Resources Canada n.d.). Provinces with lower fossil fuel energy use in buildings are those that currently have significant sources of hydroelectricity. Unsurprisingly then, the national shift towards net zero in the buildings sector is expected to be driven primarily by electrification.

While electrification will also play a role on Alberta's path to net zero in the buildings sector, there are several challenges specific to the province. Most significant is the current low share of zero-emissions electricity sources in the province. As a result, substantive emissions reductions attributable to electrification are not forecast to be available until 2030.¹⁷ From 2030 to 2035 emissions reductions from electrification are forecast to grow across all scenarios to between 1.5 and 3.2 Mt (Figure 9). Post-2035, the potential for emissions reduction from electrification diverges substantially. The lower emissions reduction path for electrification effectively stays flat, with 2050

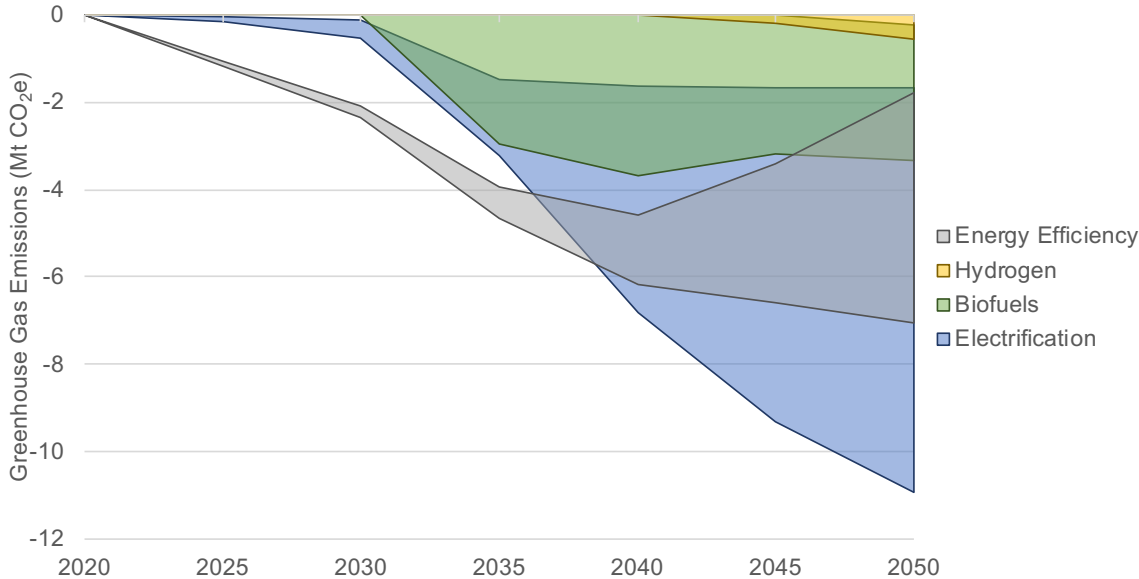
¹⁷

While 2030 is also the year in which new non-emitting firm power potentially becomes available, the availability of this technology does not have a significant impact on the emissions reduction pathway for electrification. Small-scale nuclear reactors are not included in the modelling, though were they to prove viable they could present new generation and economic opportunities in the province.

reductions remaining below 2 Mt. Along the upper path, in comparison, reductions grow steadily and reach as high as 11 Mt in 2050.

The highest level of emissions reductions from electrification corresponds to scenarios in which DAC, advanced CCUS and second generation biofuels are all unavailable. In opposite scenarios — where all three are available — emissions reductions from electrification track along the lower path, with both energy efficiency and biofuels providing greater emissions reductions instead. This likely occurs for a number of reasons. First, the main source of greenhouse gas emissions from buildings is space heating, with virtually all of Alberta’s commercial, institutional and residential space heating currently fueled by natural gas. A shift towards renewable natural gas (when available) or the use of negative emissions solutions therefore allows a larger share of current heating technology (some of which would not otherwise require replacement prior to 2050) to continue to operate without significant retrofits. Second, a shift to electrification will increase electricity demand, which in turn will require further build-up of zero-emissions electricity sources. Also of note is that emissions reductions from electrification in the buildings sector tend to be driven by the adoption of heat pumps. Heat pumps, however, require ambient humidity to optimally transfer heat and are therefore less effective in — and not as well suited to — Alberta’s drier climate. More investment in building shell efficiency, ground source heat pumps, RNG, and passive thermal systems is optimal in Alberta and Saskatchewan compared to other regions.

Figure 9: Buildings Sector GHG-Reduction Pathways



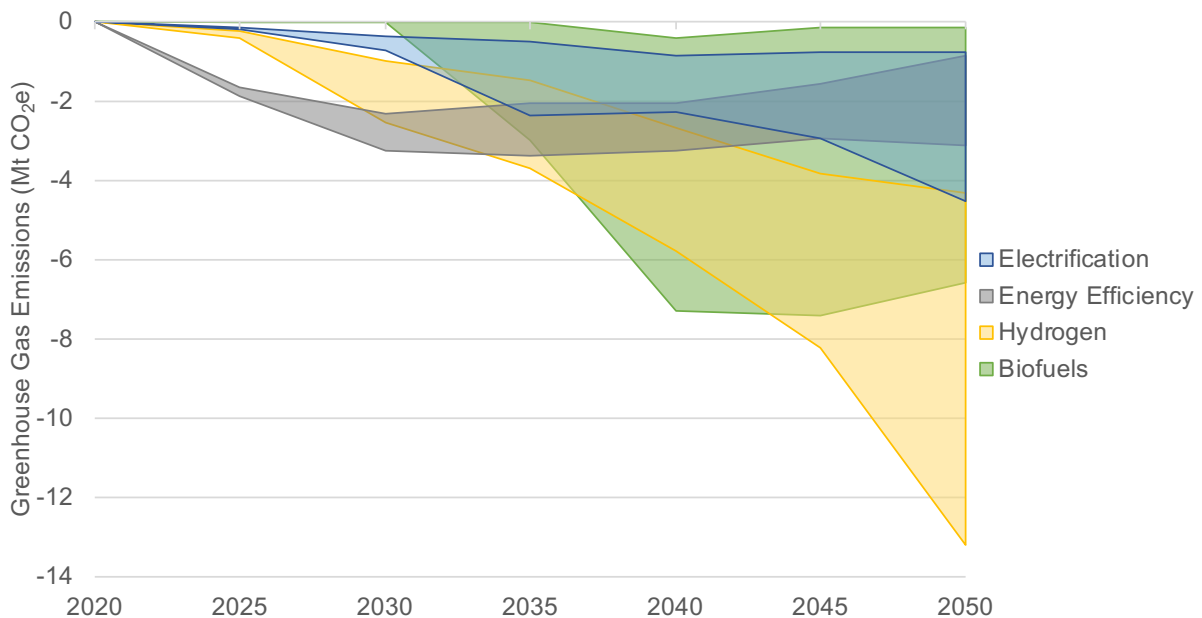
MEDIUM- AND HEAVY-DUTY TRANSPORTATION

Unlike the sectors discussed thus far, the emissions reduction pathway in Alberta’s medium- and heavy-duty transportation sector largely follows the rest of Canada. We offer a brief discussion, however, as there are a range of possible outcomes for the sector and government action is needed in the short-term to respond to this uncertainty.

The simulation results suggest that over the next ten years conventional vehicles will continue to comprise the bulk of Alberta’s freight transportation fleet. Accordingly, increased efficiency of internal combustion engines is the most likely source of emissions reductions over this period (Figure 10). Hydrogen will likely start contributing to emissions reductions as of 2025, with reductions of 1.0 to 2.5 Mt forecast by 2030.

Post 2030, there is a shift towards alternative fuels, with an unknown mix of hydrogen, biofuels and electrification likely delivering the largest emissions reductions. Given the current modelling assumptions, hydrogen has the most potential across all scenarios, with total forecast emissions reductions between 4 and 13 Mt in 2050. When second generation biofuels are available, their use increases steeply from 2030 to 2040, with maximum emissions reductions of over 7 Mt by 2040. Their contribution decreases slightly from 2040 to 2050, as a result of hydrogen and electrification being more cost-effective options. Last, electrification is forecast to deliver emissions reductions of between 1 and 4.5 Mt by 2050. Its exact pathway is, however, very sensitive to a number of highly uncertain scenario assumptions including the oil price, electric vehicle battery costs, the availability of second-generation biofuels and the availability of engineered forms of negative emissions solutions and advanced forms of CCUS.

Figure 10: GHG Reduction Pathways in Alberta’s Medium- and Heavy-Duty Transportation Sector



The split of emissions reductions across technologies suggests there is likely to be at least two – and potentially three or four – fueling technologies with significant market share in 2050. This will in part be driven by diversity within the sector, with different forms of transport facing different needs and constraints. For example, while electrification may become a feasible option for delivery vans and transit vehicles that stay within urban areas, it will likely face greater challenges as a solution for long-haul

freight. Also of note are the different fueling networks that will be required. While bioliquids can be administered through the province's current network for conventional gasoline and diesel fuel, the transition to hydrogen fuel cells and electrification will require establishing new hydrogen fueling and electric vehicle charging networks. It is therefore important for the government to take initial action now to support building both potential networks, with policy that is technology-agnostic.

OPPORTUNITIES FOR ALBERTA

There are four major opportunities for Alberta in its transition to net zero, drawing on the province's existing strengths. First is development and widespread use of negative emissions technologies: CCUS combined with DAC. Carbon dioxide reuse can occur in partially depleted oil and gas reservoirs for enhanced oil recovery, cement curing, hydrocarbon fuel- or feedstock-making, or other purposes. Dedicated underground disposal can take place in depleted oil and gas reservoirs, but deep saline aquifers, which typically underlay oil and gas bearing regions, are preferred for longevity and leakproofness. Carbon capture and storage costs are estimated at \$50-\$150 per tonne of CO₂e for combustion, and \$20-\$120 per tonne for non-combustion, not including CO₂ transport costs (Navius Research 2021).

DAC is a family of technologies that, like CCUS, takes known and commercialized chemical absorption and separation technologies and repurposes them to extract CO₂ from the air (which is mainly nitrogen) to compress and push underground for permanent geological storage using CCUS in disused oil and gas wells or deep saline aquifers. The key difference with DAC from waste- or post-combustion-CCUS is it starts with cleaner air at much lower concentrations. Depending on the process design, DAC requires significant quantities of energy and access to a geological reservoir. Once established, costs are currently estimated at \$100-\$300 per tonne CO₂e, with very high uncertainty. There are also institutional questions about how the large sums necessary to pay for DAC would be raised and dispersed.

The Western Canadian Sedimentary Basin is an ideal location for both CCUS and DAC. Developing these technologies in Alberta means the province could become a centre of low-emissions heavy industry using CCUS, and eventually a supplier of net-negative DAC and CCUS disposal credits to Canada and potentially the world — the ultimate additive, verifiable, permanent and traceable offset.¹⁸ Both CCUS and DAC are to a certain extent extrapolations of current engineering, and so are largely implementable with appropriate incentives and long-term policy signals (such as Canada's planned carbon tax increases), though significant investment is required. Moreover, the build-out of these technologies in Alberta takes advantage of existing human capital. These technologies would also allow for a more gradual transition of Alberta's economy and energy system, potentially even sustaining oil and gas production. The uncertainty with this opportunity lies in international demand for crude oil, willingness of other jurisdictions to pay Alberta for these offsets, and the presence of a global offset market (which currently does not exist).

¹⁸

Current offset markets are criticized as not being additive (true emissions reductions) and being unverifiable (Rivers, Harrison, and Jaccard 2021).

The second opportunity for Alberta is in hydrogen production, either blue hydrogen made from low-cost natural gas with CCUS, or green hydrogen manufactured through electrolysis. Hydrogen is a potential source fuel for heat, transportation and industrial use. While there is uncertainty about whether hydrogen will become a widespread heat and transportation energy source, its industrial use is nearly certain.

Alberta's third opportunity is in the refining and chemicals industry, again leveraging Alberta's pre-existing expertise and industrial infrastructure.¹⁹ Alberta could be a significant producer of net-zero high value fuels (e.g. synthetic net zero jet fuel, diesel; ethanol) and chemical feedstocks (e.g. hydrogen, ammonia, methane, methanol, ethanol, ethylene, BTX). The chemical feedstocks can be made from blue or green hydrogen, captured CO₂, gasified biomass, or direct-air-captured CO₂. Relatedly, Alberta could also be an important biofuels supplier.

Finally, there is a fourth opportunity for Alberta, masked as a challenge. Alberta's electricity grid has historically used mainly coal, and yet it has an accelerated coal phase-out by 2023. This phase-out has initially focused on a mix of natural gas, legacy hydro, wind and solar, but eventually natural gas will have only a load-following and firm-power-backup role. Alberta already has one of the most efficient deregulated markets in Canada and the world. If the province can look ahead, and use its electricity market development savvy to build new, efficient, and low cost internal markets for firm clean power on multiple time scales (seconds, minutes, hours, overnight, and seasonal) to supplement its very large and inexpensive variable wind and solar resources (Bakx 2021), it will be in a position to export this institutional knowledge to similar jurisdictions globally.

We note that these opportunities are unlikely to be fully realized without government intervention. Many paths lead to net zero, and each involves opportunities, trade-offs and risks. There is an important role for policy — from both the Government of Alberta and the federal government — in providing incentives for emissions reductions and technology investments that enable further GHG reductions and new economic opportunities. Government policy is particularly important in addressing externalities from innovation (where social net benefits exceed private returns on investment) and innovations' benefit stems from environmental goals rather than improving firms' bottom line (Fellows, Goodday, and Winter 2021). Policy also has an important role in resolving uncertainty regarding future energy systems and energy use, and will be key in determining whether Alberta is on the Transformation or Transitions Pathway, or somewhere in between.

CONCLUSION

Canada's net zero commitments and the transition to net zero emissions by 2050 will create challenges and opportunities across the country. Alberta, with its current economic focus on oil and gas production and processing, may seem at risk of

¹⁹ Alberta's Industrial Heartland is "Canada's largest hydrocarbon processing region" (Alberta's Industrial Heartland Association n.d.).

economic decline and becoming a “have not” province. However, the very features that make Alberta’s economy the most emissions-intensive at present could create major opportunities for Alberta in its net zero transition. Importantly, preparing for net zero in 2050 and making the most of Alberta’s opportunities will require policy change and policy action from all levels of government.

Notably, the scenario assumptions lead to significant differences in possible outcomes for Alberta. This highlights two key results. First is the role that provincial and federal policy decisions can play in influencing Alberta’s economic and emissions reduction pathways over the next 30 years. Second is recognition that certain key scenario assumptions are outside of government’s control. Most notable are the low oil price scenarios, which create an uncertain future for oil and gas both within the context of a net zero transition and outside of one. A conscious shift to net zero — accompanied by proactive planning and policy decisions — could help ensure the province increases its economic resiliency and diversity through pursuit of future opportunities.

The less disruptive Transition Pathway we describe above relies crucially on negative emissions technologies, described as “wild cards” rather than “safe bets” in the CICC Net Zero report. This high-risk, high-reward opportunity has a role for government in supporting commercialization of the technologies, as this is a clear case of social benefit exceeding private benefits concomitant with insufficient market signals for the private benefit. Continued oil and gas production in Alberta depends on global factors (the price of oil and international demand) and internal factors (emissions management), and the development and widespread deployment of these early stage technologies. Accordingly, reducing emissions from oil and gas will require substantial policy attention.

Responsible governments should also plan to ensure resilience across different possible futures.²⁰ The Transformation Pathway requires aggressive energy system change, and hence aggressive policy action. Current uncertainty about the form of future energy sources (electrification, hydrogen, biofuels) creates the potential for supply chain disruption and broader labour and economic dislocation if, for example, distribution networks are not built out quickly. More importantly, the Transformation Pathway articulates major changes in Alberta’s economy. To avoid unnecessary economic disruption, re-skilling programs and other labour market supports will be important government interventions. There may be valuable lessons from Alberta’s coal phase-out.

Alberta’s and Canada’s net zero transition will require substantial policy and economic changes, creating both disruption and opportunity. Failure to transition is a significant threat to Albertans’ prosperity and well-being. Future-thinking governments are necessary to ensure policy is in place to maximize new opportunities and minimize unnecessary disruption.

²⁰ A worst-case scenario would likely be *not planning* for the Transformation Pathway and betting (and losing) on the Transition Pathway.

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CHAPTER 10

DIVERSIFICATION OF THE ALBERTA ECONOMY: IN SEARCH OF STABILITY

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1. INTRODUCTION

Calls for economic diversification in Alberta have become a prominent feature of every significant downturn in the provincial economy and these have become louder in the current circumstance of the twin shocks of low oil prices and COVID-19. In late 2014 benchmark oil prices fell by approximately 50 per cent and remained at those levels until 2019. Then in early 2020, COVID-19 led to a further weakening of these prices which dealt an additional blow to employment and incomes across most sectors in the province. The result has been a very severe downturn in the economy¹ and, with the ever more stringent environmental and market access policies facing the key oil and gas sector, there are concerns that the longer-term prosperity of the province is seriously threatened.

These circumstances have intensified the calls for diversification, presumably to achieve greater stability. But it is typically unclear as to what exactly is meant by 'diversification', how it is measured, what its objectives are, how it is to be attained and the ultimate trade-offs and impacts. Nevertheless, there is broad public support for greater diversification during such periods² and this makes diversification policies politically very attractive. In most cases the attraction is based on promises of new or 'better' industries that will change the industrial structure of the region. The promise of new industries materializing may generate political support for such policies. However, the reality is that economic diversification is very complex and difficult to define and measure with the result that diversification strategies, like industrial development strategies, tend to be vague and difficult to put in operation.³

This paper begins with a summary of the key elements of effective diversification in the context of various types of economic instability faced by Alberta. While inherently difficult to measure given its many dimensions, some common measurement approaches are applied to assess the level and changes in diversification of the provincial economy. Attention is then turned to the degree, types and sources of economic volatility and, in this context, the potential role of greater diversification in stabilizing the economy is examined. Based on lessons from previous diversification attempts, some general policy guidance is proposed, along with other stabilization policies that warrant attention.

1

For example, the decline in Alberta's real (or inflation adjusted) GDP in 2020 was 8.2 per cent and compensation per employee fell by 6 per cent, by far the largest declines among the provinces. (Statistics Canada, Table 36-10-0222-01)

2

For example, with the collapse of oil prices in 2015 a poll found that two-thirds of those surveyed believed diversification away from oil and gas should be a priority (<https://www.cbc.ca/news/canada/calgary/poll-pembina-alberta-climate-change-1.3249966>). In a 1987 survey following the dramatic drop in oil prices in 1985 almost three-quarters of Albertans surveyed indicated a preference for greater diversification even if it led to incomes and employment that were lower but on average more stable. Mansell and Percy (1990, p.89).

3

Beauregard (1993, p.109) sums it up this way: "The romance with industrial diversification, however, should not be seen as a commitment to marriage. While diversification has much to offer, it is certainly not a panacea. Its goals are muddled, its rationale unsubstantiated, its consequences problematic, and its implementation doubtful. Nonetheless, industrial diversification seems to be unconditionally adopted and praised."

To summarize, by most measures, the Alberta economy has become much more industrially diversified over time than is commonly understood, especially in terms of employment and the diversity of goods and services produced. Currently the level of this diversification is fairly comparable to that in other benchmark provinces such as Ontario, Quebec and British Columbia. However, the province continues to exhibit higher levels of cyclical instability in incomes and value added or Gross Domestic Product (GDP) and, looking forward, there are concerns about secular instability related to long term challenges to the Alberta oil and gas sector.

There is a case for policies to encourage industrial development and growth to address the cyclical and secular instability. However, the more commonly proposed forced growth approaches targeting specific industries are often problematic, particularly given marginal success rates and the potential for large trade-offs resulting in lower productivity, incomes, exports and government revenues. Rather, a broad based approach is better suited and should be focused more on expanding the range of goods and services produced within the existing industrial structure and on market diversification. Further, it is noted that there are effective approaches other than industrial diversification to reduce variability. High on that list are policies to diversify the province's tax base and restore fiscal sustainability. Lastly, the potential secular instability associated with the challenges facing the province's oil and gas sector deserves special attention. This is the highest risk to Alberta's long term prosperity. The province has many strengths of adaptability and innovation developed through previous periods of adversity that will be critical in achieving a successful transition for this dominant sector. Strong leadership and consistent policies that anticipate and support the transition will also be particularly important.

2. WHAT IS DIVERSIFICATION?

The common objective of diversification in a regional economy is to reduce instability. In most cases the focus is on changing the industrial structure by adding new industries. The principle is similar to that used to stabilize a financial portfolio. In general, the variability of the portfolio will decline as the number of different company shares held increases, as the proportion of the most volatile shares decreases and as the amount of negative covariance increases (that is, where the prices of the individual company shares move in opposite directions).⁴ In the case of a regional economy consisting of a 'portfolio' of various industries, the degree of variability will therefore depend on the number of different industries, their relative size and volatility and the degree to which they move together or in opposite directions. As such, the diversification principle suggests the addition of industries exhibiting lower variability and industries which tend to exhibit negative covariance with the more volatile industries.⁵

⁴

As an approximation, with N individual units, each accounting for 1/N of the portfolio, the portfolio variance will be $(1/N) \times \text{Average Variance} + (1-1/N) \times \text{Average Covariance}$. As N increases, the portfolio variance approaches the average covariance.

⁵

An example is where the addition of a petrochemical industry using a natural gas based feedstock (primarily, ethane) helps offset the variability associated with the natural gas producing industry. For instance, in a period of low natural gas prices, the declines in the gas producing industry would be partially offset by the gains in the petrochemical industry as feedstock costs are reduced.

However, in the case of a regional economy these simple notions become much more complicated. First, there are different types and sources of volatility. This could be cyclical variability related to the frequent 'ups and downs' in commodity markets, especially those for internationally traded resource-based products, or related to less-frequent shifts associated with macroeconomic business cycles. In other cases the main concern could be random variability associated with largely unpredictable changes in such things as government policies, in trading relationships or the emergence of a pandemic. Finally, there is the case of secular instability associated with the long term decline of an industry or sector as a result of, for example, technological change, shifts in markets, or government policies that impair competitiveness. The key point here is that to be effective the type of diversification required will depend on the type of instability and, indeed, in many cases the best solutions will involve policies other than those aimed directly at diversification.

A second source of complications arises from the fact that there are different types of diversification. Most commonly, the focus is on diversity with respect to the industrial structure. However, stability is also related to diversity with respect to markets for existing industries, diversity in terms of the range of commodities produced by existing industries and / or the degree of processing of raw commodities in the region.⁶

A third complication arises from the fact that the degree of diversification will depend on which measure of well-being is used. For example, a region could be highly diversified in terms of employment but less so in terms of income or output.

For these (and other) reasons there is not a single definitive and meaningful measure of diversification and its relationship to regional economic stability.⁷ Rather, it is necessary to use a variety of indicators to capture the various dimensions and that is the approach taken here. A common measure used across dimensions is a Herfindal (H) index which indicates the degree of concentration in terms of industrial structure, markets, product mix and so on. For example, the normalized version, (denoted H*)⁸ for the distribution of employment in a region would have a value of one if all employment was in one sector and a value of zero if employment was equally distributed among all sectors. So, the lower the H-index the more diversified is the economy.

⁶

In general, higher levels of processing results in commodities that have less price and quantity volatility than the raw materials used as inputs.

⁷

Conroy (1975) provides a good summary of the complications in measuring diversification in a regional context.

⁸

The normalized H index, denoted H*, = $(H-1)/(1-1/N)$ where $H = \sum_{i=1}^N s_i^2$ and s_i^2 is the square of the share in sector i and where the sectors range from 1 to N .

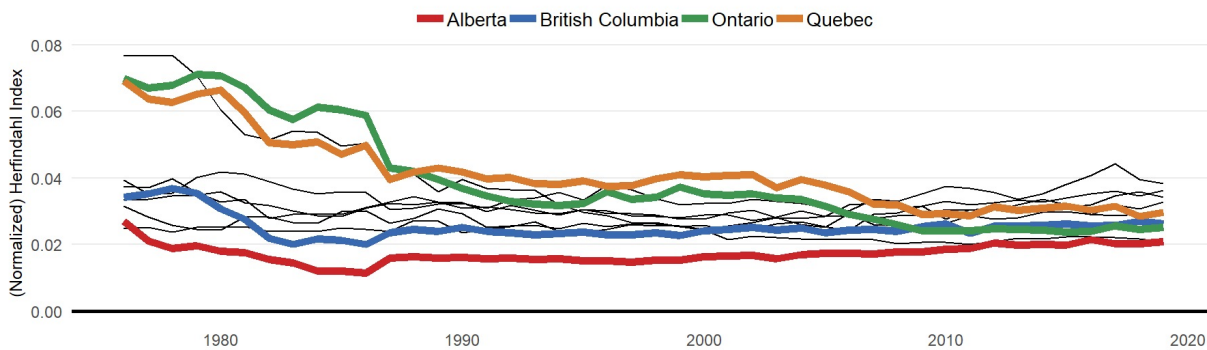
3. DIVERSIFICATION OF THE ALBERTA ECONOMY

The focus in this section is on changes over time in the level of diversification of the provincial economy and how this compares to that in other provinces. Values for the shares of employment and GDP by two-digit industry level over selected years in the period 2001-2020 for Alberta, British Columbia, Ontario and Quebec are provided in Appendix tables 1 and 2.

As indicated in Figure 1, as measured by the H*-index, over the past four decades or so direct employment concentration across industrial sectors in Alberta has tended to be below that in other provinces, and particularly relative to that in comparator provinces such as British Columbia, Ontario and Quebec.⁹

However, this does not take account of the covariance among sectors. For example, in the case of Alberta, there are extensive linkages among the oil and gas, construction, manufacturing and professional / technical Services sectors. As a result, employment in these latter sectors depends to a significant degree on oil and gas sector employment. To the extent that these move together (positive covariance), the result will be less diversification and greater cyclical variability. As indicated in Figure 2, taking these linkages into account results in a lower level of diversification (or higher level of concentration) but it is still at a level that compares favorably with most other provinces.¹⁰

Figure 1: H* Index of Direct Employment Concentration by Province, 1976-2019

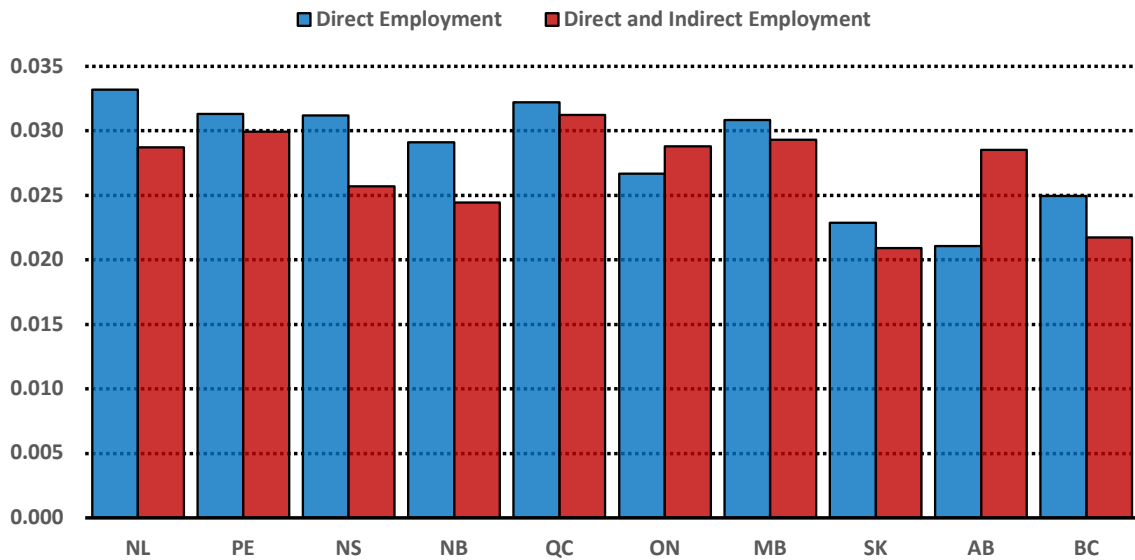


Source: Tombe (2020) based on data from Statistics Canada table 14-10-0023.

⁹ Indeed, other studies indicate that Alberta has one of the most diversified labour markets in North America. (Alberta Central, 2021).

¹⁰ See Tombe and Mansell (2016, section 2.6) for methodological details.

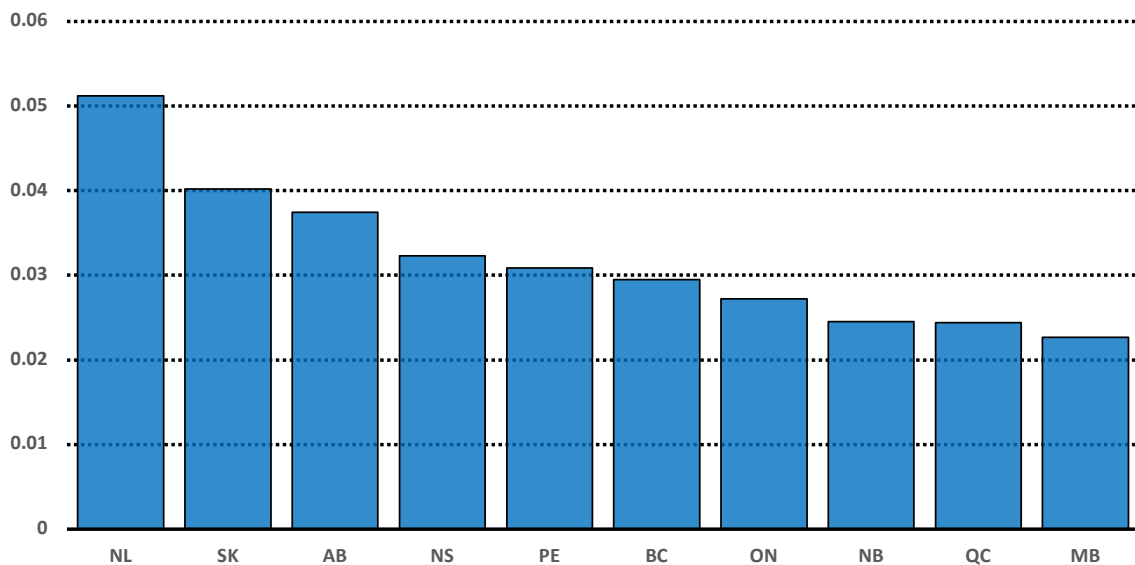
Figure 2: H* Index of Direct and Indirect Employment by Province, 2015



Source: Tombe and Mansell (2016, Figure 7).

However, as shown in Figure 3, the level of diversification for Alberta in terms of value added (or GDP) is significantly less than in most other provinces and particularly so in comparison to that for Ontario and Quebec. A key factor is the dominant contribution by the mining and oil and gas sector which directly accounts for over 25 per cent of total Alberta GDP in most years. (see Appendix Table 2).

Figure 3: H* Index of Nominal GDP by Province, 2015



Source: Tombe and Mansell (2016, Figure 8)

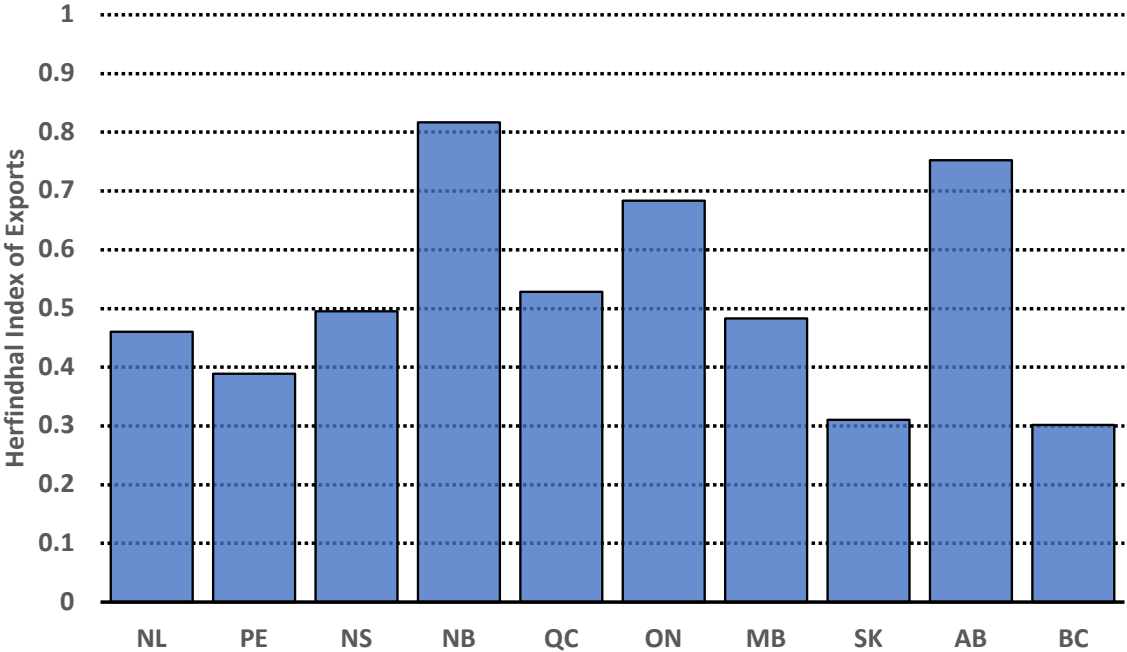
No equivalent summary measure of diversity with respect to the product range of existing industries is provided here. A survey of Statistics Canada data at the six-digit level (the highest level of disaggregation in the North American Industry Classification System (NAICS)) indicates that there has been a significant increase

in this diversity over time (in terms of employment and value added) in the case of Alberta.¹¹ However, without further detailed analysis it is not possible to compare this increase with the changes for other provinces.

The final dimension summarized here is with respect to the diversity of export markets. Using the H* index again, the approach is to measure the degree of diversity with respect to the province’s export markets. As before, a higher H* value indicates less diversity or greater market concentration. Using 2015 again as a representative year, the results shown in Figure 4 indicate a level of market concentration for Alberta well above that for most other provinces, primarily reflecting the very heavy reliance of the oil and gas sector on the U.S. market.¹²

By way of summary, the ranking of the level of diversification across provinces is shown in Table 1. Other than its high degree of diversification in terms of direct employment, Alberta ranks mid-pack when taking into account the indirect employment associated with each sector and it ranks poorly with respect to the sectoral diversity of nominal GDP and export markets. This suggests that, to the degree that greater diversification is aimed at reducing cyclical or random variability of the Alberta economy, the focus should be on two key elements: expanding and diversifying domestic and international export markets and pursuing policies consistent with offsetting the volatility of changes in GDP.

Figure 4: H* Index of Export Market Concentration, by Province, 2015



Source: Tombe and Mansell (2016, Figure 10)

¹¹ As just one example it can be noted that the main output of Alberta’s energy industry in the 1950s was conventional oil but over time it has added to its product range large components comprised of natural gas, gas liquids and unconventional (heavy and oil sands) oil. Similar trends can be observed for other basic or exporting sectors.

¹² For example, in January 2021 Alberta exports to the U.S. amounted to \$7.37 B compared to \$0.41 B to China, \$0.24 B to Japan, and \$0.12 B to Mexico. https://oec.world/en/profile/subnational_can/alberta

Table 1: Ranking of Diversification Dimensions Across Provinces

	Diversification Rank, by Province and Metric			
	Direct Employment	Direct and Indirect Employment	Nominal GDP	Export Markets
SK	2	1	9	2
BC	3	2	5	1
MB	7	8	1	5
AB	1	5	8	9
NB	6	3	3	10
QC	9	10	2	7
PE	5	9	6	3
ON	4	7	4	8
NS	8	4	7	6
NL	10	6	10	4

Source: Tombe and Mansell (2016, Table 4)

4. VARIABILITY OF THE ALBERTA ECONOMY

The dramatic impacts associated with the twin crises associated with energy prices and COVID-19 have unquestionably demonstrated the economic and social costs arising from volatility. But here it is important to distinguish among cyclical, random and secular instability. The large energy price shock initiated in 2014 is no doubt part of the cyclical variability seen many times before and it is this type of variability we initially focus on. The pandemic, on the other hand, is quite different. It is more of a ‘black swan’ event that is less predictable than variations in energy prices and typical variations among regions in terms of industrial structure would not alone make substantial differences to the impacts of the pandemic. In contrast, the increasing policy and market challenges facing the energy sector suggest a potential case of secular or long term instability associated with reduced investment and growth in a major driver of the overall economy.

The costs of variability will generally be smaller the greater the degree to which variations can be predicted or be reasonably anticipated. For example, in theory individuals, industries and governments subject to large income swings due to the vagaries of international commodity markets could take a longer term view with respect to commodity prices and avoid or minimize large swings in their expenditures over the cycle. However, this is often not the case given fleeting memories, the tendency to believe a current boom will be lasting rather than end in a bust, the short term focus of equity markets and the inherent propensities to chase rising markets.

It should also be noted at the outset that mathematically there will always be a tendency for greater variability the higher is the growth rate. This is particularly relevant to the case of Alberta which by most measures has tended to have the highest long term growth rates. For example, between 2001 and 2020 the population growth

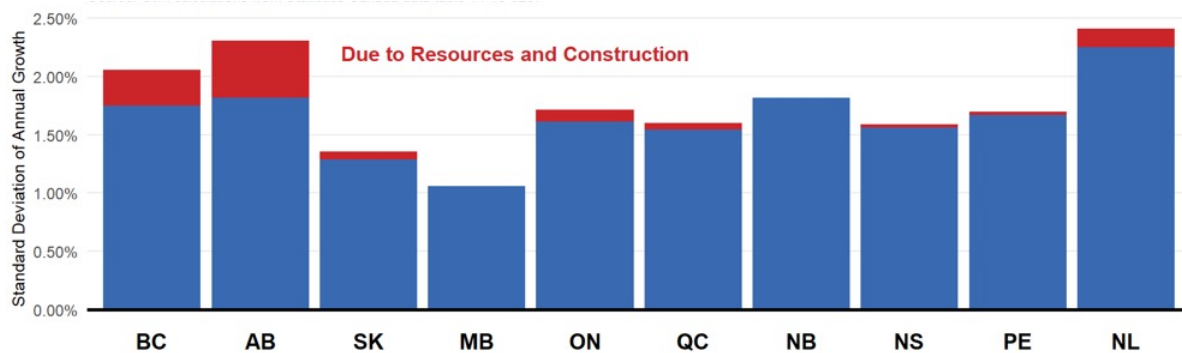
rate for Alberta was 2.2 per cent per annum¹³, 53 per cent above that for Ontario, and more than 100 per cent greater than that for Quebec and Manitoba, all provinces that have tended to have lower levels of variability.

CYCLICAL INSTABILITY

For the moment attention is on cyclical variability and the starting point is to measure the level of this volatility in terms of two broad measures, employment and GDP, that are critical in terms of economic and social well being. The variability of employment and GDP changes, measured as a standard deviation in annual growth rates, is portrayed in Figures 5 and 6 respectively.¹⁴

As shown in Figure 5, the variability of employment growth in Alberta over the period indicated has tended to be somewhat higher than in other provinces, with a substantial portion of this related to outsized variations in resource and construction industry employment in Alberta.¹⁵

Figure 5: Standard Deviation of Annual Employment Growth, by Province, 1976-2019



Source: Tombe, (2020, based on calculations from Statistics Canada table 14-10-0287)

However, the greatest variability for the province shows up in terms of GDP growth rates. As indicated in Figure 6, it is substantially above that in other provinces, except for Saskatchewan and Newfoundland and Labrador. There are a number of key sources of this variability. Using the income-based approach to measuring GDP, the net corporate operating surplus (or return on investments) exhibits wide swings in Alberta, largely in relation to the energy sector. For example, the swing in this component between 2014 and 2016 was from \$78.6 billion to \$15.7 billion.¹⁶ Using the

¹³ Measured as the annual compound growth rate over this period.

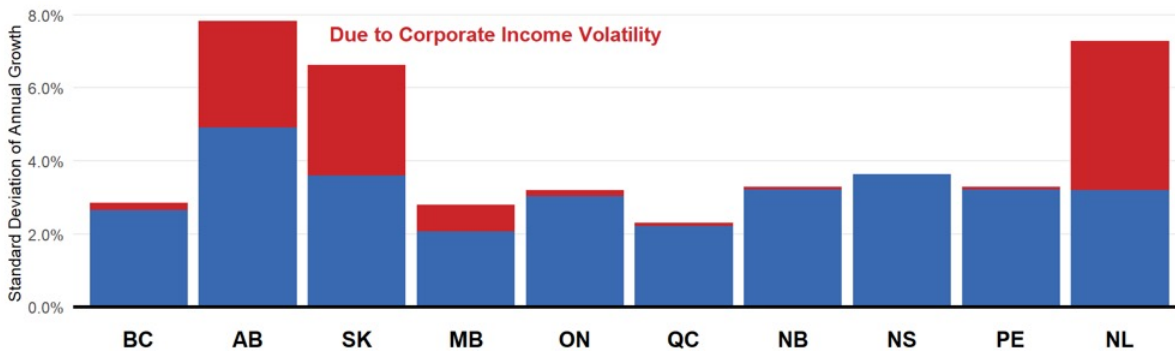
¹⁴ The standard deviation is a measure of the dispersion of a set of values around the mean of those averages. The standard deviation (σ) is the square root of the sum of the squared deviations of values for x (x_i) from the mean (μ) divided by the number of observations (N). That is, $\sigma = [\sum(x_i - \mu)^2 / N]^{1/2}$

¹⁵ As noted by Mansell and Percy (1990) and Chambers (1999), this variability for Alberta was particularly high during the 1976 - 1987 period, primarily the result of federal energy policies combined with swings in international oil prices. Also, see Kneebone and Gres (2013) for an analysis of regional employment cycles relative to those at the national level.

¹⁶ Data from Statistics Canada, Table 36-10-0221-01.

expenditure approach,¹⁷ the largest volatility is in the value of exports and in investment expenditures. The large fluctuations in energy prices directly produce substantial variations in the value of Alberta exports, one of the key drivers of the provincial (and the national) economy. Further, given the very high capital intensity of the energy sector, non-residential investment is also very large¹⁸ and, given its sensitivity to swings in expectations associated with energy pricing and policies, this adds further volatility to the province's GDP.

Figure 6: Standard Deviation of Nominal GDP Growth, by Province, 1981-2019



Source: Tombe, (2020, based on calculations from Statistics Canada table 36-10-0222)

Another way of unpacking the sources of instability involves decomposing a regional economic instability index.¹⁹ Using this approach, Dahlby and Khanal (2018, p.8) found that over the period 1997- 2015 Alberta's GDP volatility was much higher than that of Ontario, Quebec, and British Columbia primarily because of the greater variability in the construction, oil and gas extraction and manufacturing industries and in support activities for oil and gas extraction. At the same time, however, they found that shifts in the industrial composition of the Alberta economy over the period 1997-2015 reduced output volatility by 21 per cent.²⁰ These authors also examined the industrial composition of the variations in labour income, a more important concern of policy makers. For the period 1997-2014 they found that the construction sector had the most volatile labour income, followed by the oil and gas extraction sector and the manufacturing sector.

SECULAR INSTABILITY

The shifts in the Atlantic regional economies in the early 1900s are perhaps the most dramatic examples of secular instability in Canada. A combination of events, including

¹⁷ Using this approach, GDP = Consumer expenditures + Investment expenditures + Government expenditures (on goods and services) + Exports - Imports.

¹⁸ For example, in 2009, 2015 and 2019, non-residential investment in Alberta accounted for, respectively, 30 per cent, 33 per cent and 25 per cent of total non-residential investment in Canada. Data from Statistics Canada, table 36-10-0222-01.

¹⁹ See Mansell and Percy (1990, p.69).

²⁰ Dahlby and Khanal (2018, p.10). The comparable reductions for Quebec and Ontario were, respectively, 42.5 per cent and 34.5 per cent.

the phasing out of wooden ships, the shifting of international trade routes with the opening of the Panama Canal, the shrinking of traditional fish markets, and the declines in the demand for Maritime-sourced coal and steel struck serious blows to these economies. Arguably they have never fully recovered and this highlights the immense costs of secular instability.

While there have been cases of secular instability at a local level in Alberta, there have been none for the province overall. However, there have been instances of significant concern, particularly in relation to the energy sector. In the early 1970s and into the 1980s there were concerns that production from the province's pivotal oil and gas sector would begin a secular decline and that there was perhaps only a decade to diversify. In response Premier Lougheed (1974), emphasized the need for a diversification strategy to "become less dependent on the sale of unprocessed resources." This led to a number of diversification initiatives (noted later), including the formation of the visionary Alberta Heritage Savings Trust Fund to save for the future, strengthen or diversify the economy and improve the quality of life of Albertans.

As it turned out, the development and implementation of new technologies resulted in dramatic increases in oil sands production along with uplifts to conventional crude oil, natural gas and gas liquids production. This greatly reduced the urgency to address any future declines in the contributions of the oil and gas sector, and those of the linked industries, to Alberta's future prosperity. However, there are now growing environmental, policy and market issues around oil and gas that represent huge challenges to its contributions to Alberta's long term growth and prosperity.

5. DEALING WITH INSTABILITY

TRADE-OFFS

Any discussion of instability must be in the broader context of the province's overall performance. Alberta has an enviable record in terms of most measures of economic and social well-being of its residents. For example, Uguccioni, Sharp and Beard (2017, p.33) indicate that over the period 2000-2015 Alberta ranks first in terms of the Human Development Index²¹ among all Canadian provinces and fifth in the world. The province has also tended to have the highest output and income per worker and per capita and the lowest poverty rates.²²

Much of this success can be traced to the resources sector and particularly the energy industry (Mansell and Staples, 2011). In general, the resource industries tend to be characterized by capital and technology-intensive production processes, a large number of independent units, a high degree of risk and entrepreneurial awareness, considerable backward and forward linkages to other sectors, and wide exposure to the vagaries of international markets and government policies. Taken together, these

²¹ This international measure takes into account factors such as life expectancy, education, and per capita incomes.

²² See Kneebone and Wilkins (2021).

characteristics have created a very entrepreneurial, flexible and mobile population with strong incentives and abilities to respond to adversity by modifying existing activities and creating new ones. (Cross, 2021 and Mansell and Percy, 1990, p.57).

This adjustability in the broader real-world environment with rapid changes and volatility represents a very important strength of Alberta's economic base. It also highlights the fact that an industrial development policy aimed at replacing the more variable sectors with less variable ones can involve large trade-offs. These include a lower overall level of productivity, a less competitive industrial structure (particularly in a rapidly changing and volatile environment), and a diminished level of economic and social well being.²³ Further issues arise given the large size and highly integrated structure of the energy sector and its critical role (along that of agriculture and other resource sectors) in the economic base of many communities across the province. Simply put, there are no industry alternatives of sufficient size, productivity, export and government revenue generation capability, regional impacts and competitiveness that could realistically offset the negative impacts on the Alberta economy associated with a rapid and substantial decline in this sector.

ELEMENTS OF A SOLUTION

These trade-offs do not deny the fact that reduced variability of the Alberta economy would represent a real gain so long as the solutions would not entail significant reductions in overall economic and social well being. But diversification is not a panacea in achieving greater stability. Rather, there are approaches other than a forced re-engineering of Alberta's economic base that must also be considered in the search for greater stability.²⁴

Random Instability

Industrial diversification is not generally an effective strategy for truly random instability such as that associated with the pandemic. However, as noted by Cl  roux (2020), diversification in the form of expanding the range of products and markets for existing industries and firms is a viable risk mitigation strategy for the province. This, along with having appropriate risk management systems in place (including access to technologies to allow market pivots) and sufficient federal and provincial fiscal flexibility and capacity to provide short term income supports to assist individuals and businesses to 'weather the storm', are essential.²⁵ The enormous increase in federal expenditures has certainly been important in cushioning the impacts of the COVID-19

²³

Labour productivity and compensation in Alberta's energy and related industries is multiples above the average for most other industries in the province and in Canada. For example in 2020 per hour labour productivity (in chained 2012\$) for conventional oil and gas extraction was \$341.7 and it was \$1323.3 for non-conventional oil extraction, \$935.2 for petroleum refineries and \$672.2 for basic chemical manufacturing, compared to an average of \$84.5 for all industries in the province. (Data from Statistics Canada, Table 36-10-0480-01).

²⁴

See chapter 5 of Mansell and Percy (1990) for a detailed discussion.

²⁵

The Alberta government alone has committed just under \$9 billion as part of its support and economic recovery program.

pandemic. While the longer term macro and regional effects of the resulting expansion in federal debt are certainly a concern, the run up in Alberta's debt is more problematic given the province's pre-existing and significant long term fiscal gap (Tombe, 2021 and Crisan and McKenzie, 2021). Unlike the case at the federal level where deficits can be financed by 'printing money', at the provincial level there are definite debt walls and immediate negative consequences when they are approached (Ascah, 2021). This brings us to the issue of Alberta's fiscal situation and, in particular, the problem of revenue instability.

Mitigating Cyclical Variability – Fiscal Stabilization

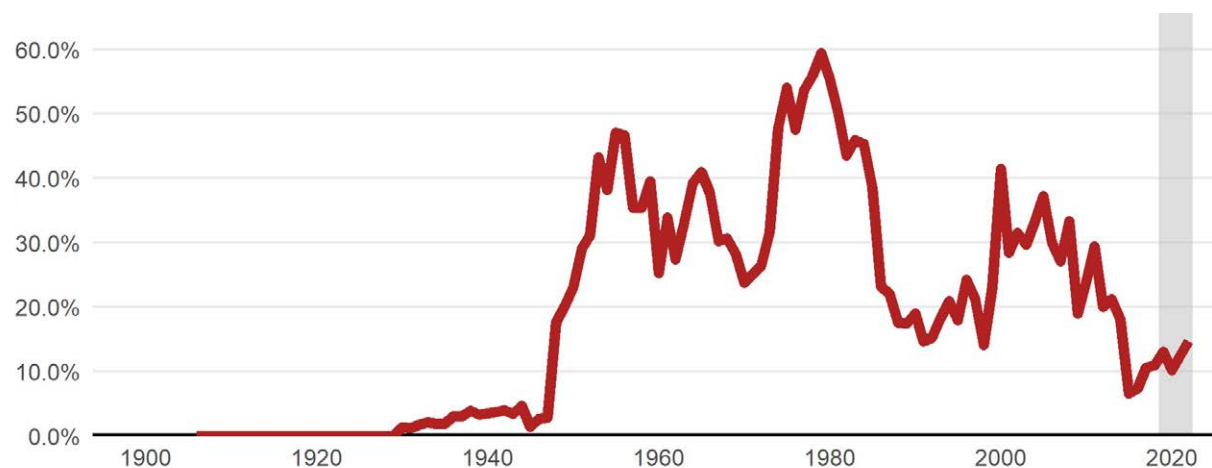
Alberta, along with Saskatchewan and Newfoundland and Labrador, suffers by far the greatest instability in provincial government revenue (Dahlby, 2019) and this has important implications for their governments in dealing with cyclical variability. This instability is primarily a result of the non-renewable resource revenues that comprise a substantial portion of the provincial government's revenues and swing widely with the ups and downs of oil and gas prices. As indicated in Figure 7, this share of Alberta revenues over the last two decades has ranged from over 40 per cent to under 10 per cent. While the running of fiscal surpluses and deficits has provided a buffer, there are still significant consequences for overall economic stability.

As noted by Crisan and McKenzie (2021, Figure 1) a result has been the tendency for the provincial government to overspend in periods of fiscal bounty, followed by periods of painful retrenchment.²⁶ Given that almost a quarter of total Alberta employment is in education, health care, social assistance and public administration, all sectors heavily dependent on provincial funding (see Appendix Table 2), this alone transmits significant volatility in addition to that associated with changes in other revenue and expenditure components. Further, it reduces the ability of the government to more aggressively pursue a fiscal stabilization policy involving, for example, large increases in infrastructure and other capital expenditures during downturns in the provincial economy. And, it also reduces the ability of the province to provide stable, attractive and predictable tax policies, along with high quality physical and social infrastructure. These factors are particularly important in attracting investment, employment and income growth.

²⁶

See also Mansell (1997).

Figure 7: Non-Renewable Resource Revenues as a Share of Total Alberta Government Revenues, 1905-2020.



Source: Tombe, (2020).

It should be noted that restoring fiscal stability and sustainability is widely seen by the business community as the highest priority for maintaining and growing employment and incomes in Alberta. (Kobly, 2021).

A sensible way of converting an unstable stream of resource revenues into a more stable flow of interest and dividend income is through a sovereign fund. Indeed, this, and the desire to save for the future, was the motivation for the Alberta Heritage Savings Trust Fund (AHSTF), as well as other similar funds such as the Alaska Permanent Fund and the Government Pension Fund Global of Norway (or Oil Fund). By investing a portion of resource revenues in a financial portfolio diversified across industries and regions, the Oil Fund has, since 1996, grown to almost \$1.6 trillion (Cdn) and the Alaska Permanent Fund (APF) has, since 1976, grown to over \$97 billion (Cdn).²⁷ In contrast the AHSTF, also established in 1976, had a value of \$17.3 billion at the end of 2020.²⁸ Unlike the APF and Oil Fund, the AHSTF did not and does not have the type of constitutional or pension plan protection to counter the propensity to spend rather than save and benefit from compound growth in interest and dividend revenues. As a result it has been politically attractive to significantly reduce the original non-renewable revenue investment commitments (to zero in many years), and to use it to fund capital projects and operating expenditures.²⁹ It is interesting to contemplate how different Alberta's economic future would look if the fund was, say, \$100 billion and able to realistically

²⁷ Data from: <https://www.nbim.no/> and <https://apfc.org/>

²⁸ Data from: <https://www.alberta.ca/heritage-savings-trust-fund.aspx#jumplinks-0>

²⁹ See <https://open.alberta.ca/dataset/80ee4142-17f2-4bc7-b30b-18afd3dfe5c8/resource/1c95d123-fald-49e3-ad25-98599aba2fb4/download/heritage-fund-historical-timeline.pdf> for a historical timeline of the AHSTF.

generate a fairly stable average of \$7 or \$8 billion per year in revenue.³⁰ Rather than a lament of the lost opportunity, the main point here is that it can serve as a useful lesson going forward. It is reasonable to expect resource revenues will remain substantial, and highly variable, for the foreseeable future. As emphasized by Smith (2021), a re-dedication to consistently saving a larger share of these revenues in a protected AHSTF would be one option in the context of much-needed fiscal restructuring to stabilize and enhance the sustainability of provincial government revenues.

Additional stability could be obtained by broadening the provincial tax base. Other papers in this series discuss this issue (see Tombe, 2021 and Crisan and McKenzie, 2021). A common prescription from an efficiency and stability perspective is the introduction of a sales (or value-added) tax. Unfortunately, in the case of Alberta this is difficult politically given that the absence of a sales tax is seen almost as a 'birth right'. Another option may be the repatriation of the federal carbon tax (which has many of the efficiency characteristics of a sales tax) and the use of some of the associated revenues to supplement the existing tax base.

One of the common requirements of a well-functioning federation is the provision of economic stabilization to allow regions to specialize in areas of comparative advantage without the added risks of doing so. As noted by Kneebone and McKenzie (1998), federal stabilization has primarily been through expenditure and transfer policies. For example, via automatic or discretionary federal fiscal adjustments a net stimulus can be provided to offset the effects of a sharp regional downturn. As outlined by Mansell, Khanal and Tombe (2020), over the period 1961-2018, these types of adjustments have played a significant role in stabilizing incomes in most provincial economies but not in the case of Alberta. In general, the net federal fiscal balance for the province (the difference between the total federal revenues collected in the province and the total federal expenditures and transfers returning to the province) has represented a large net outflow from the province and it has not been particularly responsive to downturns in Alberta's economy. This net outflow from Alberta associated with federal fiscal programs and policies has averaged more than \$20 billion annually and amounts to an annual transfer of over \$5000 per person. This is by far the highest in Canada, representing an annual transfer out of the province equal to about 10 per cent of total personal incomes in Alberta.³¹ These large transfers of income (and associated employment and population) become a substantial drag on the provincial economy during downturns and work against stabilization. Even modest changes, such as a

³⁰ The 2008 Financial Investment and Planning Advisory Commission's report on Alberta's savings and investment strategy recommended investing a legislated share of the non-renewable revenues with a target for the Alberta Heritage Fund of \$100 billion by 2030. See: <https://www.alberta.ca/release.cfm?xID=24786B1AE3659-F3BF-39F1-519A63FOE373A3EE>. Bremer and Ploeg (2014) have estimated that to achieve an on-going resource dividend equivalent to 30 per cent of government revenue the AHSTF would need to be worth the equivalent of 40 per cent of Alberta GDP by 2030 and 100 per cent by 2050.

³¹ This is roughly 3.5 times the net per capita federal fiscal contribution by Ontario, the only other major net federal fiscal contributor in Canada. Since 2000, the per capita federal fiscal balance for Ontario has ranged from a net per capita outflow of just over \$4000 to a net inflow of just under \$1000 per capita. The total net federal fiscal transfer out of Alberta over the period 1961-2018 amounted to \$631 billion. See Mansell, Khanal and Tombe, (2020). With the net transfer for 2019 added, the total comes to \$661 billion (in 2019\$).

re-balancing of federal procurement so that Alberta receives something closer to the per capita share for other provinces, would significantly reduce this drag on the economy.³²

The federal fiscal stabilization program is intended to provide insurance to provinces in cases of dramatic drops in their own-source revenues and could be of considerable assistance in stabilizing Alberta's revenues. However, as explained by Dahlby (2019), it is designed to minimize the protection against large revenue declines for the provinces with heavy reliance on resource revenues (Alberta, Saskatchewan and Newfoundland and Labrador).³³ Unfortunately these are the provinces in greatest need for revenue stabilization. In the case of Alberta, for instance, revenues dropped by \$8.8 billion in 2015-16 (roughly 20 per cent) and it received \$248.3 million under the stabilization program. Over the period 1986-2018 there have been two instances of 25 and 34 per cent declines and four years with declines of more than nine per cent. Based on standard insurance principles, Dahlby estimates that the province should have received an additional \$7 billion to \$11 billion in revenue stabilization over this period (Dahlby 2019, p.11). While the formula was changed recently by the federal government this was limited to raising the cap from \$60 to \$170 per resident to reflect inflation over time but did not address the discriminatory 50 per cent deductible for resource revenues. The net result is an increase in the expected payment to Alberta to \$750 million and with the main benefits going to the provinces that are not significantly dependent on resource revenues.³⁴

All of the types of fiscal restructuring in Alberta and those involving changes to federal fiscal policies discussed above would significantly reduce the cyclical variability of the provincial economy. The huge challenge is achieving the sustained political leadership and support to make these changes a reality in a democratically unbalanced federation.³⁵

Mitigating Cyclical Variability – Diversification

As noted earlier, the Alberta economy has become more diversified over time and this has reduced cyclical variability. This has been due to both market-induced changes, particularly involving innovation, as well as policy-induced changes. At the provincial level there have been numerous policy statements and strategies since the 1970s which have invariably included diversification objectives, typically captured within a broader 'industrial development' strategy.³⁶ The most recent (Government of Alberta, 2020) is the recovery plan to create jobs, build and diversify. It includes strategies to drive diversification in relation to agriculture, forestry, tourism, technology and innovation, finance and fintech, creative industries, natural gas and petrochemicals.

³² This change alone for federal non-defense and defense procurement would reduce the net annual outflow by over \$3 billion. See Mansell, Khanal and Tombe (2020, Table 7). See also, Alberta (2020).

³³ The very low coverage for these provinces results from changes in the program over time that included a deductible of 50 per cent for resource revenues, a deductible of five per cent for non-resource revenues and a cap of \$60 per capita in payments to the provincial government.

³⁴ See <https://www.cbc.ca/news/politics/pbo-fiscal-stabilization-reform-1.5880714>

³⁵ Savoie (2019) provides a comprehensive analysis of these fundamental issues.

³⁶ For example, see: Government of Alberta (1984, 2011 and 2020).

The overall quantitative impact of the earlier policies and strategies on cyclical stabilization and other objectives has yet to be estimated.³⁷ However, much can be learned from case studies of both the successes and failures and these lessons should be applied going forward.

The most studied cases have involved examples of 'forced growth' where government-led initiatives using public funding, along with private funding, target and subsidize specific industries for development in a region. Some of the classic, earlier examples of this approach used across Canada, along with details on why they failed, can be found in Mathias (1971).³⁸ More recent cases of the forced growth approach in Alberta are summarized in Puscoi (2013) and Morton and McDonald (2015). These highlight the successes (such as Syncrude, the Alberta Energy Company, the Ethane-based Petrochemical Industry, the Canadian Western Bank and Pacific Western Airlines/WestJet), along with a dozen or so failures. In general, the successes have avoided the problems of the earlier Canadian experience but in addition they have tended to be rooted in some clear comparative advantage related to Alberta's strengths such as natural resources, the existing industrial base, access to markets, entrepreneurial skill, innovation or scale-up economies. Further, they could demonstrate long-run financial viability and sustainability in the province under a range of realistic future scenarios and there was one or more clear market imperfections justifying government intervention.³⁹ It is also noteworthy that the successful diversification policies have not been focused on promoting industries or sectors based on their cyclical stability or negative covariance with the existing economic base. Indeed, such a singular focus is unrealistic.

While there are certainly cases where a forced growth approach is appropriate for advancing diversification aimed at greater stability, experience suggests that a broader approach should be the dominant one. This 'shot gun', market-based approach does not focus on trying to re-engineer the industrial structure or economic base, something which is extremely complex, interconnected and subject to rather gradual evolution over time. Rather, it emphasizes product diversification (expanding the range of products) over many industries, growing and diversifying markets for Alberta goods

³⁷ Given the combination of differing policies and objectives typically embodied in these industrial development strategies it is difficult to separate out and estimate the independent effects on diversification. To do so requires the use of a detailed model of the provincial economy to run projections under different policy parameters and compare those projections to the actual or observed changes in the economy. An example can be found in Mansell (1990, 30-43).

³⁸ The reasons for failure include: lack of objectivity and impartiality in the motivation for, assessment of and justification for publically funded industrial development projects; lack of evaluation that is arm's length from politics; lack of thorough, impartial and independent cost-benefit analysis, viability analysis and risk analysis; dealing with private sector partners without a proven track record and lacking in terms of integrity, competence and financial sustainability; lack of government expertise to properly and accurately evaluate projects and proposals and ensure the information provided by partners is accurate and complete; failure to subject the projects to 'market failure' or 'comparative advantage' tests (to justify government intervention and determine whether the new industry could realistically be competitive without sustained public funding); poor or inadequate audits and financial controls; lack of sunset/contingency clauses to limit taxpayer liability or allow taxpayers to cut their losses in the event of unforeseen changes; and, over reliance on imported expertise with few provisions for the development and use of local skills.

³⁹ Perhaps the most dramatic success has been the development of the in-situ oil sands industry. Much of this can be tied to the Alberta Oil Sands Technology and Research Authority (AOSTRA) created in the 1970s to advance research and technology development to unlock the vast oil sands resources that are too deep to mine. See Hastings-Simon (2019).

and services generally and encouraging innovation and adaptability to thrive in an environment of constant change. It is consistent with broadly-based diversification and development, its effects are not determined by the success or failure of a few projects, it imposes an element of market discipline that encourages efficiency, and it is consistent with diversity of opportunities for diversification and development across many sectors.

This broad-based approach is consistent with the goals and objectives outlined in Alberta's current recovery plan and, for that matter, the earlier strategies going back to 1984. What has often been lacking is the consistent adherence to the basic requirements for this approach to be effective. Most importantly, it requires a commitment to establishing and maintaining an attractive investment climate. This includes: a strong and stable fiscal position for the province; stable, competitive and predictable taxation policies, including low effective tax rates on business investments; a highly skilled and adaptable labour force; and an efficient system with short time frames for regulatory decisions on investments.

Alberta has many strengths that support this broader approach to expand Alberta's economic base and thereby reduce variability. It has high quality social and physical infrastructure, a large and vibrant education, research and development ecosystem, and, in many sectors, a strong culture of entrepreneurship innovation and adaptability, strengths honed through adversity. But there are areas where significant change is required. This includes: shifts to achieve fiscal stability and sustainability for the province; a focus on improving the regulatory and investment environment; better access to risk capital to bridge the 'death valley' where funding is often not available to commercialize and realize the benefits of many innovations developed in the province; infrastructure development and reduced interregional and other trade barriers to allow growth and market diversification for Alberta industries; and, a rebalancing of federal policies to reduce the net federal fiscal outflows from the province.

Secular Instability - the Elephant in the Room

By far the greatest concerns for secular instability of the Alberta economy must center on the long-term prospects for its oil and gas sector. It has been a major driver for the provincial economy (and the Canadian economy) for many decades, making outsized contributions to exports, investment, productivity, incomes and government revenues. However, it seems clear that the headwinds facing this sector, particularly since 2014, will only intensify going forward.⁴⁰ Climate change concerns and policies addressing GHG (Green House Gas) emissions will undoubtedly only grow and increasingly target fossil fuel production, limiting both markets and access to capital.

There is great uncertainty as to what this means for the future of Alberta's oil and gas industry. For example, in the 'Evolving Scenario' of the Canadian Energy Regulator (CER), Alberta production of crude oil continues to grow⁴¹ (especially from in-situ oil

⁴⁰ See Cosby, Sawyer and Stiebert (2021) for a summary.

⁴¹ Although at much lower rates than in the past.

sands operations) until 2040 and the province's natural gas production declines only slightly over the period to 2050. Although substantial new investments in carbon emissions reduction are required, this path would seem quite manageable for the province. In particular, the reduced contribution of the oil and gas sector to overall employment and incomes in the province would be gradual enough to be offset to a large degree by added growth in other sectors,⁴² aided by the types of diversification policies discussed in the previous section.

In a scenario with the addition of even more aggressive policies to reach net-zero carbon emissions by 2050, the transition would be significantly shorter. However, even here, as outlined by Van Wielingen (2021) and by Bataille, Dobson, Kanduth and Winter (2021), a reasonable path of prosperity for Alberta over the longer term would be potentially achievable. It builds on the strong record of the sector and the province for innovation and adaptability. And it builds on the world class experience with energy technologies and on the wealth of both skills and resources (such as viable carbon storage sites) required for large scale carbon capture use and storage (CCUS) or for transitions to hydrogen and other low carbon fuels.

However, there are other quite plausible scenarios that would have much more disruptive and negative impacts. For example, it is entirely possible to have extended periods of lower and highly volatile oil prices as low-cost foreign suppliers compete for shares in a stagnant or declining global oil market. As outlined in Cosbey, Sawyer and Stiebert (2021), in a lower price environment, particularly when price shocks similar to those observed in the past are incorporated, the impacts on the provincial economy would be large, negative and long term.⁴³ It is not hard to come up with other examples of destabilizing external factors with similar implications for Alberta.⁴⁴

The main point is that these types of uncertainty imply considerable risks to the viability of the existing oil and gas industry and to long-run prosperity in the province. Indeed, this potential secular instability is the strongest case for more aggressive policies aimed primarily at diversification of products from the province's various sectors and at diversification of markets for those products.⁴⁵ However, it also makes the case for policies and policy changes: (i) that support the transitioning of the oil and gas sector; (ii) that anticipate and help manage the transitioning of workers and communities; (iii) that are aimed at strengthening, stabilizing and securing the province's long term fiscal health; (iv) that focus more on the long term benefits, recognizing that these often take decades rather than years to materialize; and, (v) most importantly, consistently support a strong investment climate in the province.

⁴² For example, see Spencer and McConnell (2021) and Mintz, Wilson and Tingle (2021).

⁴³ For example, with low prices, the projected average loss of oil and gas GDP would be \$4.4 billion per year to 2050 combined with an average loss of 6,300 (FTE) jobs per year. When oil price volatility is added, these respective declines grow to \$24.3 billion and 24,300 jobs, approximately equivalent to a quarter of current levels. (Crosbey, Sawyer and Stiebert, 2021, p.vii).

⁴⁴ Including shifts in U.S. policies that impair access to that dominant market for Alberta oil and gas.

⁴⁵ In setting these policies the lessons and principles outlined in the previous section also apply.

6. SUMMARY

The twin shocks of low oil prices starting in 2014 and the pandemic of 2020 have imposed substantial costs on Albertans. As in previous downturns there are renewed calls for diversification to address this economic instability. But it is seldom clear exactly what diversification means, how it is achieved and what role it can and should play in helping to stabilize the Alberta economy.

Most commonly, diversification is taken to mean industrial diversification involving the addition of new and 'better' industries. But in reality effective diversification aimed at increasing stability is more likely to involve increasing the range of goods and services produced by existing sectors and facilitating the growth and diversification of markets for all exports from the region while building competitive substitutes for imports.

By most measures, and contrary to common views, the Alberta economy has become much more diversified over time. With respect to employment diversification it ranks among the most diversified regional economies in Canada. However, in terms of incomes and value added (or GDP) it is less so, particularly reflecting the outsized oil and gas sector. By these latter measures it exhibits higher levels of cyclical instability than the benchmark provinces and, looking forward, there are concerns about secular or long-run instability related to the challenges to this sector.

There is a case for policies to encourage industrial development and growth to address the cyclical and secular instability. However, the more commonly proposed forced growth approaches targeting specific industries are often problematic, particularly given the success rates and the potential for large trade-offs resulting in lower productivity, incomes, exports and government revenues. Rather, a broad-based approach is better suited and should be focused more on expanding the range of goods and services produced within the existing industrial structure and on market diversification. Alberta has many strengths that support this broader approach to expand Alberta's economic base and thereby reduce variability. But some changes are required to achieve fiscal stability and sustainability, improve the regulatory and investment climate, increase access to risk capital, expand infrastructure and reduce trade barriers for market growth and diversification, and rebalance federal policies to reduce the fiscal drag on the provincial economy.

The potential secular instability associated with the challenges facing the province's oil and gas sector represents the highest risk to Alberta's long term prosperity. The province has many strengths of adaptability and innovation developed through previous periods of adversity that will be critical in achieving a successful transition for this dominant sector. Strong leadership and consistent policies that anticipate and support this transition will be particularly important.

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APPENDIX Table 1: Share of Total for Employment by Two Digit Industry for Selected Provinces and Years

Industry	2001		2004		2007		2011		2014		2019		2020	
Forestry, logging and support (11N)	AB	0.3%	AB	0.3%	AB	0.2%	AB	0.2%	AB	0.2%	AB	0.2%	AB	0.2%
	ONT	0.2%	ONT	0.1%	ONT	0.1%	ONT	0.1%	ONT	0.1%	ONT	0.1%	ONT	0.1%
	QUE	0.6%	QUE	0.6%	QUE	0.5%	QUE	0.3%	QUE	0.3%	QUE	0.2%	QUE	0.2%
	BC	1.6%	BC	1.3%	BC	1.0%	BC	0.8%	BC	0.8%	BC	0.7%	BC	0.7%
Mining, quarrying and oil and gas extraction (21)	AB	5.3%	AB	5.9%	AB	6.3%	AB	6.3%	AB	6.5%	AB	4.9%	AB	4.9%
	ONT	0.4%	ONT	0.4%	ONT	0.4%	ONT	0.4%	ONT	0.4%	ONT	0.4%	ONT	0.4%
	QUE	0.4%	QUE	0.4%	QUE	0.4%	QUE	0.4%	QUE	0.5%	QUE	0.5%	QUE	0.5%
	BC	0.7%	BC	0.7%	BC	0.9%	BC	1.0%	BC	1.1%	BC	0.9%	BC	0.9%
Utilities (22)	AB	0.7%	AB	0.8%	AB	0.8%	AB	0.8%	AB	0.7%	AB	0.7%	AB	0.8%
	ONT	0.9%	ONT	0.9%	ONT	0.8%	ONT	0.9%	ONT	0.8%	ONT	0.8%	ONT	0.8%
	QUE	0.8%	QUE	1.0%	QUE	0.9%	QUE	0.9%	QUE	0.8%	QUE	0.8%	QUE	0.8%
	BC	0.5%	BC	0.5%	BC	0.5%	BC	0.5%	BC	0.4%	BC	0.5%	BC	0.6%
Construction (23)	AB	6.9%	AB	7.5%	AB	8.8%	AB	8.8%	AB	10.5%	AB	8.6%	AB	8.4%
	ONT	4.0%	ONT	4.3%	ONT	4.6%	ONT	4.9%	ONT	5.2%	ONT	5.5%	ONT	5.6%
	QUE	4.0%	QUE	4.5%	QUE	4.4%	QUE	5.2%	QUE	5.3%	QUE	5.4%	QUE	5.6%
	BC	4.6%	BC	5.2%	BC	6.3%	BC	6.3%	BC	6.6%	BC	7.1%	BC	7.4%
Manufacturing (31-33)	AB	9.2%	AB	8.0%	AB	7.8%	AB	7.0%	AB	6.7%	AB	6.1%	AB	6.1%
	ONT	18.3%	ONT	16.4%	ONT	14.2%	ONT	11.4%	ONT	11.1%	ONT	10.5%	ONT	10.5%
	QUE	18.1%	QUE	16.3%	QUE	14.4%	QUE	12.2%	QUE	11.5%	QUE	11.8%	QUE	11.8%
	BC	10.5%	BC	9.6%	BC	8.7%	BC	7.2%	BC	7.0%	BC	6.6%	BC	6.7%
Trade (41-45N)	AB	17.8%	AB	17.6%	AB	17.3%	AB	17.0%	AB	16.8%	AB	17.0%	AB	17.6%
	ONT	17.4%	ONT	17.4%	ONT	17.3%	ONT	17.2%	ONT	17.4%	ONT	16.5%	ONT	16.7%
	QUE	17.4%	QUE	18.1%	QUE	18.8%	QUE	18.1%	QUE	17.7%	QUE	16.6%	QUE	16.4%
	BC	17.8%	BC	18.5%	BC	18.5%	BC	17.7%	BC	17.4%	BC	16.5%	BC	16.6%
Transportation and warehousing (48-49)	AB	5.3%	AB	5.1%	AB	5.0%	AB	4.8%	AB	4.9%	AB	5.2%	AB	5.5%
	ONT	4.1%	ONT	4.0%	ONT	4.1%	ONT	4.1%	ONT	4.2%	ONT	4.3%	ONT	4.6%
	QUE	4.2%	QUE	4.4%	QUE	4.4%	QUE	4.4%	QUE	4.3%	QUE	4.4%	QUE	4.5%
	BC	5.7%	BC	5.5%	BC	5.3%	BC	5.3%	BC	5.2%	BC	5.0%	BC	5.1%
Information and Cultural (51)	AB	2.0%	AB	1.9%	AB	1.7%	AB	1.7%	AB	1.4%	AB	1.4%	AB	1.3%
	ONT	2.8%	ONT	2.5%	ONT	2.4%	ONT	2.4%	ONT	2.5%	ONT	2.3%	ONT	2.4%
	QUE	2.5%	QUE	2.3%	QUE	2.3%	QUE	2.3%	QUE	2.2%	QUE	2.0%	QUE	2.0%
	BC	2.4%	BC	2.3%	BC	2.5%	BC	2.5%	BC	2.3%	BC	2.4%	BC	2.5%
Finance and Insurance (52)	AB	N/A	AB	2.9%	AB	3.0%	AB	3.2%	AB	2.9%	AB	3.1%	AB	3.5%
	ONT	N/A	ONT	4.7%	ONT	5.0%	ONT	5.3%	ONT	5.3%	ONT	5.3%	ONT	5.7%
	QUE	N/A	QUE	4.1%	QUE	4.3%	QUE	4.4%	QUE	4.3%	QUE	3.9%	QUE	4.2%
	BC	N/A	BC	4.0%	BC	3.9%	BC	4.1%	BC	4.1%	BC	3.9%	BC	4.1%
Real Estate, rental and leasing (53)	AB	N/A	AB	2.0%	AB	2.1%	AB	1.9%	AB	2.0%	AB	2.1%	AB	2.0%
	ONT	N/A	ONT	1.8%	ONT	1.8%	ONT	1.8%	ONT	1.8%	ONT	1.8%	ONT	1.7%
	QUE	N/A	QUE	1.5%	QUE	1.5%	QUE	1.5%	QUE	1.6%	QUE	1.6%	QUE	1.3%
	BC	N/A	BC	2.1%	BC	2.0%	BC	1.9%	BC	2.1%	BC	1.9%	BC	1.9%
Professional, Scientific and technical services (54,541)	AB	6.0%	AB	6.1%	AB	6.4%	AB	6.3%	AB	6.4%	AB	5.9%	AB	6.1%
	ONT	5.4%	ONT	5.1%	ONT	5.6%	ONT	5.7%	ONT	5.9%	ONT	6.5%	ONT	6.9%
	QUE	4.8%	QUE	4.6%	QUE	4.9%	QUE	5.2%	QUE	5.2%	QUE	5.7%	QUE	6.2%
	BC	5.1%	BC	4.8%	BC	5.0%	BC	5.2%	BC	5.4%	BC	5.8%	BC	6.3%
Management of companies and enterprises (55,551,5511)	AB	0.8%	AB	0.8%	AB	0.9%	AB	1.0%	AB	0.9%	AB	1.0%	AB	1.0%
	ONT	0.8%	ONT	0.8%	ONT	0.9%	ONT	0.7%	ONT	0.7%	ONT	0.6%	ONT	0.7%
	QUE	0.6%	QUE	0.6%	QUE	0.5%	QUE	0.5%	QUE	0.6%	QUE	0.6%	QUE	0.6%
	BC	0.8%	BC	0.7%	BC	0.7%	BC	0.7%	BC	0.7%	BC	0.7%	BC	0.8%
Admin and support, waste mgmt. and remediation (56)	AB	4.1%	AB	4.3%	AB	4.4%	AB	4.5%	AB	4.7%	AB	4.8%	AB	4.6%
	ONT	5.0%	ONT	5.9%	ONT	6.4%	ONT	5.8%	ONT	5.8%	ONT	5.8%	ONT	5.8%
	QUE	3.9%	QUE	4.1%	QUE	4.5%	QUE	4.3%	QUE	4.6%	QUE	4.6%	QUE	4.5%
	BC	3.8%	BC	4.3%	BC	4.8%	BC	4.8%	BC	4.9%	BC	4.6%	BC	4.5%
Educational Services (61)	AB	7.2%	AB	7.1%	AB	6.7%	AB	6.8%	AB	6.5%	AB	7.5%	AB	7.5%
	ONT	6.7%	ONT	7.2%	ONT	7.4%	ONT	7.7%	ONT	7.8%	ONT	7.8%	ONT	8.0%
	QUE	8.1%	QUE	8.0%	QUE	7.9%	QUE	8.1%	QUE	8.5%	QUE	8.6%	QUE	8.9%
	BC	7.7%	BC	7.5%	BC	7.3%	BC	7.2%	BC	7.1%	BC	7.4%	BC	7.9%

Health Care and Social Assistance (62)	AB	8.7%	AB	8.7%	AB	8.1%	AB	8.8%	AB	8.8%	AB	10.7%	AB	11.4%
	ONT	9.0%	ONT	9.2%	ONT	9.5%	ONT	10.8%	ONT	10.9%	ONT	11.2%	ONT	11.7%
	QUE	10.7%	QUE	10.9%	QUE	11.0%	QUE	11.7%	QUE	12.2%	QUE	12.6%	QUE	13.7%
	BC	11.2%	BC	10.9%	BC	10.6%	BC	11.5%	BC	11.9%	BC	11.9%	BC	12.9%
Arts, Entertainment and Recreation (71)	AB	1.8%	AB	1.8%	AB	1.7%	AB	1.7%	AB	1.6%	AB	2.0%	AB	1.4%
	ONT	1.6%	ONT	1.7%	ONT	1.7%	ONT	1.6%	ONT	1.6%	ONT	1.8%	ONT	1.4%
	QUE	1.5%	QUE	1.6%	QUE	1.6%	QUE	1.7%	QUE	1.7%	QUE	1.7%	QUE	1.3%
	BC	1.8%	BC	2.0%	BC	1.9%	BC	1.9%	BC	1.9%	BC	2.3%	BC	1.6%
Accommodation and food services (72)	AB	8.6%	AB	8.4%	AB	8.0%	AB	7.7%	AB	8.2%	AB	8.2%	AB	6.8%
	ONT	6.8%	ONT	6.4%	ONT	6.5%	ONT	6.8%	ONT	7.2%	ONT	7.6%	ONT	5.8%
	QUE	6.4%	QUE	6.4%	QUE	6.5%	QUE	6.7%	QUE	6.9%	QUE	7.2%	QUE	5.4%
	BC	9.2%	BC	9.3%	BC	9.3%	BC	9.6%	BC	10.2%	BC	10.1%	BC	7.9%
Other Services (81)	AB	3.9%	AB	4.1%	AB	3.9%	AB	3.9%	AB	4.0%	AB	3.8%	AB	3.5%
	ONT	3.4%	ONT	3.3%	ONT	3.3%	ONT	3.4%	ONT	3.4%	ONT	3.1%	ONT	2.8%
	QUE	3.5%	QUE	3.5%	QUE	3.4%	QUE	3.4%	QUE	3.4%	QUE	3.4%	QUE	3.2%
	BC	3.6%	BC	3.6%	BC	3.5%	BC	3.5%	BC	3.6%	BC	3.4%	BC	3.2%
Public Administration (91)	AB	5.8%	AB	5.5%	AB	5.2%	AB	5.5%	AB	5.1%	AB	5.4%	AB	5.7%
	ONT	6.1%	ONT	6.4%	ONT	6.6%	ONT	7.1%	ONT	6.6%	ONT	6.6%	ONT	6.9%
	QUE	6.5%	QUE	6.3%	QUE	6.4%	QUE	6.9%	QUE	6.8%	QUE	6.8%	QUE	7.3%
	BC	6.1%	BC	5.9%	BC	5.6%	BC	6.1%	BC	5.7%	BC	5.7%	BC	6.1%

Source: calculations using data from Statistics Canada, Table 14-10-0202-01. Available at: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410020201>

APPENDIX Table 2: Share of Total GDP by Two Digit Industry for Selected Provinces and Years

Industry	2001		2004		2007		2011		2014		2019		2020	
Agriculture, forestry, fishing and hunting (11)	AB	1.6%	AB	2.2%	AB	1.6%	AB	1.7%	AB	1.6%	AB	1.8%	AB	2.2%
	ONT	0.9%	ONT	0.9%	ONT	1.0%	ONT	1.0%	ONT	1.0%	ONT	1.2%	ONT	1.5%
	QUE	2.3%	QUE	2.3%	QUE	1.8%	QUE	1.9%	QUE	1.9%	QUE	2.0%	QUE	2.1%
	BC	3.1%	BC	3.1%	BC	2.8%	BC	2.6%	BC	2.6%	BC	2.2%	BC	2.2%
Mining, quarrying and oil and gas extraction	AB	27.7%	AB	26.2%	AB	23.7%	AB	23.3%	AB	23.7%	AB	27.2%	AB	26.0%
	ONT	1.5%	ONT	1.4%	ONT	1.2%	ONT	1.2%	ONT	1.2%	ONT	0.9%	ONT	0.9%
	QUE	1.9%	QUE	1.6%	QUE	1.4%	QUE	1.5%	QUE	1.9%	QUE	2.3%	QUE	2.2%
	BC	5.7%	BC	4.9%	BC	4.2%	BC	4.6%	BC	4.4%	BC	4.3%	BC	4.5%
Utilities (22)	AB	1.8%	AB	1.7%	AB	1.5%	AB	1.4%	AB	1.4%	AB	1.4%	AB	1.5%
	ONT	2.1%	ONT	2.2%	ONT	2.1%	ONT	2.1%	ONT	2.0%	ONT	1.9%	ONT	1.9%
	QUE	3.0%	QUE	3.0%	QUE	3.4%	QUE	3.5%	QUE	3.5%	QUE	3.4%	QUE	3.4%
	BC	1.9%	BC	2.1%	BC	2.3%	BC	2.2%	BC	2.1%	BC	1.9%	BC	2.1%
Construction (23)	AB	7.6%	AB	7.9%	AB	9.9%	AB	9.9%	AB	11.7%	AB	7.3%	AB	7.0%
	ONT	6.6%	ONT	6.7%	ONT	6.8%	ONT	6.7%	ONT	6.7%	ONT	6.8%	ONT	7.2%
	QUE	5.7%	QUE	6.7%	QUE	6.3%	QUE	7.0%	QUE	6.5%	QUE	6.5%	QUE	6.7%
	BC	5.8%	BC	6.7%	BC	7.5%	BC	7.4%	BC	8.3%	BC	8.8%	BC	9.5%
Manufacturing (31-33)	AB	9.6%	AB	8.9%	AB	9.2%	AB	8.2%	AB	7.4%	AB	7.3%	AB	7.1%
	ONT	18.4%	ONT	17.8%	ONT	15.5%	ONT	12.7%	ONT	12.5%	ONT	11.7%	ONT	11.0%
	QUE	19.5%	QUE	17.6%	QUE	16.3%	QUE	14.0%	QUE	13.7%	QUE	13.5%	QUE	13.0%
	BC	8.8%	BC	8.7%	BC	8.4%	BC	7.1%	BC	7.0%	BC	6.7%	BC	6.4%
Wholesale Trade (41)	AB	4.2%	AB	4.3%	AB	4.5%	AB	4.8%	AB	4.6%	AB	4.2%	AB	4.3%
	ONT	5.4%	ONT	5.5%	ONT	6.1%	ONT	6.4%	ONT	6.7%	ONT	6.5%	ONT	6.7%
	QUE	4.8%	QUE	4.9%	QUE	5.4%	QUE	5.3%	QUE	5.5%	QUE	5.3%	QUE	5.6%
	BC	3.8%	BC	4.0%	BC	4.1%	BC	3.8%	BC	4.0%	BC	3.7%	BC	3.8%
Retail Trade (44-45)	AB	3.5%	AB	3.6%	AB	4.2%	AB	4.1%	AB	4.2%	AB	4.0%	AB	4.2%
	ONT	4.5%	ONT	4.8%	ONT	4.9%	ONT	4.9%	ONT	4.8%	ONT	4.9%	ONT	5.0%
	QUE	5.2%	QUE	5.4%	QUE	5.7%	QUE	5.8%	QUE	5.9%	QUE	5.8%	QUE	6.0%
	BC	5.4%	BC	5.5%	BC	5.8%	BC	5.8%	BC	5.8%	BC	5.7%	BC	5.9%
Transportation and warehousing (48-49)	AB	4.4%	AB	4.3%	AB	4.5%	AB	4.4%	AB	4.2%	AB	4.7%	AB	4.2%
	ONT	3.9%	ONT	3.6%	ONT	3.7%	ONT	3.8%	ONT	3.9%	ONT	4.0%	ONT	3.2%
	QUE	4.3%	QUE	4.1%	QUE	4.2%	QUE	4.0%	QUE	4.1%	QUE	4.4%	QUE	3.6%
	BC	5.8%	BC	5.5%	BC	5.3%	BC	5.3%	BC	5.5%	BC	6.0%	BC	4.9%

Information and Cultural (51)	AB	2.1%	AB	2.4%	AB	2.4%	AB	2.4%	AB	2.1%	AB	2.2%	AB	2.4%
	ONT	3.5%	ONT	3.8%	ONT	3.8%	ONT	3.8%	ONT	3.8%	ONT	4.0%	ONT	4.1%
	QUE	3.2%	QUE	3.3%	QUE	3.3%	QUE	3.3%	QUE	3.1%	QUE	3.3%	QUE	3.3%
	BC	3.2%	BC	3.7%	BC	3.7%	BC	3.5%	BC	3.5%	BC	3.5%	BC	3.7%
Finance and Insurance (52)	AB	3.2%	AB	3.2%	AB	3.5%	AB	3.7%	AB	3.5%	AB	4.0%	AB	4.6%
	ONT	7.8%	ONT	7.7%	ONT	8.5%	ONT	8.4%	ONT	8.8%	ONT	9.8%	ONT	10.8%
	QUE	5.1%	QUE	5.4%	QUE	5.9%	QUE	5.6%	QUE	5.7%	QUE	6.3%	QUE	6.9%
	BC	5.4%	BC	5.4%	BC	5.7%	BC	5.7%	BC	5.5%	BC	5.9%	BC	6.2%
Real Estate, rental and leasing (53)	AB	8.5%	AB	8.7%	AB	8.8%	AB	9.5%	AB	9.4%	AB	10.5%	AB	11.4%
	ONT	11.7%	ONT	11.8%	ONT	12.0%	ONT	12.9%	ONT	13.0%	ONT	13.1%	ONT	14.0%
	QUE	9.3%	QUE	9.7%	QUE	10.1%	QUE	10.8%	QUE	11.2%	QUE	11.2%	QUE	11.9%
	BC	15.3%	BC	15.6%	BC	15.9%	BC	17.4%	BC	17.9%	BC	18.1%	BC	19.6%
Professional, Scientific and technical services (54)	AB	5.2%	AB	5.3%	AB	5.6%	AB	5.8%	AB	5.9%	AB	4.8%	AB	4.8%
	ONT	6.4%	ONT	6.2%	ONT	6.4%	ONT	6.4%	ONT	6.5%	ONT	7.2%	ONT	7.4%
	QUE	5.4%	QUE	5.5%	QUE	5.5%	QUE	5.9%	QUE	6.1%	QUE	6.5%	QUE	6.9%
	BC	5.2%	BC	5.1%	BC	5.7%	BC	5.6%	BC	6.2%	BC	6.6%	BC	6.8%
Management of companies and enterprises (55)	AB	0.7%	AB	0.7%	AB	0.7%	AB	0.7%	AB	0.6%	AB	0.3%	AB	0.3%
	ONT	0.6%	ONT	0.7%	ONT	0.7%	ONT	0.7%	ONT	0.7%	ONT	0.4%	ONT	0.4%
	QUE	0.6%	QUE	0.7%	QUE	0.7%	QUE	0.7%	QUE	0.7%	QUE	0.4%	QUE	0.3%
	BC	0.7%	BC	0.7%	BC	0.7%	BC	0.7%	BC	0.6%	BC	0.3%	BC	0.3%
Admin and support, waste mgmt. and remediation (56)	AB	2.1%	AB	2.3%	AB	2.4%	AB	2.3%	AB	2.4%	AB	2.4%	AB	2.3%
	ONT	3.1%	ONT	3.4%	ONT	3.5%	ONT	3.2%	ONT	3.3%	ONT	3.1%	ONT	2.9%
	QUE	2.6%	QUE	2.8%	QUE	2.9%	QUE	2.9%	QUE	2.9%	QUE	2.7%	QUE	2.5%
	BC	2.2%	BC	2.4%	BC	2.8%	BC	2.5%	BC	2.5%	BC	2.4%	BC	2.1%
Educational Services (61,611)	AB	3.7%	AB	3.8%	AB	3.6%	AB	3.7%	AB	3.4%	AB	3.8%	AB	3.8%
	ONT	5.2%	ONT	5.3%	ONT	5.7%	ONT	6.0%	ONT	6.0%	ONT	5.7%	ONT	5.6%
	QUE	5.9%	QUE	5.9%	QUE	5.9%	QUE	6.0%	QUE	6.1%	QUE	5.9%	QUE	5.9%
	BC	5.5%	BC	5.3%	BC	5.3%	BC	5.5%	BC	5.2%	BC	5.2%	BC	5.1%
Health Care and Social Assistance (62)	AB	4.9%	AB	5.1%	AB	4.9%	AB	5.2%	AB	4.9%	AB	5.7%	AB	5.8%
	ONT	6.6%	ONT	6.7%	ONT	6.7%	ONT	7.1%	ONT	6.8%	ONT	6.7%	ONT	6.6%
	QUE	8.4%	QUE	8.3%	QUE	8.3%	QUE	8.3%	QUE	8.3%	QUE	8.1%	QUE	8.2%
	BC	8.4%	BC	7.8%	BC	7.3%	BC	7.4%	BC	7.1%	BC	7.0%	BC	6.7%
Arts, Entertainment and Recreation (71)	AB	0.6%	AB	0.6%	AB	0.5%	AB	0.5%	AB	0.5%	AB	0.6%	AB	0.4%
	ONT	1.1%	ONT	1.0%	ONT	0.9%	ONT	0.8%	ONT	0.8%	ONT	0.8%	ONT	0.5%
	QUE	1.1%	QUE	1.0%	QUE	1.0%	QUE	0.9%	QUE	0.9%	QUE	0.9%	QUE	0.5%
	BC	1.2%	BC	1.2%	BC	1.1%	BC	1.0%	BC	1.0%	BC	1.0%	BC	0.7%
Accommodation and food services (72)	AB	2.2%	AB	2.1%	AB	2.0%	AB	2.0%	AB	2.1%	AB	2.1%	AB	1.6%
	ONT	2.1%	ONT	1.9%	ONT	1.8%	ONT	1.9%	ONT	2.0%	ONT	2.0%	ONT	1.4%
	QUE	2.2%	QUE	2.4%	QUE	2.3%	QUE	2.2%	QUE	2.3%	QUE	2.3%	QUE	1.6%
	BC	3.4%	BC	3.2%	BC	3.0%	BC	2.9%	BC	2.9%	BC	2.9%	BC	2.1%
Other Services (81)	AB	1.9%	AB	1.9%	AB	1.9%	AB	2.0%	AB	2.0%	AB	2.0%	AB	1.8%
	ONT	2.1%	ONT	2.1%	ONT	2.0%	ONT	2.0%	ONT	2.0%	ONT	1.9%	ONT	1.7%
	QUE	2.2%	QUE	2.3%	QUE	2.3%	QUE	2.3%	QUE	2.2%	QUE	2.1%	QUE	1.9%
	BC	2.6%	BC	2.5%	BC	2.4%	BC	2.4%	BC	2.3%	BC	2.2%	BC	1.9%
Public Administration (91)	AB	4.2%	AB	4.3%	AB	4.2%	AB	4.5%	AB	4.2%	AB	4.6%	AB	4.9%
	ONT	6.5%	ONT	6.7%	ONT	7.0%	ONT	7.9%	ONT	7.2%	ONT	7.2%	ONT	7.4%
	QUE	7.1%	QUE	7.2%	QUE	7.2%	QUE	8.0%	QUE	7.6%	QUE	7.4%	QUE	7.7%
	BC	6.4%	BC	6.1%	BC	5.8%	BC	6.5%	BC	5.7%	BC	5.4%	BC	5.6%

Source: Calculations using data from Statistics Canada, Table 36-10-0402-02, available at: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610040202>

CHAPTER 11

BUILDING ALBERTA'S FINANCIAL SECTOR

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* We wish to thank Philip Bazel for his helpful research support and Douglas King for his suggestions on banking and insurance technology, along with Timothy Clausen, Kenneth McKenzie, Robert Mansell and Daria Crisan for their comments on earlier drafts.

After the 2020 pandemic-induced recession, Alberta has turned its attention to its economic recovery agenda (Alberta 2020). Part of this agenda is a focus on sectoral strategies, including building a stronger financial sector. Pursuing broad-scale economic diversification to minimize the province's historical dependency on resource extraction is viewed by many as a critical economic issue facing Alberta. Development of a larger financial sector is a specific priority because of its relatively good labour compensation levels and the ability to draw businesses to co-locate near deep capital pools.

It is not obvious that a larger financial sector translates into higher economic growth (Prochnia and Wasiak, 2017). The “supply leading view” suggests that the growth of financial services helps grow the economy as borrowers and lenders are matched at lower transaction, risk and information costs. The alternative is the “demand-driven view” whereby the financial sector itself is not a determinant of economic growth, but a result of economic demands for advanced financial services.

Many of the world's major financial sector hubs have developed within populous cities, with long histories as prosperous trading ports servicing large inland geographic areas such as New York City, London, Tokyo, Shanghai, Sydney and Toronto. However, other significant financial-sector hubs have developed around the world in locations that did not have the geographic advantage of being located in areas with large population bases and pre-existing deep pools of wealth. Singapore, Switzerland, Luxembourg, Hong Kong and Delaware are all examples of such jurisdictions. This second group of financial sector hubs have succeeded in developing significant local financial-sector industries through effective regulatory and tax policy, inducing market actors to set up shop based on the comparative advantages for financial sector operations in those particular jurisdictions.

This paper focuses on two key issues. The first is to examine those supply-driven factors that enable financial markets to expand, as seen in various jurisdictions. In this section, we compare Alberta's financial sector depth to other provinces. We also look at OECD and non-OECD countries with the largest financial and insurance sectors as a share of GDP. We observe that jurisdictions with larger financial and insurance sectors have favourable conditions, including a strong rule of law, low political risk, low withholding and corporate income taxes, and financial soundness resulting from regulation. The second is to discuss how those factors could apply to Alberta and the policy choices that would result in a growing financial sector. We provide several ideas that could be considered to enhance and deepen the financial sector in Alberta, specifically focusing on ways to provide earlier-stage access for entrepreneurial companies to access larger, and more diverse, pools of capital through various mechanisms including the development of an Alberta “captive” stock exchange for junior issuers.

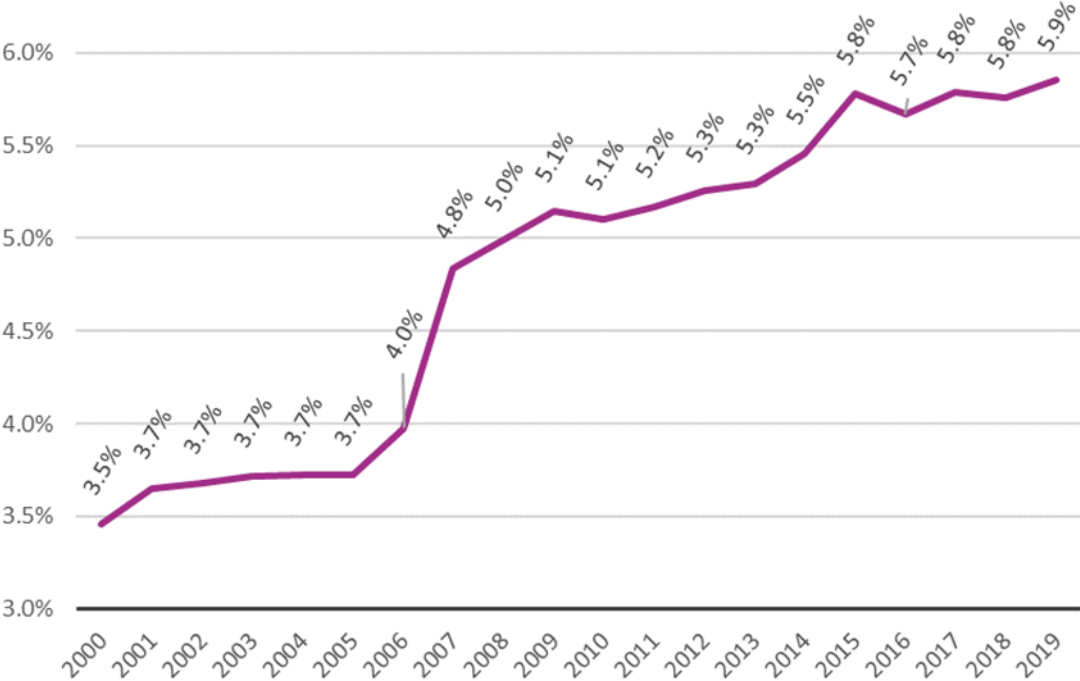
I. LESSONS FROM ABROAD FOR FINANCIAL SECTOR SIGNIFICANCE

To start, it is useful to understand how important the financial sector is in Alberta, and how that compares to other provinces in Canada. The financial sector includes banks, credit unions, brokerages and investment banks, trust and mortgage companies,

insurance, leasing and investment funds. To measure the size of the financial sector, we use value-added analysis of the finance, insurance and leasing sectors as a proportion of provincial GDP.¹

As shown in Figure 1, Alberta’s financial sector has grown substantially as share of its GDP from 3.5 per cent in 2000 to 5.9 per cent in 2014. Not shown, Alberta’s share of Canada’s financial sector value-added also increased from 9.1 per cent of GDP in 2000 to 12.1 per cent by 2019 (it peaked in 2014 at 13.7 per cent). Given the ebbs and flows largely reflect the economic boom in the resource markets, one could argue that Alberta’s financial sector growth has been largely driven by demand factors.

Figure 1: Finance, Insurance and Leasing Value-Added as a Share of Alberta’s GDP

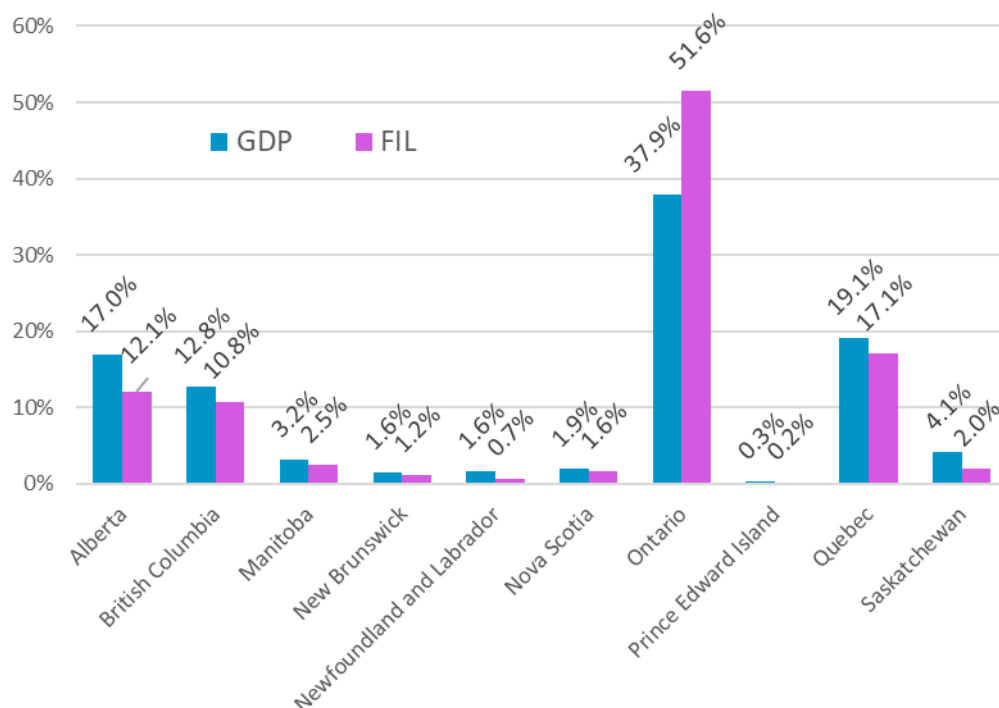


Source: Statistics Canada, Table 36-10-0402-01.

While the financial sector has grown in importance in the past two decades, it accounts for a smaller share of Alberta’s economy compared to Ontario. As shown in Figure 2, Alberta’s financial sector accounts for 12.1 per cent of Canada’s financial sector in 2019 while Alberta’s share of Canada’s GDP is 17.0 per cent. In contrast, Ontario’s share of Canada’s financial sector is 51.6 per cent while its share of Canada’s GDP is 37.9 per cent. None of this is surprising – financial services in Canada have largely concentrated in the Toronto region. Quebec accounts for the second highest share of Canada’s financial sector (17.1 per cent), although this is less than its share of Canada’s GDP (19.1 per cent). British Columbia follows Alberta with a financial sector share of 10.8 per cent, also below its share of GDP (12.8 per cent).

¹ The real estate sector is excluded including real estate investment trusts since it reflects value-added related to residential and commercial real estate. This sector is not part of “finance”.

Figure 2: Provincial Shares of Canada's Financial Sector and GDP 2019



Source: Statistics Canada, Table 36-10-0402-01.

So, if the financial sector were to be a driver of growth rather than driven by growth, what would be required to do so? The World Bank considers four major factors influencing financial sector development: access, depth, efficiency and stability. In ranking 114 global financial centres, key factors include the business environment (political stability, tax and cost competitiveness, macroeconomic environment and regulatory environment), human capital (education and skills), communication and transportation infrastructure, financial sector development (depth and breadth of industrial sectors, liquidity and availability of credit) and reputation.²

In Tables 1a and 1b below, we provide the top ten OECD and top 10 non-OECD countries, ranked according to importance of their finance and insurance sectors.³ To provide some analysis, we look at several factors related to the strength of the financial sector: rule of law (corruption), efficiency (non-interest expenses as a share of gross income), financial stability (capital adequacy) and tax variables (corporate income tax and withholding tax rates). Some OECD jurisdictions have quite large financial sectors relative to the size of their economy - Luxembourg having the largest financial sector given its size, followed by Australia and the United States. Among non-OECD countries, jurisdictions with quite sizable financial sectors include Caribbean countries, Cyprus, Mauritius, Hong Kong and Singapore.

² A *Global Financial Centres* survey solicits about 11,000 responses since 2007 (City of London, Z/Yen and the China Development Institute, 2021). Calgary is included in the ratings - it scores at 593, well below Vancouver (719), Montreal (696) and Toronto (695), losing 56 points since the previous year. This undoubtedly reflects the state of Alberta's economy.

³ Note that leasing is not included here. The United Nations data provide an alternative measure of output as a share of GDP that provides somewhat different rankings.

We note that several important factors influence the size of the financial sector. The first is rule of law (which is relatively strong in the OECD compared to non-OECD countries, except Hong Kong which is similar to OECD countries at least until recently). The Belgian, Hong Kong, Singapore and Mauritius financial sectors seem to operate efficiently with respect to cost, with non-operating expenses at less than one half of gross income (differences among other countries is slight). Capital adequacy is especially strong in Ireland, a turn of events since the 2008 financial crisis when several Irish banks faced bankruptcy. Almost all jurisdictions except Lesotho have no withholding taxes on portfolio interest (especially with treaty partners). Some countries attract financial companies with low corporate income tax rates (Ireland, Switzerland and most non-OECD countries). The financial centre ratings are particularly strong for the Singapore, Switzerland, United States (New York City), Luxembourg and Hong Kong⁴ (all above 700), reflecting a wide number of factors described above including the availability of skilled workers, good infrastructure and reputation.

Canada has been recognized as offering a strong regulatory system that enabled it to avoid financial instability during the 2008 financial crisis (Lynch, 2010). This included strong capital adequacy requirements, an integrated approach to regulating banking, finance and insurance companies through the Office of Superintendent of Financial Institutions, and rules that limited risky mortgage lending. On the other hand, Canada has a relatively highly concentrated financial sector – the top three banks account for 58 per cent of assets, slightly lower than OECD average.⁵ Foreign-controlled banks enter the Canadian financial services market, but are either limited in size or scope (wholesale only rather than retail). With economies of scale, large banks can reduce financial intermediary costs, although a lack of competition can result in higher loan rates or lower deposit rates to captured markets. As for taxation, Canada exempts non-arm's length interest from withholding tax, as well as interest paid to related non-residents. Its federal-provincial corporate income tax rate – on average 26.2 per cent – tends to be on the higher side compared to other significant centres.

⁴ Recent political stress in Hong Kong could impact on its ratings in the future.

⁵ The United States, Japan, Luxembourg and Poland have the least concentrated banking sectors with top three accounting roughly 40 per cent of assets. The most concentrated banking sectors are in Israel, Estonia, Finland and Norway with a concentration ratio equal to 100 per cent or somewhat less. See World Bank data base.

Table 1a: Top OECD Countries with largest financial sectors (value-added basis)⁶

	Financial Sector Share of GDP (1)	Rule of Law (2019) (2)	Financial Efficiency (3)	Financial Stability (4)	Corporate Income Tax Rate (5)	Withholding Tax Rate on Interest (6)	Financial Centre Rating (7)
Luxembourg	22.7%	80	78.4%	22.8%	24.9%	0%	712
Australia	9.3%	77	74.3%	15.7%	30%	0/10%	711 (Sydney)
United States	7.6%	67	61.2%	16.2%	25.7%	0/30%	764 (NYC)
Switzerland	7.6%	85	68.4%	19.3%	18%	0/35%	720 (Zurich)
Ireland	5.8%	72	75.1%	25.2%	12.5%	0/20/33%	650 (Dublin)
Chile	5.1%	67	46.8%	12.8%	27%	4/35%	597 (Santiago)
Belgium	5.0%	76	39.4%	18.8%	25.5%	0/15/30%	676 (Brussels)
Israel	4.9%	60	66.4%	14.6%	23%	0/23%	666 (Tel Aviv)
Netherlands	4.7%	82	73.8%	22.8%	21.7%	0%	695 (Amsterdam)
Denmark	4.7%	88	64.8%	22.5%	22%	0/22%	680 (Copenhagen)

Note: New Zealand (6.2% share) would be ranked 5th, but is excluded due to missing data in certain other categories. Canada's financial sector value-added share is 2.9 per cent and therefore not ranked in top 10.

Table 1b: Top Non-OECD Countries with largest financial sectors (value-added basis)

	Financial Sector Share of GDP (1)	Rule of Law (2019 Corruption Score) (2)	Financial Efficiency (3)	Financial Stability (4)	Corporate Income Tax Rate (5)	Withholding Tax Rate on Interest (6)	Financial Centre Rating (7)
Cayman Islands	33.8%	--	--	--	0%	0%	592
British Virgin Islands	21.5%	--	--	--	0%	0%	614
Hong Kong	18.1%	77	46.8%	20.3%	16.5%	0%	741
Bermuda	15.9%	--	--	--	0%	0%	580
Curaçao	14.9%	--	--	--	22%	0%	--
Singapore	12.9%	85	44.3%	17.0%	17%	15%	740
Mauritius	11.7%	53	40.9%	20.5%	15%	0/15%	573
Cyprus	10.1%	57	68.5%	19.8%	12.5%	0%	561
Lesotho	9.1%	41	58.5%	19.4%	20%	15/25%	--
Bahamas	9.0%	63	--	--	0%	0%	591

Sources:

- (1) United Nations – finance and insurance sectors measured by gross output as a share of GDP
- (2) Corruption Perception Index: <https://www.transparency.org/en/cpi/2020/index/usa>. Higher values indicate less corruption.
- (3) IMF, Non-interest expense to income, 2019, <https://data.imf.org/regular.aspx?key=61404589>.
- (4) IMF, Regulatory Capital to Risk-Weighted Assets 2019.
- (5) Bazel and Mintz, University of Calgary
- (6) EY
- (7) Global Financial Centres Index, March 2021.

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New Zealand (6.2% share) would be ranked 5th, but is excluded due to missing data in certain other categories. Canada's financial sector value-added as a share of GDP is 2.9 per cent and therefore not ranked in top 10.

For the financial sector to take off in Alberta, a large number of factors would need to come into play. Given that Alberta collects its own corporate income tax, it could use tax as a lever to attract mobile financial service companies. To this end, Alberta's corporate income tax rate, now at 8 per cent (for a combined federal-provincial rate of 23 per cent), is the lowest in Canada and likely soon to be the lowest in North America if the US raises its corporate income tax rate in the near future. However, even if there was no Alberta corporate tax, the federal tax would apply at 15 per cent. Withholding tax is determined by the federal government, and therefore reflects a policy that cannot be controlled by the Province. Alberta could also make itself more attractive for financial companies by having a regulatory structure that is of a higher standard and greater efficiency than elsewhere - which is the primary focus of the next section.

II. AREAS OF FINANCIAL SECTOR REGULATORY REFORM AND INNOVATION

Financial regulation involves three objectives: (i) efficiency, (ii) financial stability and (iii) investor protection. Efficient regulation supports competitive financial markets that enable borrowers to have the lowest possible capital cost and for lenders to have the highest possible returns on their investment (commensurate with risk). Financial intermediaries reduce risk costs through the diversification of their portfolio of assets widely held by investors. They also enable borrowers and lenders to be matched at the lowest transaction and information costs. Therefore, innovation in financial markets can also achieve efficiency by reducing the cost of financial intermediation. Regulation also supports financial stability (avoiding financial stress when investors lose confidence in financial institutions) and investor protection (ensuring investors are protected from fraud and lack of disclosure etc.). The trick to financial regulation is to make sure that, over time, efficiency considerations are appropriately traded off with financial stability and investor protection objectives.

Given capital is highly mobile, it is sensitive to regulatory efficiency considerations. The stress on regulatory efficiency is especially related to the availability of alternative sources of finance for markets that are less well served due to excessive financial intermediary costs. A broader capital market can result in lower risk costs, as investors have a larger pool of investments and companies can have a wider investor base to share risks. Informational costs are especially important in financial markets, so the availability of institutions going beyond bank lending is critical to financial development in Alberta. Thus, efficiency considerations to correct for underlying market failures are particularly important in certain segments of capital markets.

Moreover, with respect to competition from American states that have evidenced a recent willingness to adopt aggressive pro-efficiency regulations, Alberta enjoys broader constitutional authority as a sub-national jurisdiction with exclusive jurisdiction in the key areas of property and commercial law, as well as the administration of justice. This constitutional authority opens up a plethora of regulatory tools in Alberta's toolkit that are not available at the state level in the U.S.

Admittedly, not all of the proposed reforms below will be popular with entrenched financial market interests across Canada, particularly at a time when many voices elsewhere in Canada are taking business development for granted and urging additional expensive regulation. However, we believe that Alberta currently enjoys an important advantage in this regard. While the economy of the other populous Canadian provinces thrived in recent years up until COVID, the Albertan economy has comparatively stagnated since 2014. As a result, Albertans are keen to see economic growth prioritized in public policy initiatives, providing a useful context and momentum for innovative and efficient regulatory reform.

In this section, we identify a number of the most promising initiatives for regulatory reform and innovation, briefly outlining ideas with the greatest potential to create a competitive advantage for the Alberta financial sector. One principal focus is on initiatives to improve entrepreneurial and growth-stage capital markets, particularly with reforms to corporate law and securities regulation. We then turn to other potential areas of reform that would enable Alberta to create dynamic markets in open banking, fintech and insurance and reinsurance.

A Made-in-Alberta Precedent for Innovative Financial Market Policy Initiatives

The idea of being an innovator in utilizing regulatory policy to stimulate financial markets is not new in Alberta. In fact, Alberta led the world in developing and refining publicly-traded blind capital pools in the late 1980's. The capital pool program originated as a joint regulatory initiative of the Alberta Securities Commission (the "ASC") and the Alberta Stock Exchange (the "ASE") in 1986. Although the capital pool initiative was widely criticized by many out-of-province industry observers at the time as being too radical, this innovative financing structure has become a staple of capital markets throughout Canada and beyond. More than 2600 capital pool companies have been created to date in Canada. Companies that originated as capital pools in Canada have raised over \$75 billion in equity through follow-on financings on the TSX, and comprise 32% of the TSXV grads now listed on the TSX. Similar capital pool structures have also gained increasing prominence in the U.S., with US\$64 billion in equity raised in 2020 alone through initial public offerings of Special Purpose Acquisition Companies.

From its inception and through the 1990's, the capital pool program offered a distinct competitive advantage to Alberta financial sector, stimulating a robust junior securities market and bringing many entrepreneurs from outside the province to access this unique financing vehicle. Eventually, however, other Canadian jurisdictions adopted their own versions of the capital pool program, and any competitive advantage to Alberta of being the originator of the concept was lost in the late 1990's when the ASE merged with out-of-province exchanges to ultimately form the TSXV. The capital pool program, therefore, serves as both an inspirational precedent, and a cautionary tale, for those seeking to stimulate financial sector growth in Alberta through innovative regulatory policy.

EXPANDING ENTREPRENEURIAL AND GROWTH-STAGE CAPITAL MARKETS

Our overarching theme is to create an expanded opportunity for entrepreneurial and growth-stage companies to access more diverse pools of capital at earlier stages, at lower financing costs, and with reduced compliance obligations. Securities regulators in Canada execute a dual mandate in terms of being both protectors and promoters of capital markets. In executing the capital markets protection function, securities regulators are tasked with protecting individual investors, who place their faith in the reliability and trustworthiness of the system, as well as capital markets as a whole, by providing stability to the markets. However, we believe that the pendulum of securities regulation across Canada has often swung too far in favour of protecting individual investors, at the expense of striking an appropriate balance with the competing mandate of fostering public and private capital markets.⁷ This tilt towards investor protection ultimately has led to an unintended consequence in which retail investors are prevented from accessing the higher-return market segments, as start-up and growth-stage companies have increasingly avoided public markets and gravitated towards private financing options. With restrictive accredited investor requirements and high minimum subscription levels for participation in private equity and venture capital funds, only a small percentage of individual investors have access to many of the faster growing firms.

A major opportunity for Alberta, therefore, is to foster an alternative capital market segment, giving entrepreneurial companies access to an increased number of equity financing sources currently reserved for public issuers (without simultaneously foisting on them the full range of public company compliance obligations), while also giving a broader group of individual investors increased access to the entrepreneurial and growth-stage market segment. This could be achieved by several securities and corporate law reforms.

(a) Announce to the world that Alberta is charting its own distinctive efficiency-focused regulatory path for the financial sector

Alberta must make it clear that it is committed to charting its own distinctive path forward in aggressively pursuing financial-sector growth, particularly for start-up and growth-stage companies. This commitment must be internally directed and take advantage of Alberta's unique business environment and community expectations of government. It is not consistent with joining the national securities regulatory initiative. Creating the preconditions for supply-driven growth will require significantly differentiating Alberta's regulatory environment from those around it. The past twenty years of increasing capital markets harmonization across Canada provide ample evidence that harmonization leads to continuing concentration of financial sector job creation elsewhere in Canada.

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Two major factors contributing to the significant increase in capital markets regulation were the devolution of rule-making power from provincial legislatures to the local securities commissions in the 1990's and the regulatory initiatives that resulted from the global financial crisis of 2008.

Alberta may continue working towards harmonization and reciprocity for securities policies that impact senior issuers listed on the TSX or American exchanges, but must pursue distinctive made-in-Alberta securities initiatives to create a strong pro-issuer jurisdictional advantage for entrepreneurial, growth-stage and junior public companies.

(b) Build or acquire a “captive” stock exchange to serve Albertan ambitions, and leverage the Alberta captive exchange to create alternative trading boards that significantly enhance access to capital for issuers and higher-growth investment opportunities for individual investors.

Crucially, many possible strategies depend on the presence of a secondary market for junior issuers based in Alberta, and subject mainly to Alberta-based oversight and regulation. Local control of the ASE in the 1980’s was foundational to the collaboration that created the capital pool company program, notwithstanding the skepticism and objections from central-Canadian regulators. Now, only 19 out of 105 currently listed employees of the TSXV are based in Alberta, none in senior executive positions.

Effective collaboration between the provincial government, the ASC and a captive stock exchange is an essential pre-condition to pursuing some of the more innovative financial markets expansion ideas, including the creation of the alternative trading boards discussed hereafter.

Options to be considered for re-acquiring an Alberta-dominated exchange include making an offer to purchase the existing TSXV or CSE exchanges by parties in Alberta (public and/or private) or developing a new exchange.

Leveraging an Alberta-based captive exchange, three alternative trading boards can be envisioned that could be significantly accretive to the Alberta capital markets landscape, giving start-up and growth companies increased access to capital and individual investors increased access to high-growth investment opportunities.

The first alternative trading board would give private companies access to an IPO-lite offering, in which companies have access to a primary market for treasury issuances and investors have a secondary market for trading.⁸ Treasury offerings on this board would require only a limited disclosure document similar to an offering memorandum. Continuous disclosure could be limited to *only* the disclosure required by ABCA along with a simplified annual disclosure document. Regulations could place significant resale restrictions, or outright prohibitions, on all company insiders, recognizing that that this alternative trading board is designed for use as a financing vehicle to fund company growth and development, not for insider liquidity.

All investors eligible to participate in this alternative market (primary and secondary trading) would be certified as accredited investors, specifically registered with the ASC. However, the accredited investor definition should be significantly expanded to allow certification based on knowledge and experience, which can include completion of self-

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This idea borrows from the Regulation D initiative in the United States, but would extend beyond the American precedent in its scope. Implementation of this alternative trading board would require bespoke regulatory exemptions designed and implemented by the ASC.

study modules in various core topics published by ASC. Consider limiting maximum investment by an individual investor in any one company listed on this alternative board to a safety threshold.

Secondary market trading in companies on this first alternative board could also be limited to seasonal “trading windows” within a specified period after release of the annual filing form, or similar disclosure document (such as an offering memorandum or voluntarily updated disclosure form), to ensure trading only occurs in the presence of current publicly available information.

Distinguishing it from the first alternative trading board, a second alternative trading board could be open to all individual investors. Listed companies would be reporting issuers, but with materially streamlined initial public offering processes and continuous disclosure requirements (e.g. 6-month financial statements, instead of quarterly statements, with simplified business disclosure document formats).⁹ Possibly, regulations could permit at-the-market treasury issuances by participants based on a simplified form of annually updated shelf prospectus, which would double as the annual business disclosure document for each issuer. This second alternative board would allow insiders to sell, providing liquidity options for company founders. Essentially, this second alternative board would serve as an alternative market to the existing TSXV and CSE, but would offer easier access to capital for issuers, along with simplified and less expensive continuous disclosure requirements.

The third alternative trading board would be designed to give Alberta retail investors access to the higher-growth prospects currently concentrated in the venture capital and private equity markets. This board would allow the listing of actively-managed mutual fund companies that invest solely in private start-up and growth-stage companies. Companies listed on this board would have the benefit of a streamlined disclosure template for reporting on portfolio companies. Ensuring effective governance within the private portfolio companies would primarily be the purview of the mutual fund managers, not the regulators. While providing public investors with access to higher-return investment opportunities, risk reduction for individual investors would be attained through diversification of investment portfolios within individual funds. Further diversification could be obtained through fund-of-funds structures such as electronically-traded funds. To align the interests of public investors with mutual fund managers traded on this board, cash management fees payable to the fund managers should be limited, with compensation for fund managers principally determined by fund performance above hurdle rates and calculated only on realized gains at time of portfolio company dispositions (as opposed to mark-to-market carrying values of investments).

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This idea borrows from the Regulation A+ initiative in the United States, but again would extend beyond the scope of the American precedent.

(c) Allow companies and market forces to be the principal determinants of CSR and DEI mandates, not regulators

Securities commissions and stock exchanges in recent years have been continually increasing corporate governance, CSR (corporate social responsibility), and DEI (diversity, equity, inclusion) mandates on companies. However, market forces have also evolved rapidly during this period, and sources of capital have become clear in advising companies that they will demand specific CSR and DEI elements as preconditions of investment. We believe that the market is nimble and effective in addressing constantly evolving CSR and DEI best practices, and therefore should be the principal determinants of CSR and DEI mandates. Taking this approach is a prospective competitive advantage for Alberta, particularly as other jurisdictions move towards increasingly complex CSR and DEI requirements. Preserving a market-driven approach would allow more freedom for junior companies to adopt governance, CSR and DEI initiatives at appropriate stages of corporate development.

(d) Initiatives to re-orient the Alberta alternative capital markets from short-termism to long-termism

This set of policy initiative proposals reflect the belief that the Alberta alternative capital market system should be focused on long-term business growth and job creation, and not short-term trading profits. Among the specific initiatives that would support long-termism are the following:

- Reduce the frequency of financial reporting to six months or annually, depending on the particular trading board.
- Adopt a shareholder voting structure (similar to the one piloted in France) whereby shareholder voting rights lag investments, gradually accumulating base on the length of ownership by the shareholder. For example, 1/3 voting rights might vest immediately, 2/3 after one year of holding, and full voting rights after the second anniversary of acquisition.
- Eliminate or severely restrict short-selling for smaller issuers (where market manipulation by short sellers is quite easy), and reinstate the up-tick rule for all other issuers.
- Provide incentives for market-making activities by designated intermediaries.
- Permit (with shareholder approval) the adoption by issuers of classified boards with multi-year terms.

(e) Protect companies from special interest interference by establishing minimum holding requirements for advancement of shareholder proposals

Abundant empirical evidence has shown that shareholder proposals have virtually no utility, but instead represent deadweight losses to companies and their shareholders.¹⁰ Nearly all proposals in Canada fail to even attract majority shareholder support. Set a minimum ownership threshold for the advancement of shareholder proposals at a level of

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A review of the relevant empirical studies is contained in Tingle, 2021.

significance (e.g. 10% of a share class). However, allow individual shareholders to combine their votes to reach the minimum significance level by submitting joint resolutions.

(f) Fundamentally re-work the system of shareholder communication to align with the current realities of modern communication

The existing system of shareholder communication is obsolete and fails to take advantage of the technical developments of the past 30 years. Alberta should adopt systems that simplify and streamline shareholder communication, including the following ideas:

- Provide issuers with the ability to know who beneficially owns their shares so they may directly communicate with them.
- Require every beneficial shareholder to have a valid email address through an individual trading ID, which would be the address for all shareholder communications and continuous disclosure via electronic delivery.
- Allow for fully online annual general meetings and special shareholder meetings.
- Significantly abridge the advance notice requirements for all corporate meetings to reflect the realities of instant communication.
- Allow electronic proxy appointment.
- Create a statutory cause of action against publishers of corporate disinformation online for personal gain.

(g) Update the ABCA to reflect best practices from Canada and abroad

The ABCA needs a major revision to adopt many of the best innovations in corporate statutes from across Canada and abroad. The ultimate goal should be to make Alberta the preferred statute for incorporation for business leaders across Canada, similar to the ways Delaware has used its legal system to become dominant in the United States. Among the proposed ABCA amendments to be considered are the following:

- The object of the duty of care must be clarified, similar to reforms made by Ontario.
- The sections relating to the indemnification of directors and officers should be amended to reflect reforms made federally in Ontario.
- Proportional liability of directors and officers should be considered, along with increased clarity on the requirements for exercising due diligence defences.
- Corporate opportunity waivers should be permitted generally along the lines permitted in Delaware
- The rules around unanimous shareholders agreements (“USA”) need to be updated to permit fettering of directors’ discretion, allow shareholders to choose the thresholds for amendment or termination, permit shareholders to avoid liability by disclaiming powers granted by a USA, etc.
- Follow Ontario in allowing written resolutions to be effective with less than every shareholder’s signature
- Permit the adoption of classified boards with shareholder approval.

(k) Administration of Justice- Create a specialist court for corporate law and reduce incentives for litigation opportunism

Following the Delaware example, Alberta should consider creating a separate Court of Chancery, with exclusive original jurisdiction in all corporate law matters, and serving as the appeal court from decisions made by the Alberta Securities Commission. All judges on this court would be subject matter experts in corporate law. The Court of Chancery would provide swift, expert, cost-effective rulings on complex matters of corporate law.

Allow the Chancery Court to be designated as a neutral arbitration site for international corporate dispute resolution, providing low-cost professional dispute resolution for international companies on a for-fee basis.

Also, consideration should be given to placing maximums on contingency-based legal fees payable to class action litigators. Corporate litigation should serve the interests of injured stakeholders, not serve as lottery tickets for the class action bar who troll public filings for perceived deficiencies.

BANKING, FINTECH AND INSURANCE

Pockets of Alberta financial markets could be served by new and innovative institutions. Compared to other countries, open banking and fintech are less developed in Canada. Insurance markets are well developed, but Alberta could strengthen its role especially in captive insurance and reinsurance. Below, we provide several areas of potential growth.

(a) Responding to the challenges and opportunities associated with the intersection of rapidly evolving technologies and financial sector regulation.

To become a new economy financial center, Alberta's strategy must successfully anticipate where regulation and technological innovation will intersect. Successfully competing in this space will necessitate an integrated technology-based strategy that successfully anticipates the opportunities and challenges associated with rapidly evolving issues such as personal privacy, adoption of digital assets technologies, disintermediation, decentralized autonomous organizations and security of digital transactional interaction.

Consolidating regulators across banking, credit unions, pensions, insurance is a place to start. The resulting regulatory body should be properly resourced and charged with working with regulators elsewhere in Canada, such as OFSI, to level the playing field when Alberta-based financial firms experience obstacles. It should also be tasked with driving innovation and "fast following" global best standards of efficiency in promoting financial stability and investor protection.

(b) Open banking initiatives

Research should evaluate the opportunities for the creation of an Alberta-specific open banking initiative for locally-based financial institutions. Open banking enables more efficient sharing of personal banking data in secure environments, with the prior consent of individuals, through the use of application programming interfaces ("APIs).

Open banking initiatives define the parameters for the development and deployment of APIs to maximize efficient financial information sharing, while preserving confidentiality and security of individual financial data. Open banking initiatives offer the prospect of significantly enhanced banking experiences for individuals by increasing the integration of third-party financial applications with existing online banking platforms.

(c) Become a jurisdiction of choice for international banking services based on Canada's existing reputation for stability and tax-treaty structure

Many banks in tax-advantaged jurisdictions abroad are now struggling with the impact of managing international standards for know-your-client (“KYC”) and anti-money laundering (“AML”) compliance. Companies incorporated in these same jurisdictions are facing challenges in opening bank accounts abroad and transferring funds due to complex and inefficient KYC and AML compliance programs.

Alberta should aspire to become a jurisdiction-of-choice for the international banking industry, leveraging its reputation for political stability and Canada's tax-treaty structure by focusing on using technological solutions for streamlining KYC and AML verification to reduce processing delays and improve verifiability. In particular, the provincial government's combined legislative and regulatory role could allow Alberta to become the originator of a global standard for certifying digital identity for business transactions, greatly reducing compliance costs for local financial institutions servicing the international market.

(d) Focus on Creating an Ecosphere for Successful Fintech Development

Alberta currently lags other jurisdictions in Canada on fintech development and needs to be aggressive in catching up. We should consider supporting innovation hubs with streamlined access to seed funds for fintech start-ups, encourage collaboration with university finance faculty to support talent pipelines and reskilling of existing talent, and streamline the process for transferring jointly developed intellectual property in the fintech space to private start-ups.

Further, Alberta should offer dedicated governmental contacts for fintech firms where they can seek instruction on specific issues and obtain non-binding guidance in relation to licensing or registration requirements, as well as regulatory and supervisory expectations.

(e) Insurance and Reinsurance

The opportunities and challenges associated with increasing Alberta's attractiveness as an insurance and reinsurance hub are similar to Alberta's ability to attract increased banking services, including the need to adopt specific captive insurance and reinsurance regulations that leverage new technologies and processes to streamline the regulatory and reporting requirements. Also, creating strong segregated portfolio legislation and facilitating private acts of the legislature to restrict access to certain insurance assets may be required to gain significant traction in this space.

(f) Support Regional Banks

Alberta has two medium-sized financial institutions: Alberta Treasury Branch (“ATB”) and Canadian Western Bank (“CWB”). The province should carefully investigate what conditions are preventing these institutions from growing. In particular, if there is not a level playing field between Canada’s largest banks and mid-tier banks (such as might arise from differing fractional reserve models) the province should take the lead in insisting on reforms of federal banking regulation.

Within the province, Alberta should ensure that a level playing field exists between credit unions and finance cooperatives. A concept of regulatory personality could help promote new entry of market participants and expansion to strengthen competition, but this must also be balanced with escalating requirements as firms become larger.

(g) Evaluate the Alberta Enterprise Corporation

The Alberta Enterprise Corporation (“AEC”) has a mandate to create a venture capital ecosystem in Alberta and to facilitate the delivery of capital to early-stage companies in the province. The performance of AEC against these objectives should be carefully scrutinized. If AEC investments are not creating local venture capital management teams, or if AEC investments are mostly being made in businesses located outside of the province, reforms need to be made.

CONCLUSION

Admittedly, none of the specific reforms or innovations outlined above singularly offer the prospect of putting Alberta in a position to out-compete other jurisdictions in the financial sector for an extended period of time. In order to achieve that ambitious goal, it will be essential for a broad range of reforms and innovations to be adopted in Alberta in the upcoming years, thereby making it clear to the financial markets domestically and abroad that Alberta is firmly committed to delivering the most aggressive pro-business environment for financial sector operations. To sustain this credible commitment, strong institutions and political support for steady and continuous improvement will be critical.

As evidenced by the capital pool company program, we must also anticipate that the best innovations that Alberta adopts will ultimately be copied by other jurisdictions, and any comparative advantages associated with specific initiatives will erode over time. It is, therefore, critical to reinforce Alberta’s continuing commitment to ongoing financial sector innovation to attract the necessary volume of new financial start-ups and existing financial sector participants.

The ideas set forth are not intended to be exhaustive, but rather to indicate the types of initiatives that can be put forward for evaluation. The space limitations of this paper restrict this analysis to only a fraction of the reform and development ideas that we have identified as warranting further consideration. Additional ideas, such as focusing on creating a local hub for trading carbon (and other environmental) credits, development of cryptocurrency initiatives, and establishment of geographically-based

centres-of-excellence in specific cities for certain financial sector niches, may also be worthy of further development and evaluation. Many prospects discussed in this paper have not yet been sufficiently researched to conclusively recommend their adoption in Alberta. Completing the analysis necessary to prioritize and evaluate possible reforms, and to recommend the specific reforms and innovations that should be pursued as priorities in Alberta, will be the focus for future research.

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CHAPTER 12

**ALBERTA
AGRI-FOOD
FUTURES**

Karen Spencer and Kim McConnell, CM

Alberta's agri-food industry is a gentle giant that's about to awaken. It's an industry with scale, built on a foundation of excellence, and bubbling with a bundle of potential.

It's an industry recognized and respected internationally, yet sometimes misunderstood and frequently forgotten by the home audience.

It's an industry older than the province yet aligned to the future.

It's an industry galvanized with a purpose: to feed a growing global population while protecting the environment here at home: addressing climate change and providing a natural habitat for wildlife.

The agri-food industry is Alberta's largest employer (see Appendix A).

Alberta's agri-food sector in 2020 was a \$56 billion industry, with total sales beating that of Alberta's oil sales in 2020 (see Appendix B).

It's rural and urban; traditional and high tech, and it touches everyone.

And Alberta's agri-food industry is a platform for renewed growth - in jobs, investment, and economic development.

AT A GLANCE ...

The agri-food industry in Alberta comprises everything from farm production to food processing and beverage manufacturing, and includes grocery sales points and food services. It is everywhere and touches everyone.

Primary agriculture is the foundation of Alberta's agri-food industry. There are approximately 40,600 farms and over 50 million acres of total farmland area dedicated to crop and livestock production (Leitch 2018; Statistics Canada 2016a). In 2019, Alberta's primary agriculture sector contributed \$14.0 billion in farm cash receipts (Statistics Canada 2020a) and employed 49,000 persons (Statistics Canada 2020b). The food and beverage processing sector is the largest manufacturing employer in the province, employing 23,000 people (Uwizeyimana 2018) and accounting for \$15.5 billion in manufacturing sales (Statistics Canada 2020c).

Alberta contributes 16 per cent of Canada's primary agriculture GDP (crops and animal production) (Statistics Canada 2020d). The province's top five agriculture products are beef, canola, wheat, pork, and dairy, although peas and pulse crops are gaining ground (Statistics Canada 2020a). Alberta is also the largest honey producer in Canada, exporting this product around the world (Statistics Canada 2020e).

Alberta leads the nation in cattle inventory, accounting for more than 41 percent of Canada's total herd (Statistics Canada 2016b). Almost three quarters of Canadian beef processing occurs in this province (Carlberg 2020). The province is recognized as an experienced pork exporter of fresh and processed pork products, producing 9 percent of Canada's hogs (Statistics Canada 2020a). And Alberta is globally respected for livestock genetics including semen, embryos, and breeding stock, as well as a range of technical and consulting services.

Alberta produces about one third of Canada's total wheat and canola production, behind only Saskatchewan (Statistics Canada 2020g). Four of the world's largest vegetable oil processors have invested significant capital in the province to crush and provide value-added packaged oil, shortening and margarine (Government of Alberta 2018). And, as outlined later in this chapter, value-added processing of both crops and livestock has the potential to grow significantly in the next decade.

Alberta exported \$11.6 billion in primary and processed agri-food products in 2019 and is the third largest exporter of agri-food products in Canada, after Ontario and Saskatchewan (Chen 2020). Simply put, Alberta helps feed the world. 65 per cent of Canada's crops and 40 per cent of its livestock production are exported (Montel 2016).

During the Covid-19 crisis of 2020, Canada's exports declined year-over-year by 10 per cent. Remarkably, in this tumultuous year, Canada's primary agri-food exports grew by 10 per cent, and our food and beverage products exports grew by 5 per cent year-over-year (Statistics Canada 2020h). This is the tremendous growth potential we want to tap into.

See Appendix C, Figures 1 through 6 for more details on the province's and country's top agri-food products and exports, and its major trading partners in these products.

A FUTURE GLOBAL NEED ...

Alberta's agriculture is a success story in feeding a growing global population. In 1870, an acre of land produced ten bushels of wheat (Canada 1974). With the "green revolution" of the mid-twentieth century, advances of mechanization and selective breeding resulted in large improvements in yields. With the advent of precision agriculture methods, 2020 production yields increased over five fold from that 1870 starting point to 56 bushels per acre in the province (Statistics Canada 2020g). But more is required.

By 2050, the world is expected to be home to over nine billion people, with the largest growth in Asia and Africa. Forecasts reveal a 70 per cent increase in food production will be required to help feed the world (FAO 2009). Alberta's agri-food industry knows it must produce more and better, and do it with less – less land, less water, less inputs, and less environmental impacts. Alberta farmers and ranchers are committed to the challenge and recognize that they will play a role in producing enough food to feed the world.

Alberta's current export markets are diverse — most of our beef production goes to the United States, while our pork, wheat and canola exports reach China, Japan, Indonesia and many other markets (Chen 2020). Our eyes are focused on Asia. With 2.3 billion people predicted to comprise China and India's middle class by 2030, this market aligns with Alberta's location and logistics excellence (Hamel 2019). In addition to being a valuable market for other Alberta agri-food products, this fast-growing Asian market is demanding more protein. China's economic growth, emerging middle class and rapid urbanization are increasing beef demand, while their domestic beef production is lagging (Li, Yan and Zan 2018). The world is expected to consume more meat in 2021 than ever before. The United Nations Food and Agriculture Organization (FAO) projects that global meat consumption will rise by 12 per cent from 2019 to 2029 (FAO 2020). Alberta is poised to meet that need.

Alberta's agri-food industry is also in a strong position to serve the changing appetite of Canadians and the western world. Just as Asian developing countries are rapidly expanding demand for animal protein, developed countries, including Canada, have a strong domestic demand for meat, and in addition are increasing their demand for plant proteins (Henchion et al 2017). Consumers' habits are changing, and fast: the global market for alternative proteins is expected to grow at 14 per cent per annum by 2024, making up a third of the world protein market by then, and the global plant-based protein market is expected to reach Can\$13.1 billion by 2022 (National Research Council Canada 2019). Alberta is a major producer of beef and pork, and is the home of some of the highest quality pulses including peas, lentils and chickpeas. This makes Alberta an attractive global leader in both animal and alternative proteins.

Consumers want quality, safe, affordable, and nutritious food they can trust, and importing jurisdictions need stability and reliability in their partners. Canada's agri-food production is ranked number one for quality and safety (Global Food Security Index – Rankings and trends 2020). In addition, Canada's environmental goals continue to be prioritized in our economic recovery plan. Indeed, Canada's agriculture industry ranks highly in parameters such as nitrogen and pesticide use, compared to our OECD peers (McKittrick 2018). Alberta's agriculture industry is actively contributing to climate solutions. The sector is a global leader in zero-tillage practices, developing its biofuels industry, and using other operations practices such as a voluntary carbon offset program, rotational grazing practices, and variable rate technology for fertilizer application (Baah-Acheamfour et al 2014; Kassam and Friedrich 2010).

Alberta has an abundance of natural resources primed and waiting to tackle the increasing global demand for agriculture and agri-food products. The province's resources also include excellent universities, colleges and polytechnics, a growing innovation network, and research and development centres such as the Food Processing Development Centre in Leduc; a state-of-the-art facility designed to provide research, product development and commercialization services to local, national, and global food companies. In addition, public/industry approaches like the new Results Driven Agriculture Research (RDAR) are funding research that will benefit farmers, ranchers and consumers.

See Appendix C, Figures 7 through 9 for global forecasts for some of the province's biggest agri-food products.

A FUTURE ALBERTA VISION ...

The past decade has seen seismic shifts in how Alberta produces, consumes, and uses food and fibre. For example, drones went from expensive playthings to commodity equipment, and crop genome sequencing went from high-cost research to an affordable service. E-commerce and social media marketing allow consumers to learn about and buy food online and then have it delivered to their front door, often directly from the producer, shrinking and changing the supply chain.

The next ten years are expected to see similarly dramatic change. Improved connectivity and increased digitalization of our lives, our information, and our tools will alter how we

move agricultural products from producer to consumer. Even forces such as how people communicate through the internet will have cascading consequences for food safety and consumer behaviour as they shape data flows and inform decision-making.

Currently, a dominant narrative in agriculture is around precision agriculture and digital farming. While the seeds of this young segment of agriculture were planted in the 2010s, it will blossom in the 2020s. With mega-companies now entering the industry, led by Canadian leaders such as TELUS Agriculture and Nutrien, new digital infrastructure is providing a foundation for innovative solutions. The connected farm is the farm of the future – everything will be connected: bins, shops, trucks, farm equipment, moisture probes, weather stations and beyond. This opens new opportunities for data and information consultants, new means of applying crop inputs, and greater precision for grain marketing, crop insurance and financing. The market for the agriculture Internet of Things (“IoT”) is expected to grow to USD \$20.9 billion (Can\$25.2 Billion) by 2024 (Agriculture IoT Market Worth \$20.9 Billion by 2024 – Exclusive Report by MarketsandMarkets 2019), and Alberta’s budding technology ecosystem, led by the Smart Farm at Olds College, is gaining global recognition.

What are other mega-trends changing the face of agri-food? Consolidation – farms, ag-tech companies, retailers, manufacturers – is expected to continue. This leads to a need for ever more business savvy with a laser focus on finances and operational efficiencies.

Biologicals meant to replace synthetic chemicals, and to enhance crop and animal production, are in their early stages of commercialization. Many of these intriguing new technologies come from smaller companies and university labs. Alberta has a number of these innovative companies and with initiatives like the Creative Destructive Lab – Rockies, they are capturing the interest of larger global firms. That’s one of the reasons that global accelerators like THRIVE have chosen Alberta as home for their Canadian activities.

Production practices on farms and ranches are continually adapting. Soil health is a high priority. Alberta led the way with zero tillage practices starting in the 1970s. Banding fertilizer to maximize efficiency and minimize nutrient loss originated in Alberta. Today, rotational grazing is extensively practiced on beef cattle and bison operations. And while ‘regenerative agriculture’ is a relatively new term, and more cover crops and biodiversity practices are being included, in many ways this is just an extension of modern agriculture adjustments that have been occurring for generations.

Major food companies and food retailers are influencing the future of the farm and the entire food supply chain. Food companies, reflecting the desires of consumers while marketing opportunities to differentiate, are demanding greater traceability and data on how food is produced. Technology plays a key role and technologies like AI, quantum computing, augmented reality, sensor technology, robotics and blockchains are advancing quickly. They are also seen as a means of improving efficiency and assisting with labour attraction challenges and enterprise profitability.

Changing consumer eating habits and their desire for new food products are opening new doors for Alberta’s agri-food industry. Plant-based foods are increasing in demand. Vertical farming and greenhouses, in both urban and rural areas, have a tremendous

potential to replace imported produce, vegetables and fruit. And new protein ventures like indoor fish farms and insect farms are emerging in Alberta. Although only a small part of the province's agriculture sector since its legalization, the cannabis market impact on GDP more than doubled from 2018 to 2019 and continues to grow (Statistics Canada 2020d). And certified organic farms, while currently representing a very small percentage of Alberta farms, increased in number by over 30 per cent from 2011 to 2016 (Statistics Canada 2016c).

The interest and demand for clean energy is also taking root, and farmers are participating. Take a drive and look at the number of solar panels on farms today — for their own use and to add to the grid. Bio-digestors turning waste into energy are not uncommon. Seed companies are adjusting genetics to develop crop varieties that deliver enhanced biofuel potential.

And all this is attracting the attention of investors — local and international, private equity and venture capital. The agri-food industry is hot. The speed of change is rapid. For those thinking agriculture involves images of their 'grandparents' farm, much has changed!

OPPORTUNITIES

The twenty-first century is the agri-food industry's time to shine, and Canada — and more specifically Alberta — is sitting in an ideal position to lead and capitalize. The industry is broad, diverse, and full of potential, both for new graduates looking to for an exciting career and those with experience in other industries looking to transition.

The agri-food industry is poised for significant growth — growth in jobs, investment, economic activity, and a positive solution to issues important to Canadians and global consumers. Alberta has the building blocks to be a global mega-power: abundant natural resources, a strong network of research and development facilities, one of the lowest users of pesticides per-hectare regions in the world, political stability, and goodwill to encourage investment, a growing primary and secondary processing sector, a respected regulatory system, and access to a sophisticated, ethnically diverse consumer base.

In this changing and dynamic world, Alberta's land, water, air, cold winters, and natural resources provide a foundation of strength. Our entrepreneurial background, reputation for excellence, regulatory standards, and the sophistication of our industry players are further building blocks. When properly nurtured with enhanced technology and focused investment, growth and success will be the outcome.

The number of opportunities is extensive — here are three for consideration, developed by the Agriculture and Forestry Sector Table for the Economic Recovery Council in 2020 (Strategic Action Plan 2020):

VALUE-ADDED PROCESSING

The greatest positive impact on Alberta's economy comes from adding value to its commodities. Whether creating fertilizer from natural gas, turning peas into protein, or processing livestock into food products or pet food, there is value and jobs growth

waiting to be unleashed. Alberta food processing and manufacturing comprised 19 per cent of the total agri-food sector GDP for 2019, and grew at an annual rate of 2.8 per cent from 2010 to 2019, almost double the average growth rate of Alberta's non-oil and gas industry sectors for that period (Statistics Canada 2019). With this high growth rate, the sector has real potential to help kickstart the flagging Alberta economy in 2021.

It starts with seeing the opportunities; look at the many food and consumer products that begin with quality Alberta agriculture raw materials — think pasta, beer, prosciutto. Then consider imports where modern technology and legislative tweaks allow Alberta companies to offer superior quality and price-competitive products — think strawberries, tomatoes, lettuce. And imagine what could be done through improved value-chain integration with the province's natural gas resources (Government of Alberta 2020) and access to water into new agri-food investments like greenhouses, processing plants, making your own electricity, and establishing new industries and products from production and food waste. Then 'without any compromise' we reduce red tape, unleash the entrepreneurs, and watch the creativity of the investors from this almost zero-cost government investment.

CAPITALIZE ON THE SUSTAINABLE ECONOMY

Agriculture and forestry hold the secret to carbon capture and a positive solution to climate change. Alberta, with experience in carbon markets and agriculture-focused carbon offset systems, is in a position to lead in an emerging, high-growth, international carbon market. The global carbon offset market is valued at \$50 billion, to potentially as high as \$800 billion (Pollitt 2019).

Alberta now has the opportunity to lead the way in longer-term sustainability goals, through the conceptualization of a larger carbon market for North America, anchored not only in Alberta's heavy industry and agriculture, but potentially other trading jurisdictions as well. The role of agriculture emissions reductions through large scale sequestration and optimization of technologies and measurement protocols will be key in the development of this carbon offset market. The Government of Alberta has taken the initial steps in exploring this value proposition with the *Carbon Program*, recently launched by the Simpson Centre for Agricultural and Food Innovation and Public Education (School of Public Policy 2021). The Carbon Program's mandate consists of detailed measurement of Alberta's agriculture industry greenhouse gas emissions, in addition to developing policy recommendations that will reduce overall emissions: this will include a close look at the carbon sequestration potential of agriculture operations. Not only does this attract investment, but the sustainable economy will deliver another income stream for Alberta farmers, ranchers and the agribusiness community while respecting and enhancing our land, water and air.

CATALYZING TRADE AND EXPORTS

Trade and exports play a cornerstone role in the present and future of Alberta's agri-food industry. As noted earlier (see also Appendix C), global demand for agriculture and agri-food products are forecast to continue to grow substantially to 2050 and beyond.

Canada is a partner in the CPTPP (Comprehensive and Progressive Agreement for Trans-Pacific Partnership) with some of its major trading partners such as Japan and Malaysia. Canada is also a party to USMCA (United States Mexico Canada Agreement) and CETA (Canada-European Union Comprehensive Economic and Trade Agreement). However, preferential trade agreements with two of Canada's largest potential export markets – China and India – do not yet exist. With the groundwork laid by its current trading position with those entities, Alberta has the opportunity to seek enhancements to existing trade volumes and relationships.

Alberta can also take advantage of opportunities created by countries that have chosen to change their export strategies due to market volatility and Covid concerns (Yeung and Kerr 2021).

By being strategic, proactive, and investing to support our strengths, Alberta's growth in trade and exports hold potential for double digit growth.

CHALLENGES AND OBSTACLES

Where there is opportunity, there are also challenges. Some of the larger challenges are summarized below:

REGULATORY HURDLES AND STIMULATING INVESTMENT

Canada's food safety and quality are excellent, but now that has to be combined with efficiency of regulation to enable the industry to take off and lead the way in economic recovery. Modernization is required at the national, provincial, and municipal levels. British Columbia recently started a modernization process of its meat production and processing regulations (Province of British Columbia 2020), and Saskatchewan makes regular regulatory modernization efforts as well (Government of Saskatchewan 2021). Alberta now has to focus its own *Cutting Red Tape* effort specifically on the agriculture and agri-food industry, including areas such as regulations for small scale meat processors, streamlining and coordination of the business and environmental aspects of food processing sector applications to name a few (Government of Alberta 2021a). Streamlining application processes can reduce risk and uncertainty for investors, making Alberta more attractive as an investment choice.

Industry growth rate is tied to regulatory environment and investment risk. Many aspects of the agriculture industry are capital intensive, and while investor interest in the agri-food industry is strong and growing, Alberta can do more to create the proper investment environment and take actions that will stimulate investment. Canada is currently ranked twenty-third in the World Bank's *Ease of Doing Business rankings*, while New Zealand, the United States and Australia all rank higher (World Bank 2021). Alberta has to take some innovative approaches to enhancing its investment conditions.

Alberta, and Canada, have seen consolidation in many aspects of the agri-food industry due in part to many policies that encouraged this (Carlberg 2020; Fawcett-Atkinson 2021). In addition to a favourable corporate tax rate (Government of Alberta 2021b), Alberta can enhance its investment climate for value-added processing, bio-products,

and ag-tech development, as other provinces have already done (Fawcett-Atkinson 2021; Government of Nova Scotia 2021; Government of Ontario 2021).

RURAL CONNECTIVITY

Agriculture is increasingly dependent on technology and the industry's success relies on connectivity. High speed technology with ample broadband width is needed to unleash connectivity and enable rural Albertans and businesses to participate, perform and capitalize on twenty-first century opportunities.

The Covid crisis highlighted the need for reliable high speed internet services for all Albertans. Currently, 87 per cent of Canadian households and businesses have reached the Canadian Radio-television and Telecommunications Commission (CRTC) performance parameters (CRTC 2021). However, this is true for only 46 per cent of rural communities. Broadband development is progressing at slower than anticipated rates, and this lack of broadband comes at a cost when considering application of various precision agriculture systems which rely on connectivity and big data (Mark 2016). In addition, Canada has the least competitive prices for its internet services when compared globally (Digital Fuel Monitor 2020). A recent study showed the critical nature of broadband to the agriculture industry, estimating a potential gain of 18 per cent in U.S. market value if access to broadband and adoption of digital agriculture were better matched to producer demand (Nelson 2019).

The speed at which Alberta can improve its broadband coverage into its rural areas directly affects the ability of Alberta farmers and ranchers to employ AI technologies, sensor use, and other precision agriculture automation applications — faster implementation will accelerate economic growth.

LABOUR

Labour is a challenge for the agri-food processing sector and to a lesser degree, primary agriculture. This challenge was flagged in the Barton Report (Barton 2017). This challenge can be addressed through a combination of training and re-training, robotics, technology and immigration.

The COVID-19 pandemic exposed weaknesses in Canada's Temporary Foreign Worker (TFW) program, highlighting Canada's dependence on the constant seasonal use of TFW labour for over fifty years, and how this labour force is really a permanent part of the industry (Falconer 2020). This reinforces the need for more workers, with the industry currently constrained due to a lack of labour. New measures such as higher immigration targets can help mitigate these constraints.

CHAMPION AGRI-FOOD AND TACKLE MISINFORMATION

Alberta's agri-food industry is a well-kept secret. This needs to change if the province, nation, and industry are going to achieve their full potential. Agri-food is a growth industry that should be attracting Canada's brightest young minds, substantially more investment, and the respect of political and corporate leaders. When awareness is elevated, both domestic and international benefits will be realized.

The 2017 Barton Report (Barton 2017) drew public attention to the untapped growth potential of Canada's agri-food industry. When the pandemic hit in 2020, the agri-food sector was deemed an essential service. Both have elevated the industry's impact on Canadian socio-economic prosperity which has been quietly taken for granted. Now Alberta's agriculture sector has the potential to transform and become a "super sector," with a singular focus on sustainable socio-economic growth that is integrated throughout all aspects of our lives (McInnes 2019). In conjunction with the business recommendations captured in the Barton Report, a major, focused outreach program including opportunities for dialogue and two-way communication can raise the sector's profile and frame it to appeal to more Albertans (Wilk et al 2014). Albertans, Canadians and the world are encouraged to see what the province's agri-food industry is delivering: take a virtual or in-person tour of how to turn Alberta wheat into branded pasta; how grazing practices are enhancing grasslands and sequestering greater amounts of carbon; experience the technology of the Olds College 'Smart Farm' or robot vegetable production in Coaldale and prosciutto in Acme.

Indeed, one of the challenges faced by industry is that the primary agriculture sector employs only 2.1 per cent of Albertans — the distance from our food to our plate has never been so great (Statistics Canada 2020b). A positive messaging campaign can be the purveyor of little-known agri-food industry facts for Albertans, and will help to share knowledge about our domestic and global food system with the general public. High profile, trusted, non-partisan messengers can help to facilitate this dialogue, influencing and capturing consumer interest, doing so by targeting specific food issues rather than painting with a broad brush (Jerit and Zhao 2020). The agri-food community recognizes the importance of working collectively and collaboratively with industry and governments to address misinformation and elevate the profile, awareness, and opportunities the industry provides.

RISING TO THE OPPORTUNITIES

Strategic. Action. Plan. (Agriculture and Forestry Sector Table 2020) These three ingredients pave the path for Alberta's agri-food success. The *Strategy* calls for alignment with two significant global drivers: the heightened importance of a trusted and reliable source for food security, *and* the consumer's demand for a sustainable economy. The *Actions* needed include a number of coordinated, specific tasks on the policy front designed to enhance economic growth and remove barriers. The *Plan* involves aligning the *Actions* with the *Strategy*, and combining the ABCs (Agile, Bold and Creative) to deliver job creation, investment and economic activity benefits while protecting and nurturing our natural resources for future generations.

From a strategic perspective, Alberta can play a leadership role by encouraging Canada to provide the right business conditions to advance these opportunities: through regulatory reform; by reducing interprovincial trade barriers, including harmonization of standards and licensing requirements for skilled labour and equipment; and by introducing clearer and more accessible metrics, measurements, and market information.

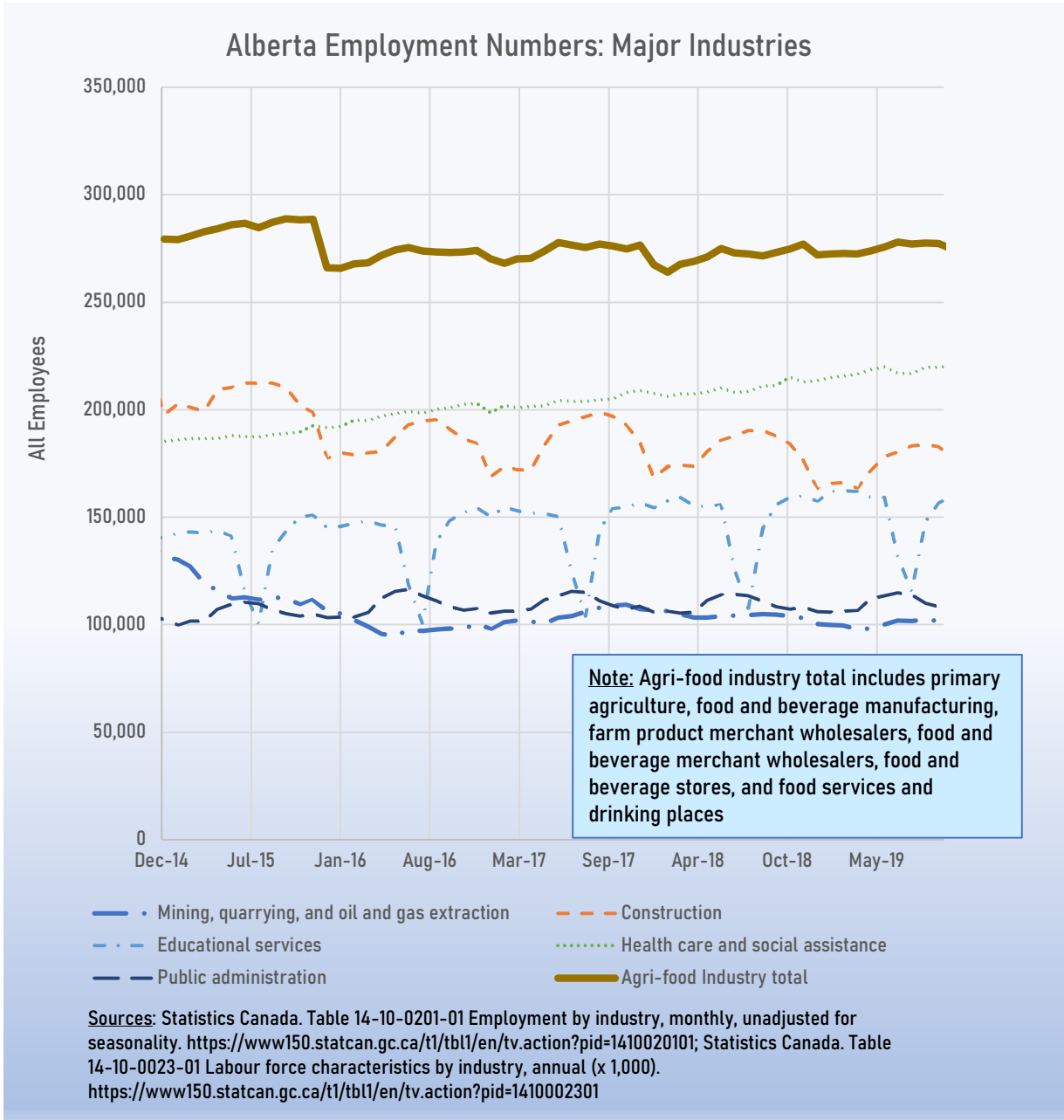
Longer term strategies that will impact the province's agri-food system efficiencies and connectivity to markets include national projects such as the Canadian Northern Corridor, a multimodal corridor linking Northern and near-Northern Canada from east to west, and providing an integrated connector for transport of energy, goods, electricity and people (Fellows et al. 2020).

Today, much of Alberta's agri-food industry is commodity-centric. More than half of all crops and livestock products are exported to another country to be processed, and then finished products are imported back here for sale. Jobs and economic value will grow by increasing ingredient processing within Alberta, with a goal of moving to branded food manufacturing. And along the way there is ample opportunity for the development of new by-product manufacturing, such as bioplastics made from crop starches.

Progress and performance start with a plan, and Alberta's agri-food industry will benefit greatly from a plan that spans beyond election cycles and involves the collective minds of industry and government. The plan needs to align to Alberta's natural advantages while reflecting opportunities, expectations, and limitations. Innovation and collaboration are critical and needs to be encouraged in all components of the supply chain. These will improve efficiency and profitability and elevate the perception and reputation of the industry and the Province.

And finally, the plan needs to be implemented with excellence. When that occurs, the industry is stronger, the benefits are realized, and Alberta's gentle giant awakens.

APPENDIX A:



APPENDIX B: ALBERTA AGRI-FOOD INDUSTRY TOTAL SALES IN 2020 COMPARED TO ALBERTA GROSS CRUDE OIL SALES, 2020 AND HISTORICAL

Agri-food Industry Total Sales	2020 Sales, Can\$ Billions
Farm cash receipts [1]	\$ 14.26
Food manufacturing [2]	\$ 15.48
Beverage manufacturing [3]	\$ 1.07
Pesticide, fertilizer and other agricultural chemical manufacturing [3]	\$ 2.06
Food and Beverage retail [3]	\$ 16.64
Food service [4]	\$ 7.47
TOTAL	\$ 56.96

Sources:

[1] Statistics Canada. Table 32-10-0045-01 Farm cash receipts, annual (x 1,000)
<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3210004501>

[2] Statistics Canada. Table 16-10-0048-01 Manufacturing sales by industry and province, monthly (dollars unless otherwise noted) (x 1,000)
<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1610004801>

[3] Statistics Canada Data from Mr. Kyle Burak, Senior Economist, FCC - personal communication May 6, 2021

[4] Statistics Canada. Table 21-10-0019-01 Monthly survey of food services and drinking places (x 1,000)
<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2110001901>

Alberta Gross Crude Oil Sales

Year	Alberta Total MMbbl	Avg MMbopd	Avg Price, \$/bbl	Can\$ billions
2016	1046.09	2.87	33.26	34.79
2017	1142.12	3.13	42.52	48.56
2018	1244.78	3.41	47.76	59.45
2019	1257.16	3.44	48.29	60.71
2020	1196.19	3.28	32.77	39.20

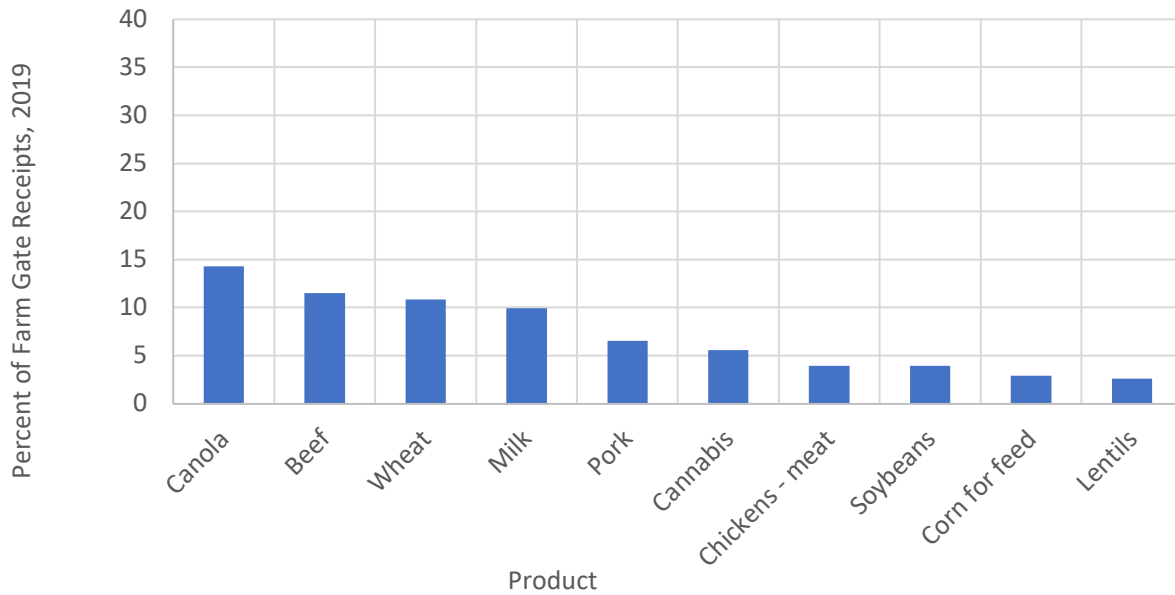
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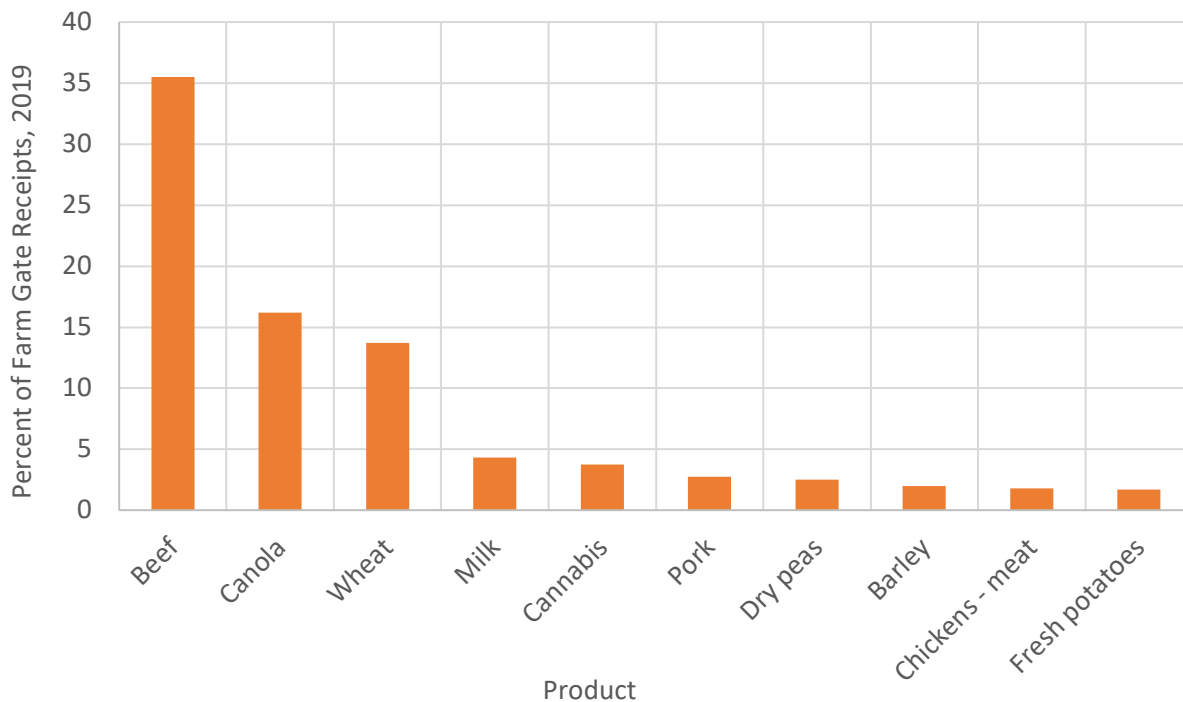
APPENDIX C:

Figure No. 1: Canada: Top Agriculture Sector Products - by Farm Gate Receipts 2019



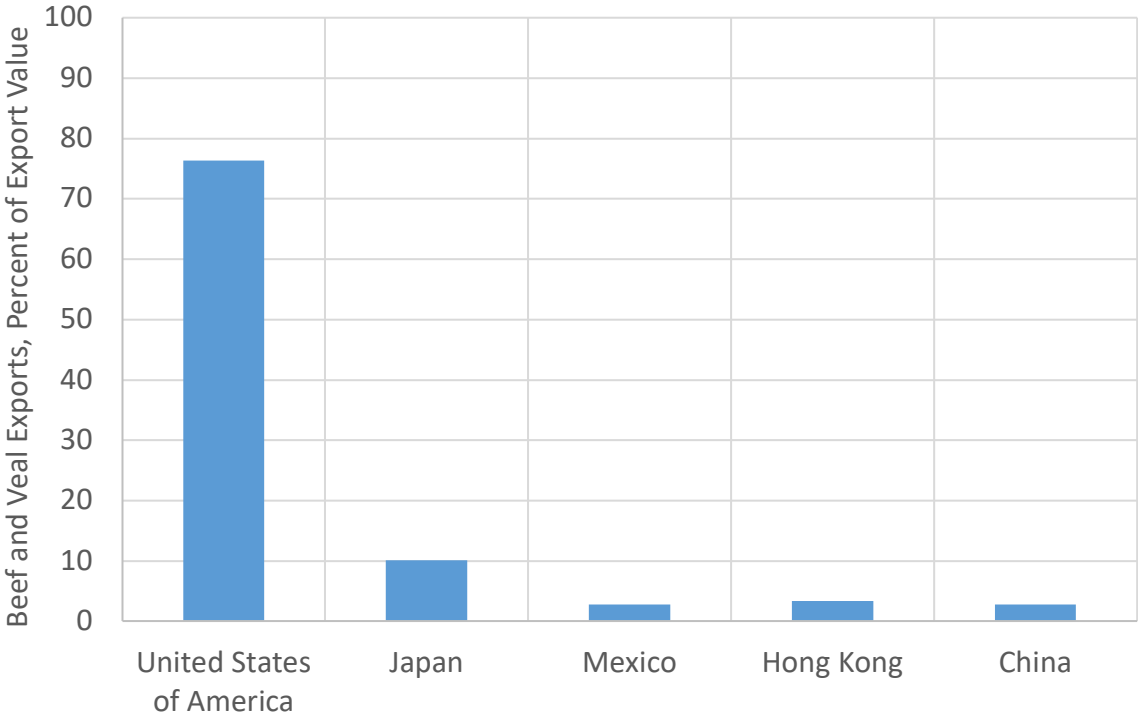
Source: Statistics Canada. Table 32-10-0045-01 Farm cash receipts, annual (x 1,000).
<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3210004501>

Figure No. 2: Alberta: Top Agriculture Sector Products - by Farm Gate Receipts 2019



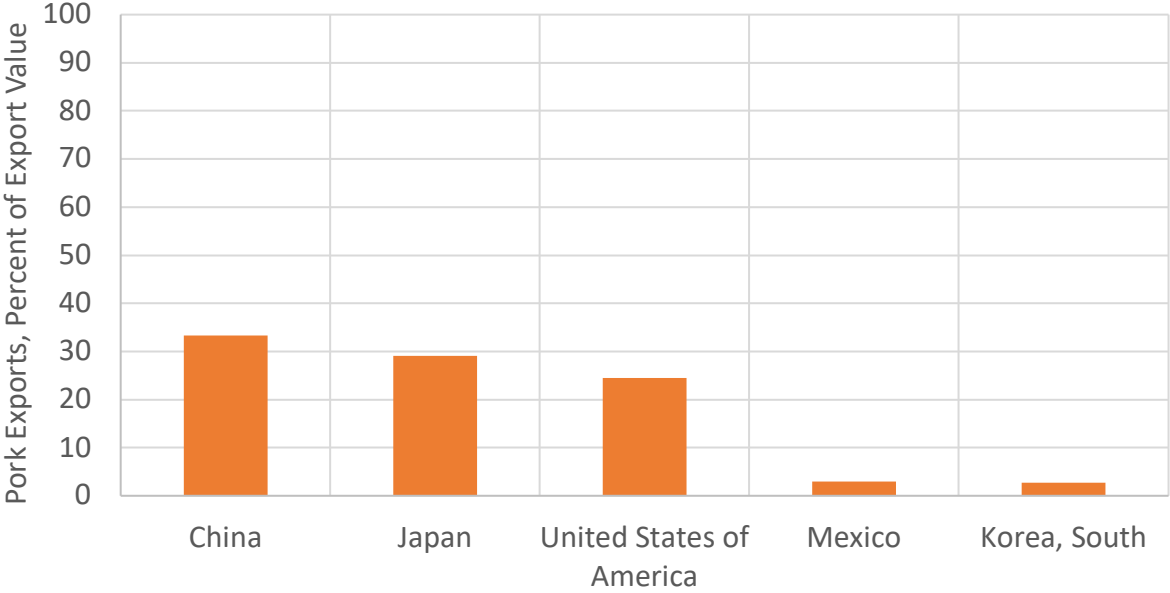
Source: Statistics Canada. Table 32-10-0045-01 Farm cash receipts, annual (x 1,000).
<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3210004501>

Figure No. 3: Canada Beef and Veal Exports - Top Five Countries, Jan. - Aug. 2020



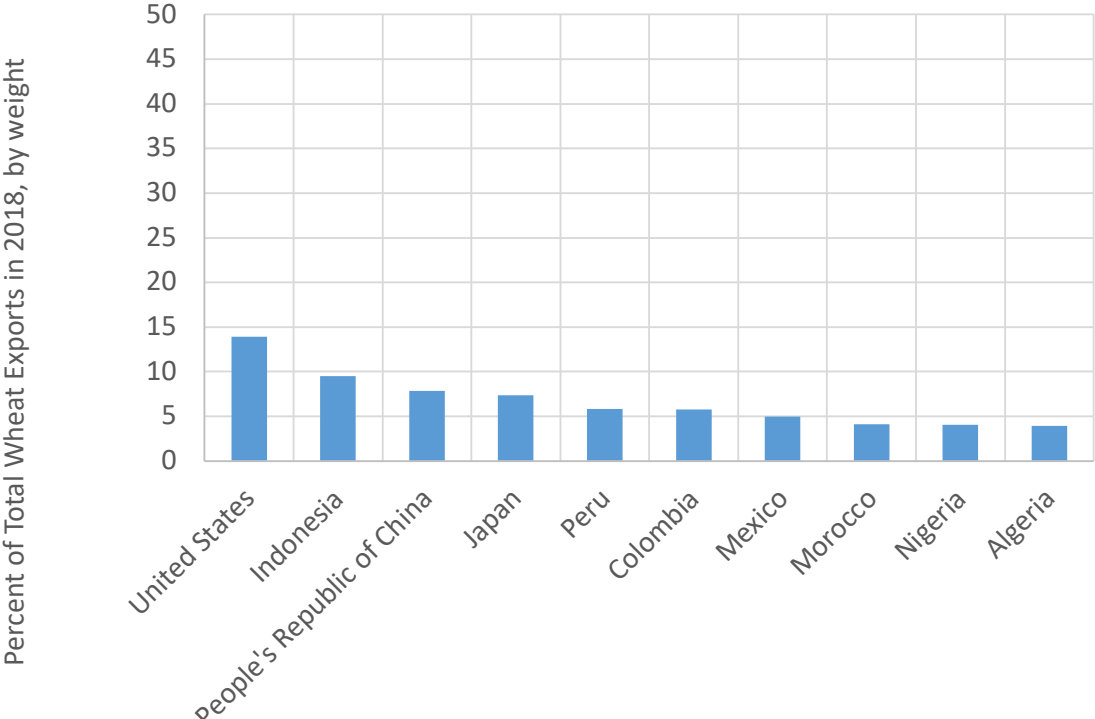
Source: "Red meat exports by country - year to date cumulative," Agriculture and Agri-Food Canada, page accessed 2020-10-26. <https://www.agr.gc.ca/eng/animal-industry/red-meat-and-livestock-market-information/exports/red-meat-exports-by-country/?id=1419965032803>

Figure No. 4: Canada Pork Exports - Top Five Countries, Jan. - Aug. 2020



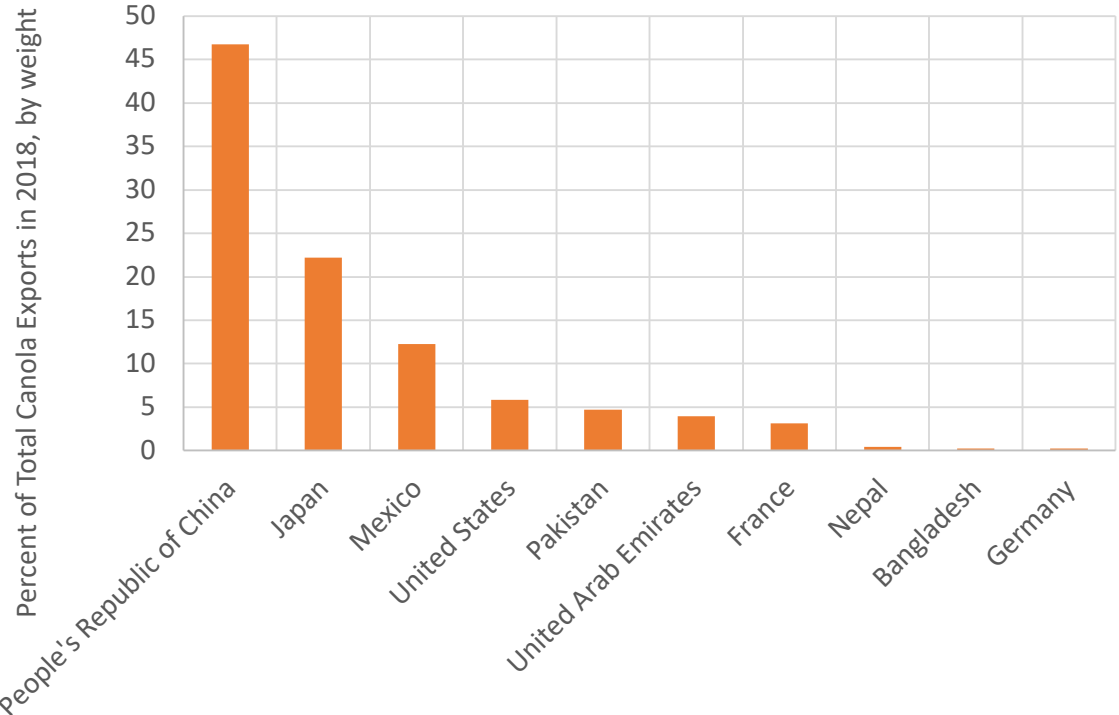
Source: "Red meat exports by country - year to date cumulative," Agriculture and Agri-Food Canada, page accessed 2020-10-26. <https://www.agr.gc.ca/eng/animal-industry/red-meat-and-livestock-market-information/exports/red-meat-exports-by-country/?id=1419965032803>

Figure No. 5: Canada Wheat Exports – Top Ten Countries 2018



Source: Statistics Canada. Table 32-10-0008-01 Exports of grains, by final destination. <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3210000801>

Figure No. 6: Canada Canola Exports – Top Ten Countries 2018



Source: Statistics Canada. Table 32-10-0008-01 Exports of grains, by final destination. <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3210000801>

Figure No. 7: OECD-FAO Global Consumption Forecast: Wheat

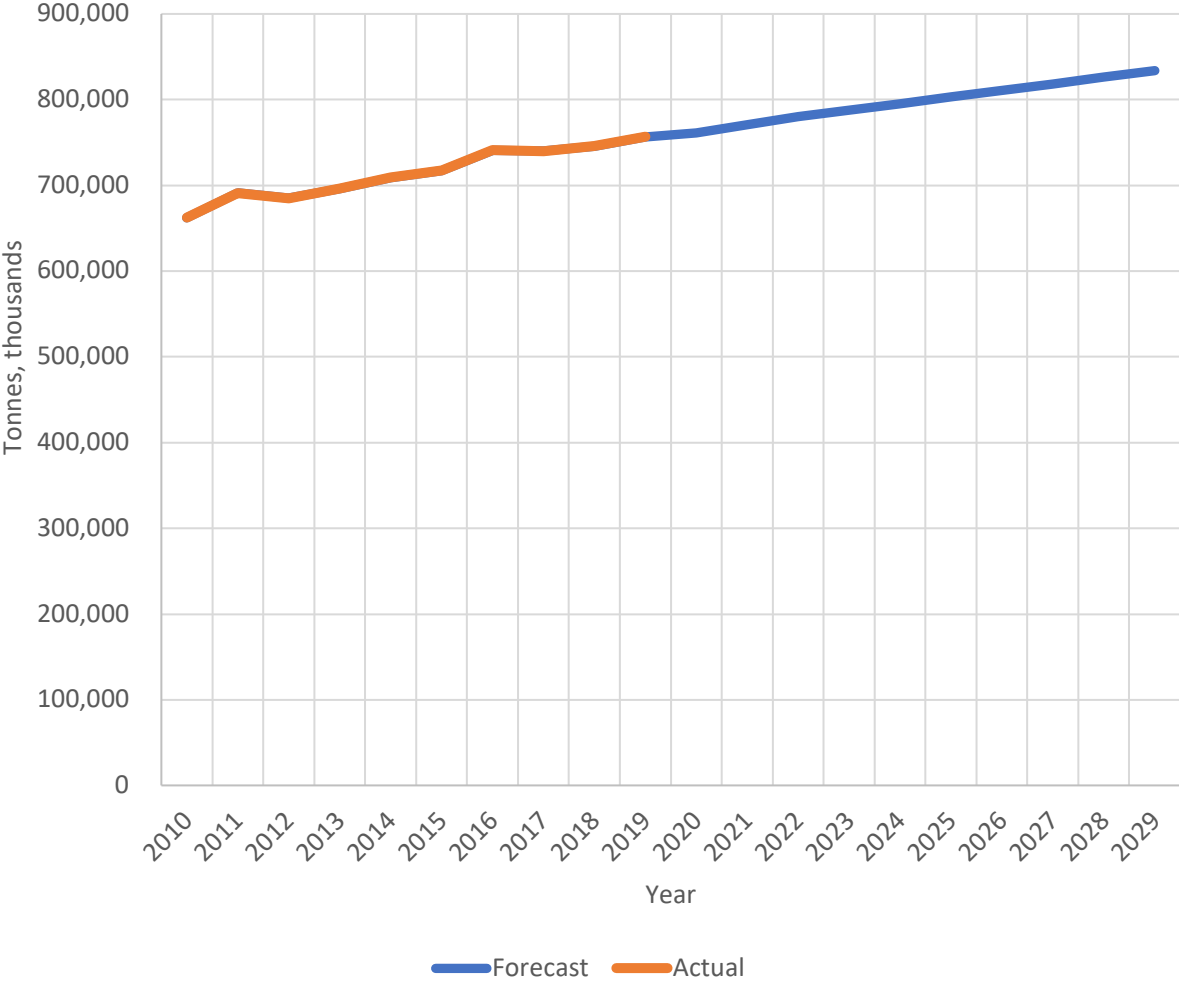


Figure No. 8: OECD-FAO Global Consumption Forecast: Beef and Veal

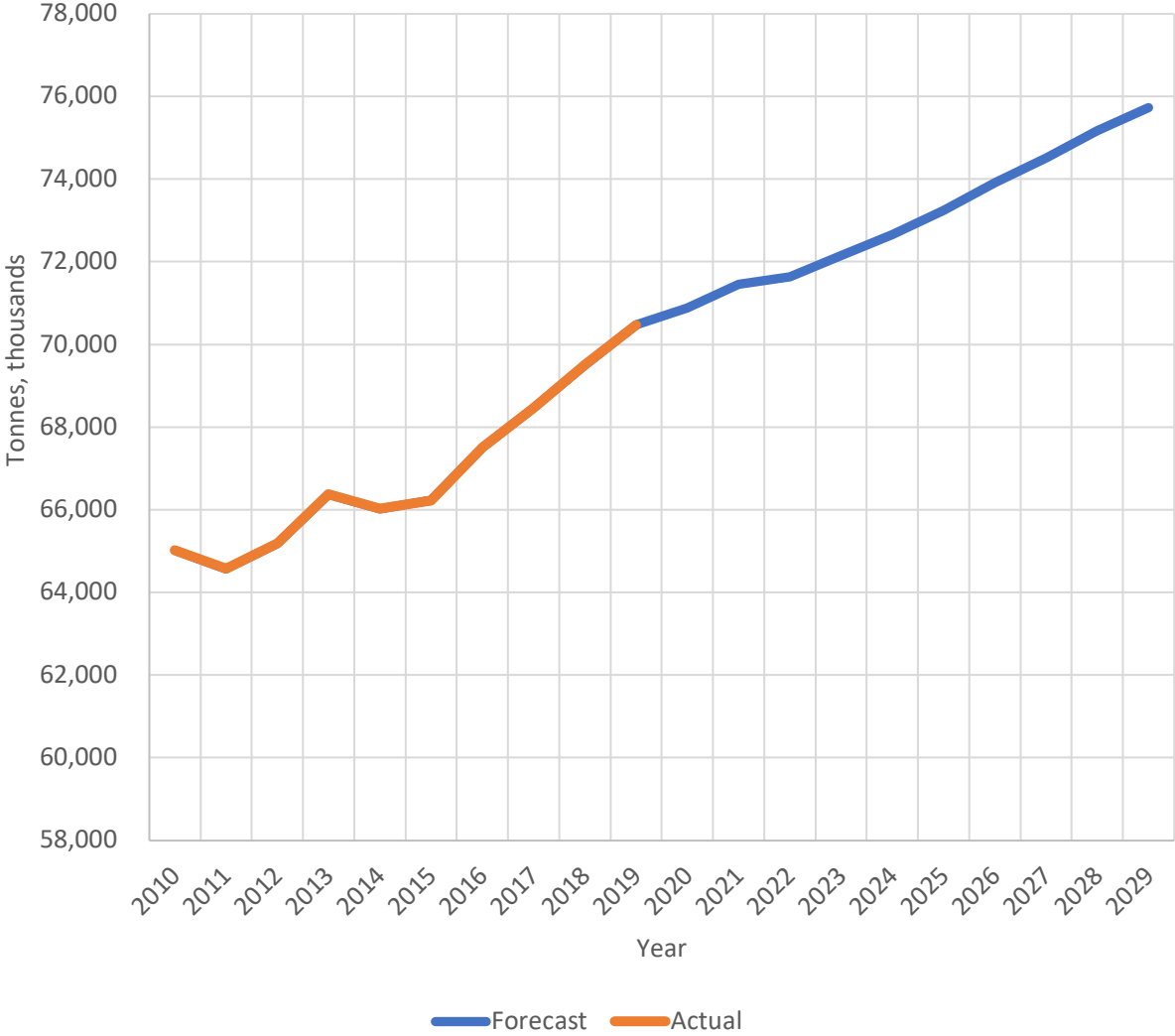
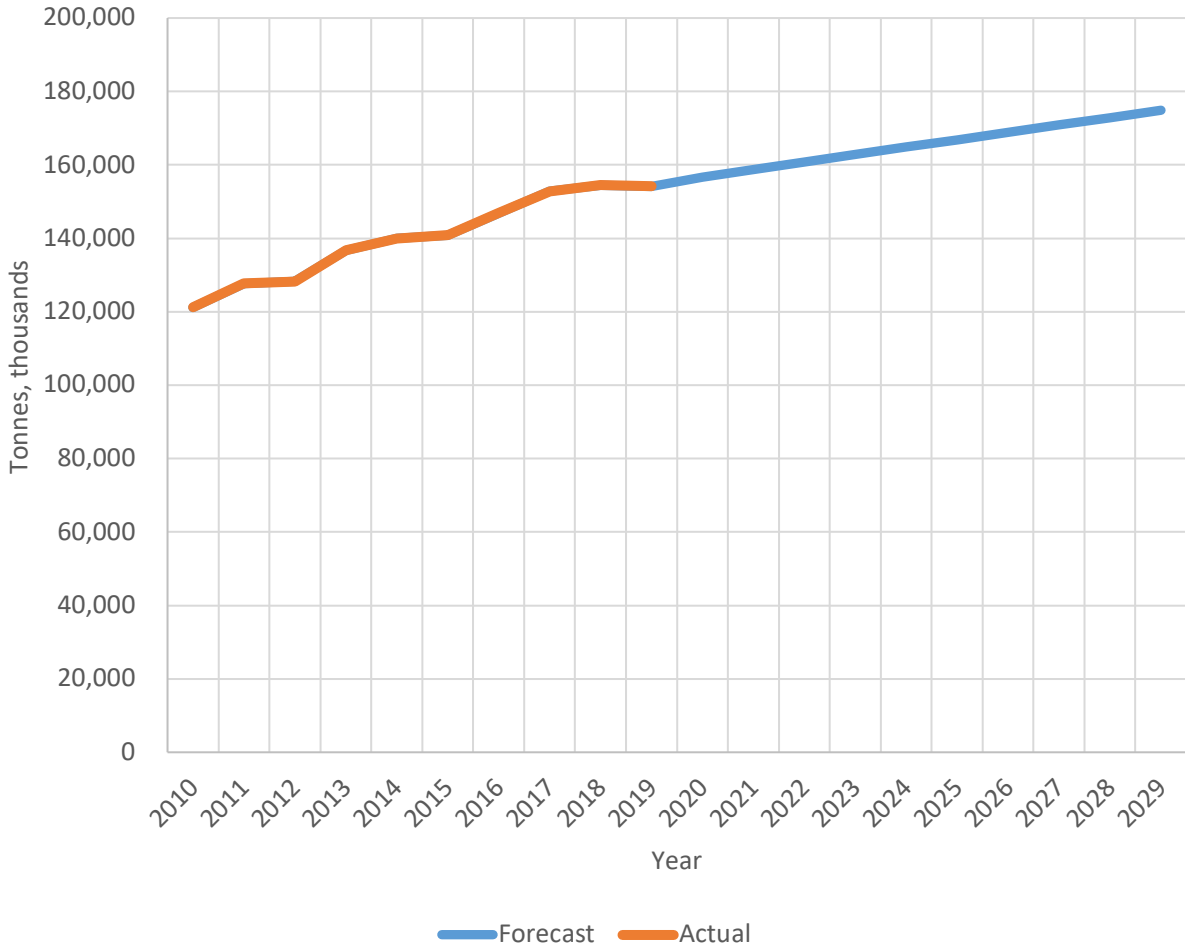


Figure No. 9: OECD-FAO Global Consumption Forecast: Oilseeds other than Soybean



Source: "OECD-FAO Agricultural Outlook," Accessed 2021-04-23.
https://stats.oecd.org/viewhtml.aspx?datasetcode=HIGH_AGLINK_2020&lang=en

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CHAPTER 13

THE FISCAL CHALLENGES FACING ALBERTA'S MUNICIPALITIES

Bev Dahlby and Melville McMillan

1. INTRODUCTION

A series of shocks—the decline in oil and gas prices and pandemic-related disruptions to economic activity and employment—have buffeted the Alberta economy and taken a toll on the provincial government’s finances. The Government of Alberta has a structural deficit, exacerbated by pandemic-related expenditures and revenue reductions. Given the increase in provincial government debt, its pre-existing structural fiscal imbalance, and the prospects for slower rates of economic growth, Albertans are facing a lengthy period of fiscal restraint.

While the media have focused on the provincial government’s financial situation, the downturn in the economy and the provincial government’s fiscal adjustments will have important implications for municipal governments in Alberta. Prior to the pandemic, the balance between residential and non-residential property and business taxes had become an issue, especially in Calgary. Further, the oil and gas industry has voiced concerns about the heavy property tax burden levied by rural municipalities. Conversely, the rural municipalities have complained that some oil and gas companies have stopped paying their property taxes altogether.

Given space constraints, we are unable to deal with the full range of fiscal issues that municipal governments are facing because of the downturn in the economy and the reduced prospects for economic growth. Accordingly, we will focus on two issues—the balance between residential and non-residential taxes, especially in Alberta’s cities, and the taxes on linear property that the rural municipalities levy on the oil and gas property. An appreciation and understanding of the larger context in which all municipalities operate is important, and we begin with an overview of the municipal governments’ expenditure responsibilities, revenue sources, assets, and debt levels.

2. MUNICIPAL RESPONSIBILITIES AND EXPENDITURES

Municipal governments provide numerous goods and services vital to the liveability and commercial success of their communities. Several activities come to mind immediately: roads and streets, fire (and often police) protection, waste management, recreational facilities. Such services are costly and require considerable resources. As such, they are the main focus of our attention in this overview.¹

¹

In Alberta, the roles of municipalities (in particular their purposes, powers and capacity) are defined by the *Municipal Government Act* https://www.qp.alberta.ca/1266.cfm?page=m26.cfm&leg_type=Acts&isbncln=9780779823567. Note that while the major financial functions and levies stand out, the municipal power to regulate via bylaws is also an important tool in managing activities for community wellbeing, although it is one largely neglected here.

An initial and brief comparative perspective on municipal functions is provided by Statistics Canada data.² Looking at the Alberta data for 2019, the distribution of expenses by function was: general public service (17.4 per cent), public order and safety (16.9 per cent), economic affairs (27.4 per cent), environmental protection (9.3 per cent), housing and community amenities (10.6 per cent), health (0.4 per cent), recreation/culture (15.1 per cent), and social protection (2.9 per cent). These allocations were quite stable over the prior decade. Alberta's allocation across functions is quite similar to the averages across the nine other provinces other than that economic affairs (i.e., primarily transportation) is highest in Alberta. Notable differences among the provinces are that social protection represents about 24 per cent of expenses in Ontario (and 4.2 per cent in Quebec) versus essentially zero elsewhere, Nova Scotia's municipalities contribute to education (4.6 per cent), and Nova Scotia and Ontario municipalities have just over five per cent of expenses allocated to health. It is unusual for provinces to require that municipalities contribute to social protection, education or health, which are customarily provincial functions.³

Data from Alberta's municipal financial information returns for 2019 provides more detailed information.⁴ The distribution of expenses among functions is general government (14.2 per cent), protective services (17.5 per cent), transportation (29.7 per cent), environmental (water and waste, 13.5 per cent), health and welfare (2.1 per cent), planning and development (7.0 per cent), recreation and culture (13.2 per cent), gas and electric (2.5 per cent),⁵ and other (0.3 per cent). Transportation, protection, water and waste, and recreation and culture are the big-ticket items accounting for essentially three-quarters of municipal expenses. Also, for municipalities generally, capital costs are large.⁶ Amortization accounts for almost 20 per cent of expenses but outlays on new capital purchases are 1.8 times amortization and are therefore a major demand on resources. Transportation accounts for over half (55 per cent) of capital purchases. With water/waste and other environmental (21 per cent) and recreational/cultural (10 per cent), these three areas represent 86 per cent of capital purchases.

Averages provide a useful summary characterization of municipalities in Alberta but there are considerable differences by type of municipality that must be recognized. Alberta identifies seven types of municipalities. They are (with population share) cities (70.7 per cent), specialized municipalities (5.8 per cent), municipal districts/counties (11.2 per cent), towns (11.1 per cent), villages (0.87 per cent), summer villages (0.12 per

²

See Table 10-10-0024-01. These data are for municipal and other local general purpose administrations (e.g., regional service commissions, library districts, recreational boards). The expenditures reported do not include outlays for capital (or for its amortization). The functions noted are not as detailed as those available from the Alberta municipal data that will be examined later. While having certain limitations, these data provide a convenient insight to trends and to some inter-provincial comparisons.

³

For further insight on municipal government across Canada see McMillan (2006)

⁴

See Municipal Financial and Statistical Data <https://open.alberta.ca/opendata/municipal-financial-and-statistical-data>. These data on expenses cover more functional areas and the expenses include amortization of capital.

⁵

Not included in gas and electricity are the operations of municipally owned enterprises.

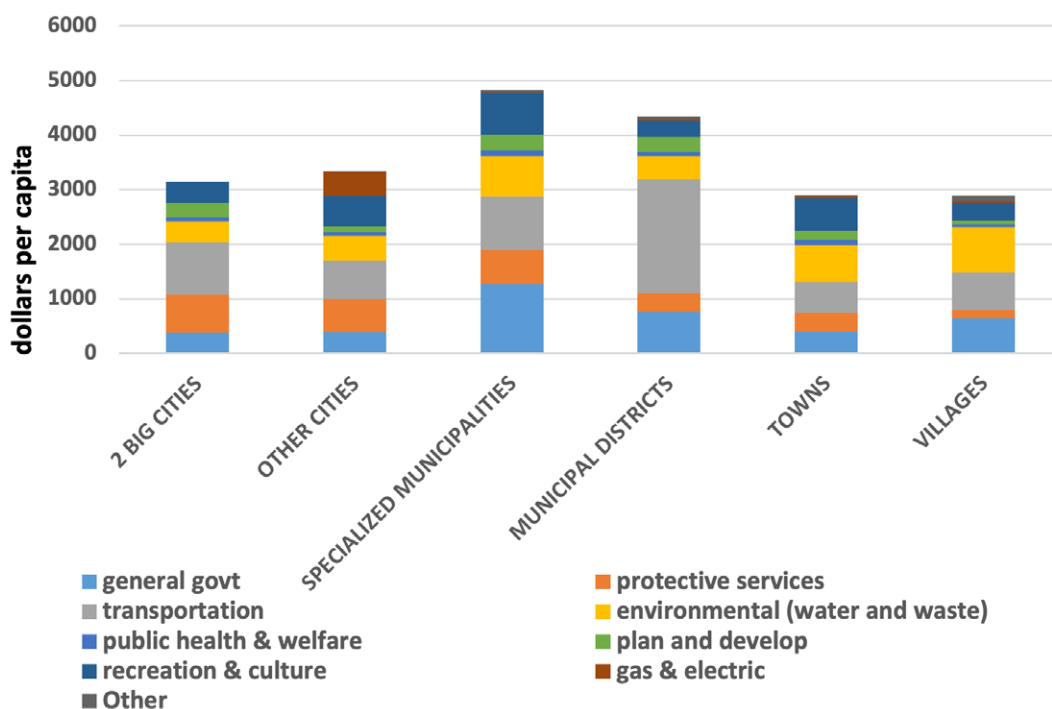
⁶

Municipal capital accounts for more than half the public sector capital stock.

cent) and improvement districts and special area (0.16 per cent). The two largest cities, Calgary and Edmonton, are home to 54 per cent of the municipal (and three-fourths of the cities') population.⁷

The demands for municipal services differ substantially among municipal types. For example, cities have interest in public transit while rural municipalities focus on roads. Some insight into the inter-municipal variation in functions is provided in Figure 1 which reports for the various types of municipalities the per capita expenses by function.⁸ An initial feature to note is that total per capita expenses are considerably greater in the specialized municipalities and in the rural municipalities than in the cities, towns and villages. Also, expenses appear lower in Calgary and Edmonton compared to the other cities but unlike the other cities, the two large cities do not report gas and electricity outlays (in part because some utility services are operated as separate municipally owned enterprises).

Figure 1. Per Capita Expenses by Function and Municipal Type, 2019



Source: Alberta Municipal Affairs, Municipal Financial and Statistical

⁷ One should also be aware of often considerable differences within municipality types. The two large cities are notable but differences occur among other types. Specialized municipalities are an important case. That group of six municipalities include Crowsnest Pass, Lac La Biche and Mackenzie County which are rural but include urban centres; the Municipality of Jasper; Strathcona County which includes the “hamlet” of Sherwood Park; and the Regional Municipality of Wood Buffalo which includes Fort McMurray.

⁸ The summer villages and improvement districts are omitted but cities are divided into the two large cities and other cities.

The per capita expenses of the various functions also vary considerably among the municipal types. General government costs are particularly large in the specialized municipalities and the municipal districts while protective services are greater in the cities and the specialized municipalities (where the averages are influenced by the largely urban centres in Strathcona County and Wood Buffalo). Transportation (road) costs are especially large for the municipal districts where they average 48 per cent of total expenses. Transportation costs are also relatively large (31 per cent of the total) in the two large cities. There, however, public transit amounts to one-half of transportation expenses. On a per capita basis, environmental expenses (primarily water and waste) are comparatively large in the towns and villages. Planning and development are a larger share of costs in the two big cities, the specialized municipalities, and the municipal districts. Recreational and cultural programs are a smaller budget item in the municipal districts where, in many cases, the rural municipality contributes to or shares costs of recreational programs that their citizens enjoy in the neighbouring towns and villages.

The activities of Alberta's municipal governments are dominated by transportation, protection, water and waste, and recreation/culture (totalling about three-quarters of total expenses) and, with general government, comprise about 90 per cent of expenses. Municipal services almost exclusively benefit municipal residents. Exceptions having some spillover benefits include policing, some transportation and recreation, and some housing. The services are typically linked to property. Social programs that have large spillovers and/or involve redistribution (e.g., education, health and social assistance) are minimal. This allocation of responsibilities is widely recommended for municipal governments (e.g., McMillan, 2008). Differences in municipal characteristics cause the magnitudes of the various functions to differ among the types, and sometimes even among individual municipalities. Those differences must be recognized in designing municipal policy.

3. MUNICIPAL GOVERNMENT REVENUES

Alberta's municipal governments obtain revenue primarily from three sources – taxes, sales of goods and services, and grants/transfers from other governments. Statistics Canada reports that in 2019 Alberta municipalities realized 59.4 per cent of revenues from taxes (47.7 per cent from property taxes and 11.6 per cent from other taxes), 19.5 per cent from sales, 17.1 per cent from transfers and four per cent from other sources (e.g., property income, fines, etc.).⁹ Since 2008, the share of revenues from taxes has increased somewhat and that from transfers has diminished. The distribution across revenue sources in Alberta is reasonably similar to the average across the nine other provinces for which taxes generated 52.3 per cent, sales and other revenues 26.5 per cent, and transfers 21.2 per cent. There are, however, some notable variations across the provinces. For example, in British Columbia, transfers contributed only nine per cent but sales and other revenues financed 36 per cent of the total. On the other hand, taxes were the lowest share in Prince Edward Island at about one-third while they were

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Calculations are based on data from Statistics Canada Table 10-10-0020-01.

the largest revenue source in Quebec at 62 per cent. Finally, while this will be examined further below, per capita municipal revenues are the highest in Alberta at \$4047 which compares to the nine province average of \$2363. The range is wide, from \$1113 in PEI to \$3586 in Ontario. Also, municipal property taxes per person are the highest in Alberta at \$2403, with Ontario next at \$1885.¹⁰

Alberta Municipal Affairs data provides much more information on municipal revenues in Alberta. Taxes are the major revenues source at 44 per cent (43.4 per cent property taxes and 0.6 per cent other taxes) with sales at 20.4 per cent and transfers at 21.4 per cent being the other main sources. Income from various other sources—property income (5.9 per cent), permits/concessions (4.5 per cent), fines (1.8 per cent) and other (2.0 per cent) comprise the remaining 14.2 per cent. Total revenue per capita in 2019 was \$4143 per person.¹¹ Transfers from senior governments provide 15 per cent of revenues (the remainder coming mostly as contributions from developers). Transfers from the provincial government account for four-fifths of the transfers from governments. Those transfers are primarily (over 70 per cent) conditional and support municipal capital projects. Approximately one-half (52.6 per cent) of sales and charges come from water and waste fees. The other main contributors to that revenue source are transportation charges (17 per cent), gas and electricity levies (11.3 per cent), and recreation/cultural fees (8.3 per cent). Property taxes are levied on two broad classes of property: residential/farm and non-residential. In 2019, residential/farm property taxes produced 42.6 per cent of municipal property tax revenue and non-residential property 57.4 per cent. Those amount to \$767 and \$1033 per capita respectively. Property owners also pay Education Property Tax averaging \$374 per person for residential/farm and \$214 per person non-residential (for a total municipal and provincial property tax cost of \$2388).^{12,13}

Alberta has an exceptionally large non-residential property tax base as a result of the province's industrial structure. In 2016, Alberta's non-governmental, non-residential net capital stock per person was 3.15 times the average of that in the five other provinces from Quebec to British Columbia and 5.3 times the level in Ontario and Quebec (McMillan, 2019). Looking at equalized assessment values in 2019, residential and farm assessments amounted to 64.7 per cent of the total in the province and non-residential 35.3 per cent. Despite being about a third of assessments, non-residential property (which is typically more heavily taxed by municipalities everywhere) generated the majority (57.3 per cent) of the taxes. That large non-residential base affords a property tax advantage for Alberta residential property taxpayers, but as this is closely related to the oil and gas industry it is distributed rather unevenly among municipalities.

¹⁰ For additional information on municipal finance in the Canadian provinces see McMillan (2006) and Slack et al. (2007).

¹¹ Although the per capita total revenue reported is quite close to that from the Statistics Canada sources, the allocations (notably for other taxes) are quite different.

¹² The Education Property Tax is to support schooling. Currently it amounts to about 30 per cent of operating costs.

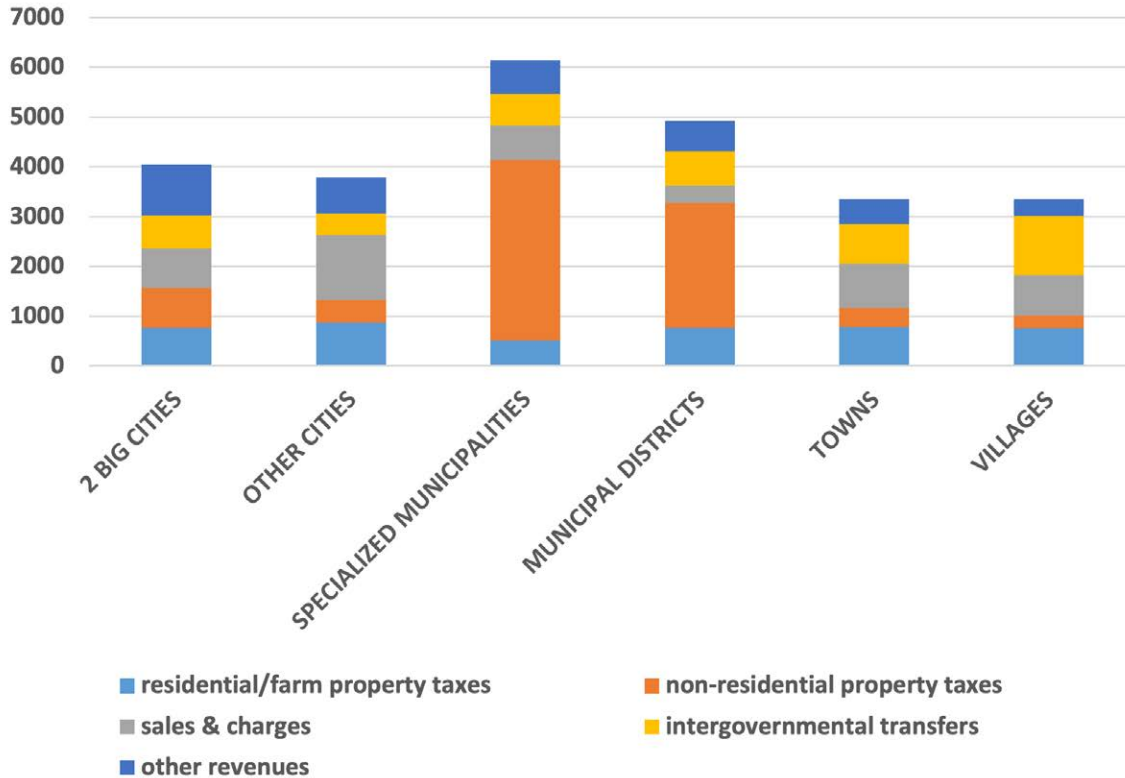
¹³ Municipal residential/farm property taxes amount to 1.27 per cent of household income and the total municipal tax bill to 2.98 per cent. As a percentage of GDP, total municipal taxes are 2.22 per cent.

Differences in the revenue sources among municipalities are considerable. Figure 2 shows the main revenue sources by municipal type in dollars per capita. Residential/farm property taxes make a modest contribution to municipal revenues in all classes of municipalities — in none more than one-quarter of the total. On a per capita basis, those taxes are lowest in the specialized municipalities (\$513 on average) and highest in the other cities (\$875). The greatest difference among the municipal types is in the non-residential property tax revenue. Per capita non-residential property taxes are largest in the specialized municipalities (\$3625) and the municipal districts (\$2500) and result in those two types of municipalities having the largest per capita revenues.¹⁴ Non-residential property is composed essentially of land and improvements, machinery and equipment, and linear property (notably, oil and gas wells and pipelines). There are very large differences in the per capita tax revenues from those properties across the municipalities in the two municipal classes that are thought to make large differences in the financial wellbeing of municipalities (see Conger and Dahlby, 2015). Sales and charges generate the greatest per capita revenue (\$1297) in the other cities and are lowest (\$346) in the municipal districts. These revenues result primarily from charges for water and waste services and for municipal gas and electricity services (which explains the low revenues in the rural municipalities). Fees for these services exceed the functional expenses of those services in the other cities. Intergovernmental transfers are, on a per capita basis, largest to the villages (\$1294) and smallest to the other cities (\$436). Otherwise, they ranged between \$622 and \$794. Provincial government grants amount to about three-quarters or more of total grants to each municipal type. Also, these grants are predominately, and especially those to the cities, designated for capital purchases. Capital grants to the cities are directed mostly (about three-quarters) to transportation while those to other classes of municipalities are primarily split between transportation and water/waste services. Ranging between one-quarter and one-third of new capital purchases for most types of municipalities (and over half for villages and summer villages), capital transfers make an important contribution to capital acquisition for transportation, water/waste, and recreation/culture. Various other revenue sources are most significant to the two large cities where they average \$1021 per person.

¹⁴

Residential/farm equalized assessments are only 32 per cent of the total in the specialized municipalities and 42.8 per cent in the municipal districts. (Farmland is assessed at a “productive” value which is much below market value.) Residential/farm property represents three-quarters of the total assessments in cities and towns and 83 per cent in the villages.

Figure 2. Major Revenue Sources, 2019 (\$ per capita)



Municipal revenues in Alberta are quite well matched to municipal responsibilities. While there may be some further opportunities to levy user fees,¹⁵ sales and charges are used extensively, especially to fund utility services. Transfers are mostly provincial contributions toward the capital costs associated with transportation, environmental, and recreational/cultural services. Those, particularly in the case of transportation, may involve spillovers to non-residents or involve other provincial priorities.¹⁶ Other areas — notably social services/homelessness/social housing — though small in municipal budgets, may require further provincial support since, while municipalities may be effective managers of those programs, they are not well suited as a municipal responsibility. Also, spillovers from local policing in large municipalities potentially call for additional provincial funding.

Though often criticized, the property tax is a good tax for municipal governments with responsibilities as found in Canada (e.g., see Youngman, 2016).¹⁷ While some have argued for expanding municipal government tax powers (especially for cities: e.g., see Kitchen, 2019; and Vander Ploeg, 2008), we have argued elsewhere that other taxes are not required and that the property tax is adequate, responsive and fair (Dahlby and

¹⁵ Opportunities relate especially to the use and financing of infrastructure (e.g., Bird and Slack, 2017) and road and street usage, as charging for that has become feasible (e.g., Lindsay, 2019).

¹⁶ Even so, the capital-operating balance might benefit from reconsideration.

¹⁷ For a broad discussion of the matching of local government finances with responsibilities see Kitchen, McMillan and Shah (2019) and McMillan (2008).

McMillan, 2014 and 2019). Should additional tax room be desirable, that could best be accomplished by reducing (even eliminating) the provincial Education Property Tax as it relates poorly to the benefits that arise from funding education generally.¹⁸ Although it has received much attention, the residential property tax accounts for less than one-quarter of municipal revenues in Alberta municipalities. The disproportionate share of municipal property taxes coming from non-residential property (relative to its share of the property tax base) has been a source of some criticism. Rebalancing may deserve further consideration, but it may be an area in which politics overwhelms economics. Some prominent property tax issues are addressed further below.

4. ASSETS AND DEBT

Municipal governments hold considerable assets and typically have some liabilities. For Alberta municipalities in 2019, 89 per cent of net assets are non-financial (i.e., capital assets) and 11 per cent are net financial assets. Total liabilities, the bulk of which is long-term debt (reflecting the fact that municipalities can only borrow long term for capital expenditures) amounts to approximately one-quarter of net assets. Net assets average approximately \$17,000 per person for cities, towns and villages, \$25,000 for municipal districts and \$34,000 for the specialized municipalities. Part of the assets that municipalities hold are restricted in that they are designated to help fund future outlays, outlays mostly for new capital. In 2019, restricted surpluses averaged over \$3900 per person over all municipalities and the municipalities contributed \$614 per person to restricted surplus accounts.

Total debt, on average, is comparatively modest. On a per capita basis it amounts to about \$2600 for cities, \$1300 for towns, \$800 for specialized municipalities, \$925 for municipal districts, and \$785 for villages. The province establishes debt limits and debt service limits that municipalities must adhere to. Overall, Alberta municipalities are at 40 per cent of their debt limit and 26 per cent of their debt service limit and are therefore well below the maximums. The cities as a group are a little above the provincial average for both limits and the other types of municipalities are well below the average.¹⁹ As with other factors, there is substantial variation among individual municipalities here as well. Excluding the cities, all classes have municipalities without debt but also, and notably among the towns and villages, there are a few municipalities that are testing the limits. Among the cities, the minimum levels are at 14 per cent and the maximum is almost 60 per cent of the debt limit and 75 per cent of the debt service limit.

Overall, in our assessment Alberta municipalities are in a good financial position. Net financial assets are comfortably positive and non-financial assets are substantial. Also, the levels of debt and debt servicing costs are well below the provincially set limits.

¹⁸ The provincial education property tax is a relic of an era when income and general sales taxes did not exist or were not substantial revenue sources.

¹⁹ Towns are a partial exception in that their average level of debt service is approximately at the provincial average for all municipalities.

5. TWO CHALLENGING PROPERTY TAX ISSUES

A commonly held view by commentators and municipal politicians is that municipalities, and especially the large cities, need a wider range of revenues sources because the property tax is no longer adequate to finance municipal services and infrastructure. Another common refrain is that the property tax has serious shortcomings—that it is “inelastic” or unresponsive to economic growth, highly regressive, and impedes economic growth and development. In McMillan and Dahlby (2014), we argued that the alleged inadequacies of the property tax have been overstated. Moreover, the other major sources of tax revenue that could conceivably reduce municipalities’ dependence on the property tax revenues, a local income tax and a local sales tax, have significant shortcomings and in our view are not suitable substitutes for the property tax. Replacing the property tax by a local income tax would require that a large surtax, on the order of 50 per cent, would have to be applied to the provincial income tax. We do not think that a personal income tax increase of that magnitude would be fiscally sound or politically acceptable. A local sales tax that piggybacked on the federal GST would be a low-cost way of implementing a sales tax, but the federal government has ruled out collecting the GST/HST at the local level. A local retail sales tax, as levied by some U.S. cities, would be administratively expensive. It would inevitably be applied to some business inputs, raising business competitiveness concerns. Tax rate differences across municipalities would create incentives for inefficient cross-border shopping. Perhaps most importantly, the income and sales tax fields are already co-occupied by the federal and provincial governments. Allowing another level of government to levy these taxes would reduce transparency and accountability and increase tax base interactions that distort fiscal policy decisions. Our overall conclusion remains the same—the property tax, with all its limitations, should remain the main source of tax revenue for municipalities in Alberta.

The focus should instead be on reforming or adapting the property tax to finance municipalities in Alberta during a period of fiscal restraint and, most likely, slower economic growth. We begin by considering the trend in the residential property tax burden in Alberta because these are the taxes that are of most concern to homeowners. Recent developments have focused attention on the mix between residential and non-residential property taxes. Rebalancing the mix has emerged as an important and challenging policy issue.

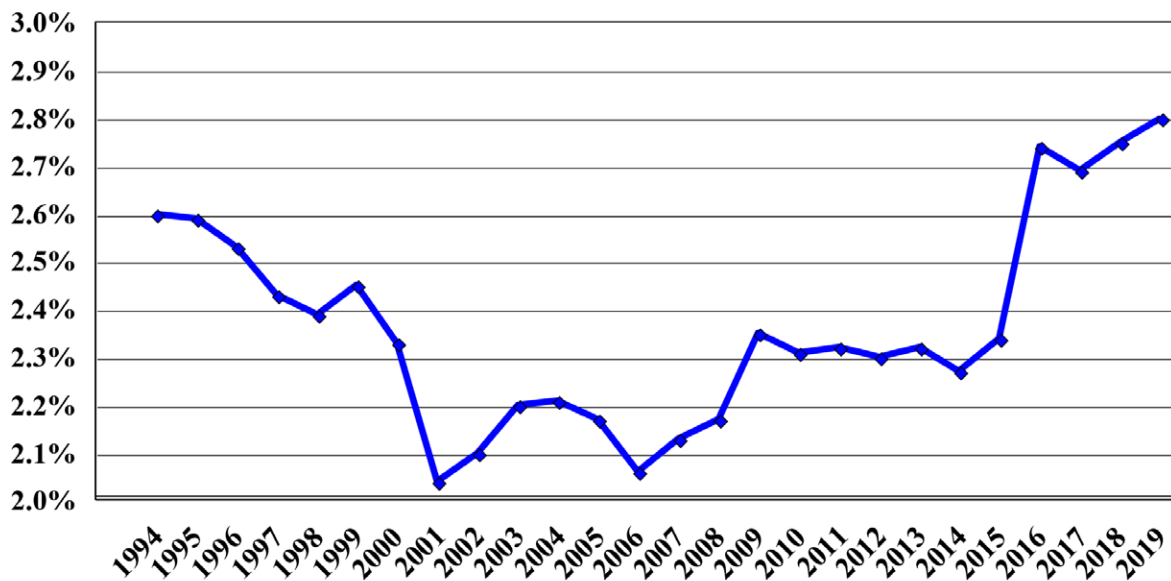
5.1 THE BALANCE BETWEEN RESIDENTIAL AND NON-RESIDENTIAL PROPERTY TAXES

Figure 3 shows that residential property taxes in Alberta were 2.8 per cent of total disposable household income in 2019. This is the highest percentage in the last 25 years.²⁰ This sharp increase has occurred because disposable household income declined by 2.2 per cent between 2015 and 2019, while residential property taxes increased by 17.4 per cent.

²⁰

Although not strictly comparable with these figures, data in McMillan and Dahlby (2014, Figure 1, 3) indicate that property taxes were a higher percentage of personal income in the 1960s than in the last 25 years.

Figure 3 Residential Property Taxes as a Percentage of Disposable Household Income in Alberta



Source: Statistics Canada Table 36-10-0224-10 and Alberta Municipal Financial and Statistical Data

While residential property taxes are very salient for voters, non-residential property taxes have been the larger share of total property tax revenues for most of the last 25 years. As Figure 4 indicates, non-residential property taxes exceeded 50 per cent of total property taxes in Alberta except from 1998 to 2006. As recently as 2015, non-residential property taxes accounted for almost 55 per cent of total property tax revenues. However, since 2015 the share has come down to 53 per cent.

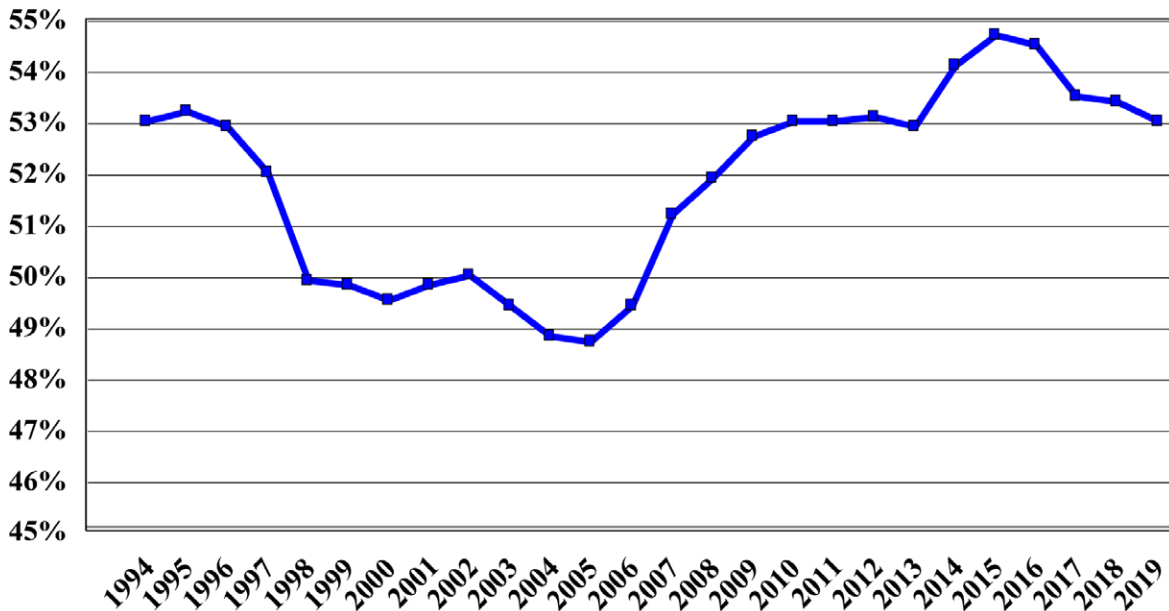
The importance of non-residential property taxation in evaluating the overall competitiveness of the business tax system has been highlighted in a series of studies by the C.D. Howe Institute of the marginal effective tax rates on investment (METR) in 10 major cities in Canada.²¹ In their most recent study, Found and Tomlinson (2020, 4) reported that the METR in Calgary in 2019 was the third lowest, after Montreal and Saskatoon, at 38.4 per cent. The provincial non-residential property tax contributed 4.6 percentage points and Calgary’s non-residential property tax contributed 19.2 percentage points to the total METR. In other words, the non-residential property taxes accounted for more than 50 per cent of the total tax wedge.

Whether Alberta’s municipalities can continue to rely or should rely on non-residential property taxes to fund municipal services, along with these being an important source of provincial government revenues, will be key questions during the period of fiscal restraint and slower economic growth that we are now entering. In particular, shifting the property tax burden from non-residential property to residential property will no

²¹ The METR is a measure of the tax wedge between the pre-tax rate of return and the after-tax rate of return on a marginal investment. See McKenzie (2016) on the theory and measurement of METR.

doubt be politically challenging given the decline in household incomes since 2015, the reduction in employment during the pandemic, and lower projected rates of future income growth.

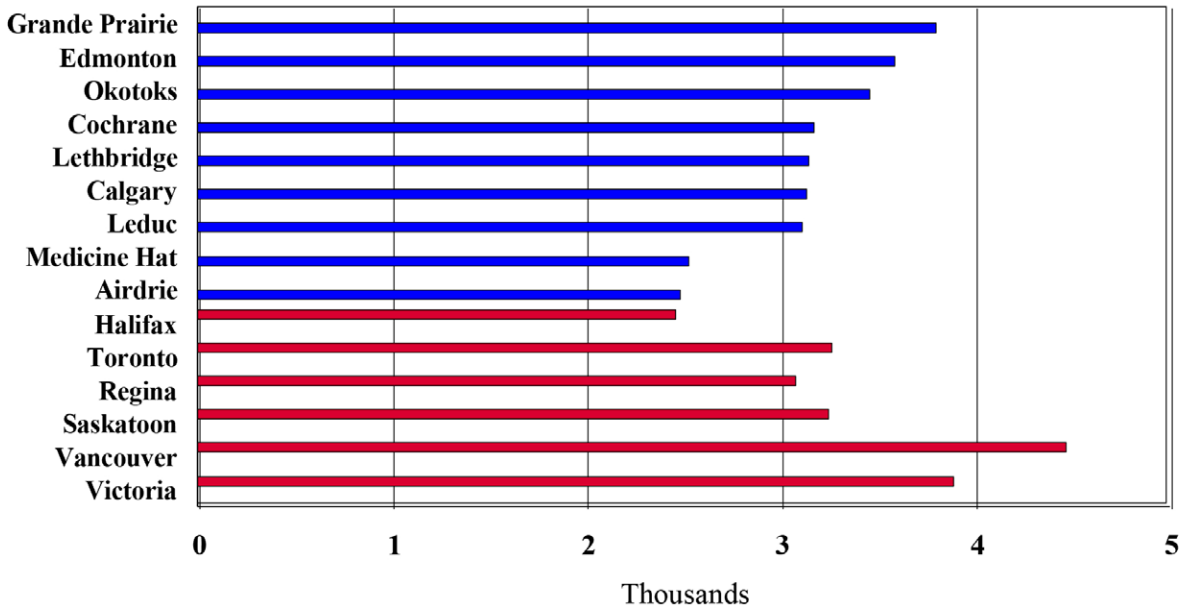
Figure 4 Non-Residential Property Taxes as a Percentage of Total Property Taxes



Source: Alberta Municipal Financial and Statistical Data

As noted earlier, 68 per cent of Alberta’s population lived in its 19 cities in 2019. Although all municipalities face broadly similar property taxation issues, it is useful to focus first on the taxation issues in the cities where most Albertans live. While we will deal with the finances of the 19 cities in Alberta as a group, the level and composition of the property tax varies considerable among them. Consequently, it is useful to consider separately the property tax issues in the two largest cities, Calgary and Edmonton where 52 per cent of Albertans live. Figure 5 shows that property taxes on a representative single detached house vary substantially across Alberta cities, with \$3,828 in Grande Prairie and \$2,508 in Airdrie, which makes it difficult to generalize about the burden on residential property taxes across cities. These data indicate that property taxes on a representative single detached home are lower in Calgary than in Edmonton, are comparable to that levied in Toronto, Regina, and Saskatoon, and lower than in Vancouver and Victoria.

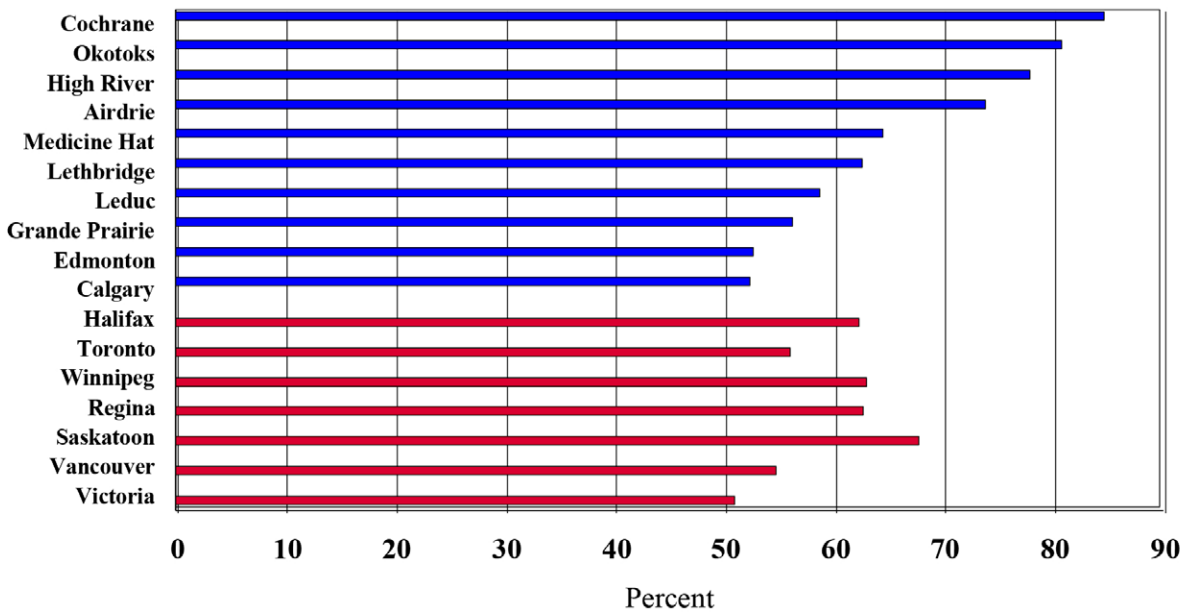
Figure 5 Median Property Tax for Single Detached Houses in 2019 for Selected Cities



Source: City of Calgary (2019).

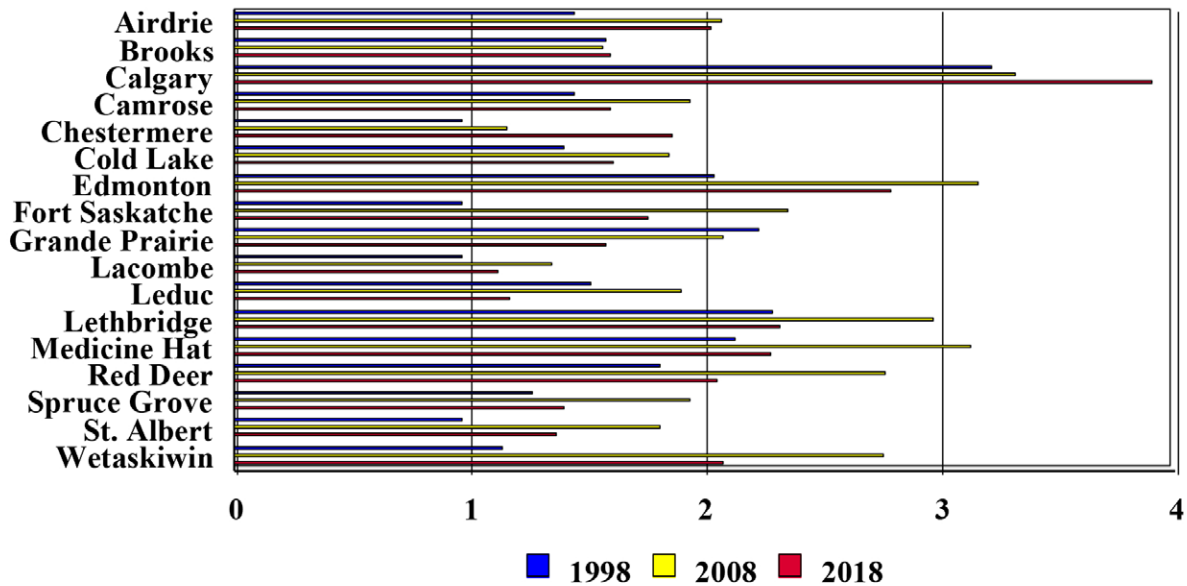
Figure 6 shows that the residential property tax share of total property taxes also varies across cities in Alberta, from 85 per cent in Cochrane to 53 per cent in Edmonton and Calgary. The residential property tax share in Alberta’s two largest cities is lower than in the other Canadian cities except Victoria.

Figure 6 Residential Property Share of Total Tax Levy in 2019 for Selected Cities



Source: City of Calgary (2019)

Figure 7 Ratio of Non-Residential to Residential Property Tax Rates, 1998, 2008, and 2018



Source: Alberta Municipal Financial and Statistical Data

Most municipalities levy a higher mill rate on non-residential property than on residential property. Figure 7 shows the ratio of the non-residential mill rate to residential mill rate in the 17 cities. Between 1998 and 2008, most cities increased their non-residential mill rates relative to their residential rates, with the average ratio increasing from 1.61 to 2.27. Between 2008 and 2018, 14 municipalities reduced their ratios. Only Brooks, Calgary, and Chestermere bucked this trend by increasing non-residential mill rates faster than residential rates. The ratio of non-residential to residential mill rates is the highest in Alberta's two largest cities, with a ratio of 4.22 in Calgary and 2.75 in Edmonton in 2019.

A study by Dahlby, Ferede and Khanal (2021) indicates that a higher non-residential property tax rate discourages business investment in building construction. They found that the elasticity of business investment with respect to the effective non-residential property tax rate is about -0.69. Measured at the sample mean effective tax rate and investment rates, this means that a one mill increase in the effective tax rate is associated with a \$39.37 decline in the annual real per capita building construction. A lower stock of capital means that property and income tax bases will be adversely affected in the future, and revenue from these sources will be lower than it otherwise would be.

The adverse economic effects of a property tax increase can be measured by the Marginal Cost of Public Funds (MCF), which is the loss incurred by a society in raising an additional dollar of tax revenue. (See Dahlby (2008) on the theoretical foundations of the MCF, and Dahlby and Ferede (2018) for computations of the MCFs for the three main taxes levied by Canadian provincial governments.) The efficiency loss from a tax rate increase is directly related to how tax bases are affected. To the extent that

tax bases shrink because of tax avoidance, the MCF will be higher. In the case of the property tax, the reduction in the present value of future tax revenues is the key behavioural response that determines its MCF.

Calculations indicate that from the City of Calgary's perspective, the MCF is 1.33. This is relatively low compared to the Dahlby and Ferede estimates of the MCFs for the personal income tax or the corporate income tax in Alberta. One reason why the MCF for the non-residential property tax is relatively low, in spite of the negative impact it has on investment in buildings and structures, is that land accounts for a substantial share of the non-residential property tax base. Since the supply of land is very inelastic, the MCF from the tax on land is close to 1.0. The overall MCF is a weighted average of the tax on land and the tax on investment in building and structures, which is why the overall MCF is relatively low.

The MCF for the City of Calgary only takes into account the impact on the city's non-residential property tax revenues. The decline of property income from the lower capital stock also negatively affects federal and provincial income tax revenues. Incorporating this so-called vertical fiscal externality in the calculation increases the MCF to 1.70. The property tax's comparatively low MCF is an argument in favour of continuing the reliance of municipal government on it.

Calgary's fiscal challenges are particularly acute. Following the steep decline in oil prices in 2014, there were many layoffs by the oil and gas firms and related industries in Calgary. The reduced demand for office space, combined with the increase in premium office space that had been under construction prior to the downturn, has pushed the vacancy rate in the downtown office buildings to around 30 per cent. The decline in the value of the downtown buildings resulted in a \$250 million cumulative reduction in revenues from these properties over the period 2016 to 2019. (City of Calgary 2020, 15-16) The City of Calgary's response was to increase non-residential property tax rates to maintain the share of total property tax revenues that it derived from the non-residential tax base. The increase in the non-residential mill rate led to major increases in the property taxes levied on non-residential property outside the downtown core. To soften the impact of this shift in the tax burden, the City implemented a series of "one time" tax relief measures to keep property tax increases below 10 per cent in 2018, 2019, and 2020. These measures were funded out of the City's "rainy day" fund. Clearly these measures are not sustainable. The City has tried to come to terms with the reality of lower downtown building assessments in 2019 by increasing residential property's share of total property taxes from 48 per cent to 52 per cent.

While this move to rebalance the property tax burden from non-residential to residential property is welcomed, it is not likely to resolve the City's financial problem. Property tax rates on non-residential property remain high and the temporary relief measures cannot be sustained indefinitely. In our view, residential property owners will have to bear a larger share of the total tax burden in Calgary in the future. The long-term goal should be to better align the shares of the residential and non-residential property burden with their shares of the costs of providing them with municipal services. This is consistent with the so-called benefit view of municipal taxation which dominates much of the policy discussion.

A few studies have compared the benefits from municipal services to residential and non-residential property. Mintz and Roberts (2006) estimated that in Alberta non-residential property received about 35 per cent of the municipal services while contributing 47 per cent of property tax revenues. A study by MKK Consulting (2007) for the City of Vancouver attributed 24 per cent of municipal services to non-residential property while contributing 55 per cent of property-based taxes. Further studies of the benefits from municipal services to residential and non-residential property are warranted, but the existing studies indicate that a substantial shift in the property tax burden from non-residential to residential property would be required to bring their shares of the property tax burden in line with their benefits from municipal services.

5.2 TAXATION OF OIL AND GAS INDUSTRY PROPERTY BY RURAL MUNICIPALS

Non-residential property taxes are an even larger share of the property tax burden in Alberta's rural municipalities than in the cities. In 2019, non-residential property taxes were 78 per cent of total property taxes in municipal districts and the specialized municipalities. In particular, the taxes levied on machinery and equipment and linear property represented 58 per cent of property tax revenues and have become a highly contentious issue.

The municipal districts as a group receive substantial revenues largely from the taxation of oil and gas properties and pipelines, although it should be noted that there are substantial differences among the municipal districts in the amount of revenues that they raise from these sources. (See Conger and Dahlby 2015.) The oil and gas industry, especially since the downturn in world oil prices in 2014, has complained about the heavy municipal tax burden. It has become second only to royalties among the payments that the industry makes to governments. The industry has argued that property taxes by Alberta's municipalities are higher than in Saskatchewan and Manitoba, putting Alberta projects at a competitive disadvantage compared to investment in those provinces. The Rural Municipalities of Alberta (RMA) has countered that any reduction in the taxes collected from oil and gas properties will mean higher residential property taxes on rural residents and reduced expenditures on roads and bridges, a key component of Alberta's transportation infrastructure (RMA 2020).

Some oil and gas firms have stopped paying their property taxes altogether. The RMA has estimated that in 2021 approximately \$245 million in property taxes by oil and gas companies have gone unpaid, up from \$173 million in 2020, and \$81 million in 2019 (RMA (2021)). The rural municipalities complain that they are unable to collect these unpaid taxes because provincial legislation does not permit them to place liens on linear property and well sites.

In response to these pressures, Alberta Municipal Affairs launched a review of the assessment of oil and gas properties in early 2020. In October, the Government of Alberta announced some interim measures to provide the oil and gas industry with some tax relief, including elimination of the Well Drilling Equipment Tax, a three-year exemption from property taxes for new wells and pipelines, and lower assessments for less productive oil and gas wells. These measures are expected to reduce municipal and education property revenues by \$80 million in 2021. It also announced that it

would continue to review the regulated assessment system for oil and gas properties over the next three years.

To assess the impact of property taxes on investment incentives in the oil and gas industry, we have calculated the marginal effective tax rate (METR) on capital.²² The METR is a measure of the wedge that the tax and royalty system drives between the pre-tax rate of return that a marginal investment has to earn in order to generate the net-of-tax rate of return that investors need in order to justify the investment. This wedge is expressed as a percentage of the pre-tax rate of return.²³ Previous studies of the METR on oil and gas projects did not include the property taxes that are levied on machinery and equipment and linear property by provincial and municipal governments. To incorporate property taxes in the METR, we use the municipal and provincial mill rates in 2019 as well as an estimate of the present value of the assessment on an additional dollar of investment in a project.

Table 1 shows the key fiscal parameters that are used to calculate the METR on an investment in an oil well in Alberta, British Columbia, and Saskatchewan. The combined federal and provincial corporate income tax rates are for 2020 and include the reduction in Alberta's statutory rate to 8 per cent. The estimates of the effective real sales tax rates on the inputs used by the oil and gas industry in British Columbia and Saskatchewan are based on the data in Crisan and Mintz (2016). For Alberta, we include an estimate of the effective Well Drill Equipment Tax rate. The effective royalty rates on oil are also based on Crisan and Mintz (2016) and are based on WTI of \$50 and operating costs of \$10 per barrel. The property tax rate on an oil well for Alberta is the weighted average of the rural municipal and provincial non-residential mill rates in 2019, where the weights are the municipalities' shares of equalized linear property assessment. The mill rates for British Columbia and Saskatchewan are the estimated average mill rates in these provinces in the Altus Group (2015) report. The present value of the assessment on one dollar of investment in an oil well in Alberta is based on the assumption that the assessed value is 23 per cent of the actual expenditure on the well. For British Columbia and Saskatchewan, the present value of the assessment on a dollar of investment is based on the assessment data in the Altus Group (2015) report.

The last column in Table 1 shows that in Alberta the METR on an investment in an oil well is 31.8 per cent, a bit higher than in British Columbia at 28.9 per cent, and approximately the same as in Saskatchewan at 32.5 per cent. Our analysis indicates that the elimination of the Well Drilling Equipment Tax and the three year exemption from property taxes on a new oil well would only reduce the METR to 0.309.

To summarize, the computation of the METR for an oil well in the three western provinces, which includes estimates of the effective property tax rates, indicates that the marginal tax burdens are similar, with the property tax in Alberta representing only about 10 per cent of the overall tax wedge. While this analysis suggests that high

²²

Another issue, not dealt with here, is whether the property tax burden can lead to the pre-mature shutting in of low productivity oil and gas wells.

²³

Chen and Mintz (2012) provide a detailed description of the marginal effective tax rate model for the oil and gas industry.

property tax rates are not a significant deterrent to oil and gas well drilling investment, it must be emphasized that these results are largely driven by the assumption that the regulated assessment is only 23 per cent of the actual cost of the well. The regulated assessment system is complex and, in many aspects, arbitrary. Accordingly, these results must be regarded as preliminary. Further analysis of the property assessment system for the oil and gas industry, including a review of the taxes levied on machinery and equipment, is clearly warranted.

Table 1 Key Fiscal Parameters in Calculating the METR for Investment in an Oil Well

Province	Corporate Income Tax Rate	Effective Provincial Sales Tax Rate	Effective Royalty Rate	Property Tax Rate on Oil Well Assessment	Present Value of Assessment on a Dollar of Investment	METR
AB	0.23	0.0043 ^a	0.278	0.014	2.896	0.318
BC	0.27	0.0150	0.252	0.020	0.970	0.289
SK	0.27	0.0019	0.272	0.025	2.429	0.325

^a Estimate of the effective Well Drilling Equipment Tax rate.

6. SUMMARY AND CONCLUSION

Alberta municipal governments provide goods and services vital to the liveability and commercial success of their communities. These services almost exclusively benefit municipal residents and are typically linked to property. The exceptions are those that have some spillover benefits, for example policing, some transportation and recreation, and some housing. Municipalities have limited responsibility for social programs that have large spillovers and/or involve redistribution. Overall, the municipalities' responsibilities are consistent with the provision of goods and services that benefit residents. Hence, Alberta municipalities are doing what they should and, while arguably there are some potential refinements, there is no fundamental mismatch in the municipal-provincial responsibility assignment.

Property taxes constitute close to 50 per cent of municipal revenues, with sales and user charges and government transfers the other major sources of revenue. This arrangement too is very much consistent with the recommendations of the fiscal federalism literature. In the current circumstances of provincial austerity (e.g., as reflected in reduced transfers, less support for disaster relief, and rural municipalities expected to contribute to policing costs), some might argue for expanded municipal tax sources. Although the property tax has its limitations, we argue against expansion of municipal tax bases (e.g., land transfer taxes, local sales tax) and think that the property tax should remain the main source of tax revenue for Alberta municipalities.

The disproportionate share of municipal property taxes coming from non-residential property and the relatively high mill rates on non-residential properties has been a concern of the business community, especially in Calgary. Although residential/farm property taxes generate less than one-quarter of municipal revenues, rebalancing the property tax burden to bring it more in line with the costs of providing services to the

two types of property is a difficult political challenge at the best of times and especially now, given the decline in household incomes in Alberta and the reduced prospects for economic growth. Nonetheless, we think that this is the direction that policy makers must go. Should such a move suggest that additional tax room is required, we would suggest that the province abandon (especially the residential/farm) school property tax leaving the property tax as a strictly municipal tax.^{24, 25}

The property taxes levied on oil and gas properties by rural municipalities, although long an irritant to the industry, have become a major conflict between Alberta's economic engine and the municipalities that provide key infrastructure and community services that have enabled the industry to thrive. Although property taxes appear to be a small contributor to the industry's tax wedge, the regulated assessment system for oil and gas properties is complex and needs an on-going review to balance the revenue needs of the rural municipalities with the oil industry's competitiveness concerns.

We have only touched on these two challenging fiscal issues in this chapter. The municipalities' face other fiscal challenges —the uneven distribution of non-residential property tax revenues across municipalities, the level of the provincial Education Property Tax, the regulation of the differential tax rates between residential and non-residential property, the assessment of agricultural property, the sharing of municipal services and tax on a regional basis, and the level and allocation of provincial transfers. More in-depth policy analysis is clearly required.

²⁴ Following introduction of the present Education Property Tax in 1994-95, its contribution to school operating costs steadily declined from 51 per cent to 30 per cent in 2006-07 where it has remained. Provincial education property tax revenues were essentially constant at about \$1.2 billion from 1994-95 to 2004-05.

²⁵ Should the provincial government consider the lost education property tax revenues (about \$2.5 billion in total or \$1.5 billion if residential only) beyond its capacity to absorb in other ways, we would recommend offsetting from general sales tax revenues – a general sales tax also being a tax with a low marginal social cost of funds. From the municipal perspective, further opportunities for user fee revenue might substitute for property taxes to some degree.

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CHAPTER 14

ALBERTA'S PUBLIC DEBT: ENTERING THE THIRD CRISIS*

Robert Ascah

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1.0 INTRODUCTION

Many questions arise about the fiscal impact of COVID-19 and the depressed state of Alberta's energy-based economy.

- When has government borrowed too much?
- What will rapidly rising debt levels mean for Alberta taxpayers?
- What are the critical debt thresholds for the Province?
- What do borrowing constraints mean in terms of adjustment to the levels of provincial revenue generation and provincial expenditures?
- What role will credit rating agencies play as they evaluate debt thresholds in relation to those in other provinces?
- What do higher debt levels mean for the Alberta Tax Advantage and Alberta's long-term economic growth?
- What role does the federal government play in monitoring provincial deficits and debt levels?

This chapter will address these complex questions in several ways. I start with defining public debt, noting the objectives of debt management. I recount the Alberta government's history with public debt, alternating between periods of debt accumulation and debt decumulation which track commodity prices and production cycles of Alberta's resource-based economy. Slowly creeping into public discourse are the liabilities associated with asset retirement obligations or unfunded environmental liabilities which energy companies are legally responsible for. I quantify the size of these liabilities, which may become the responsibility of the Alberta government, with implications for Alberta's credit rating. I review the role of credit rating agencies, which can have an important impact on institutional investors. I conclude with recommendations to political actors and policymakers and offer general conclusions about the role of public debt.

2.0 PUBLIC DEBT AND DEBT MANAGEMENT

Public debt is an obligation or promise of a governmental body (directly or through an agent) to pay interest when due and repay the debt obligation when it matures. It is largely immaterial to the creditor whether the funds are supplied for war, a pandemic or for electoral gain. State debt is issued without priority,¹ with the principal repayable on its due date whether payable in local or foreign currency. In this study, public debt includes debt or loans *guaranteed* by the Government of Alberta.

Debt servicing costs are a statutory provision under Alberta's *Financial Administration Act*, meaning the Legislative Assembly does not vote annual appropriations for these payments. Debt servicing payments therefore are *primus inter pares*, eliminating legislative debate about these charges unless the *Financial Administration Act* is

¹

In contrast to corporate debt which may have a variety of subordination levels.

amended. Appendix A provides examples of the layers of public debt whose source of repayment depends on a government's revenues which, in turn, depend on the health of the economy and the willingness and ability of voters to pay taxes.

Under section 92(3) of the *Constitution Act*, provincial governments have the authority to raise money “on the sole credit of the province.” This provides extraordinary flexibility to support economic development and community building within their territories. However, unlike the federal government, which has exclusive jurisdiction over banking and currency, provinces cannot constitutionally create their own currencies.² This power accords the federal government power to capture *seigneurage* or the benefit of repaying its debts by issuing more currency. This distinction has important implications in the fiscal relationship between federal and provincial governments, granting the federal government primacy in financial markets.

Debt management is a critical, and under-appreciated, function of modern government. The objectives of debt management include:

1. Orderly issuance and retirement of public debt;
2. Minimizing overall borrowing (interest and issuance) costs;
3. Assuring a broad market to absorb new debt and refinancing issuance;
4. Preventing “bottlenecks” during which there is a coincidence of maturing debt with heavy borrowing requirements; and
5. Minimizing risks of debt servicing through the use of derivatives (Ascah, 1999, 2-3).

3.0 DEBT AND GUARANTEE ISSUANCE, 1908-2020

Alberta's public debt issuance can be understood in terms of (1) the recurring rise in indebtedness, (2) fiscal crises, and (3) debt payback. Growing indebtedness has occurred in three time periods, and full debt repayment has been achieved twice, in the early 1950s and the mid-2000s. The accumulation and payback of debt is closely associated with movements in commodity prices.³ Five measures of indebtedness are used: components of the direct and guaranteed debt; financial assets; net debt; debt as a percentage of provincial income; and debt charges as a percentage of government revenue. Prices of principal resources dominating the Alberta economy during these periods are shown as an economic backdrop for the periodic shocks faced by Alberta's economy.

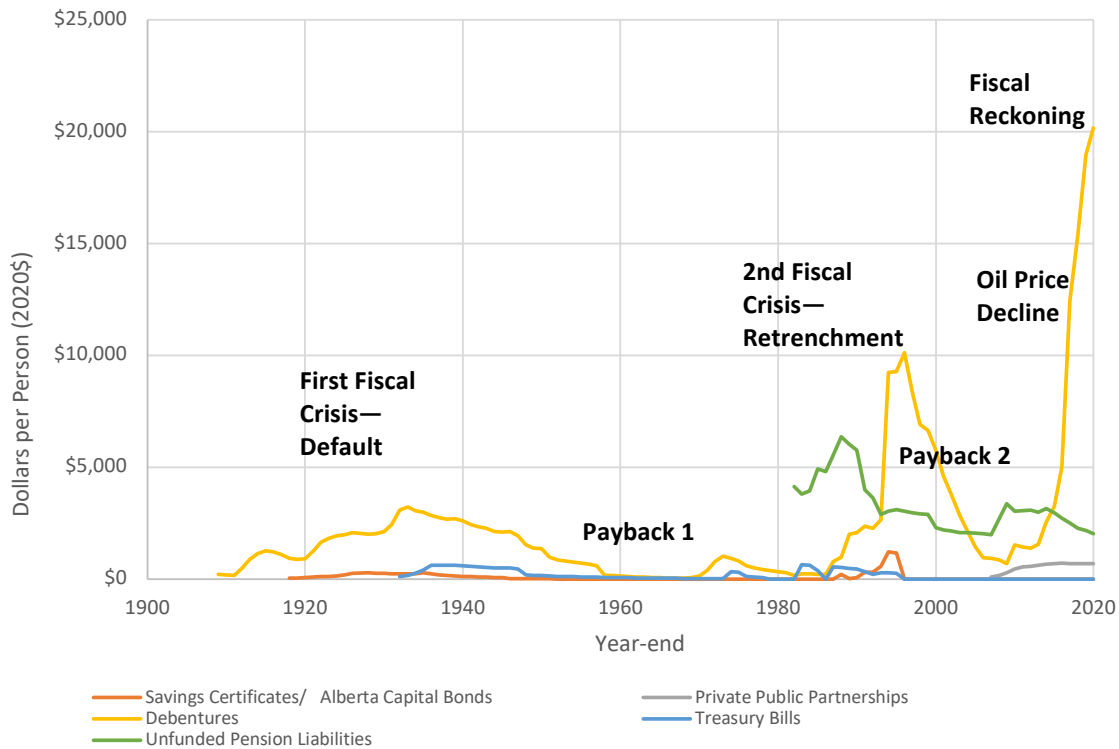
² This did not stop the Social Credit government in 1937 from issuing “Prosperity Certificates” to stimulate purchasing power in the province. These certificates were not accepted at banks and most retailers.

³ Interested readers are referred to Eric J. Hanson's magisterial work *Financial History of Alberta: 1905-1950*, a condensed version of Hanson's massive Brown University Ph.D. dissertation, edited by Paul Boothe and Heather Edwards. The data reflected in the following charts relies on data from Hanson cross checked against the *Public Accounts of Alberta*.

3.1 DIRECT DEBT

During Alberta’s early years, three themes emerge. First, major borrowing supported economic development *viz.* the telephone system, irrigation districts, public works, and railways. Second, borrowing was payable in two or more currencies, reflecting Canada’s immature debt markets. This manner of borrowing created problems as Britain abandoned the gold standard in 1931. And third, indirect or contingent liabilities for railway or irrigation guarantees were major components of the young province’s indebtedness.

Figure 1: Components of Direct Debt, CPI Adjusted, 1908-2020



Sources: *Public Accounts of Alberta, 1908-2020*. Note: Alberta’s fiscal year end was December until 1928 when it changed to March 31. Population: Dominion Bureau of Statistics and Statistics Canada. CPI deflator: Boothe, Table 2.3 and Bank of Canada Inflation Calculator <https://www.bankofcanada.ca/rates/related/inflation-calculator/> Accessed 31 March 2021.

Figure 1 shows Alberta’s per capita debt grew rapidly prior to World War I before access to domestic and international capital markets was shut off by the Dominion government’s war finance efforts (Hanson, 37-42, 65-66). As the post-war recession gave way to a commodity boom and capital markets re-opened, the province borrowed liberally between 1919 to 1925. Per capita debt began to level off as Alberta’s population grew rapidly and was remarkably stable until the effects of the option-pay bonds raised the debt servicing costs while government revenues fell dramatically. Treasury bill borrowing evolved in the early 1930s as the Dominion government sought to assure capital markets that provincial governments had recourse to short-term funding to prevent default. Treasury bills were also used during the 1980s as Alberta’s economy entered recession. In the late 1980s, the province tapped retail savings as Alberta Capital Bonds were marketed through financial institutions. This practice was

discontinued as the costs did not justify the political benefits of a retail debt instrument paying slightly above market rates. During the late 1990s and into the mid-2000s Alberta's debenture debt was slowly retired.

Beginning in the early 1980s, Alberta's *Public Accounts* began to record the unfunded pension fund liabilities, which I am treating as part of Direct Debt. Unfunded pension liabilities relate to public sector pension funds, such as the Local Authorities Pension Plan or the Alberta Teachers Retirement Fund, whose assets were then insufficient to cover pension liabilities when due. The amount of the liability has declined steadily since 1989 as measures to restore proper funding have taken place. The assumption by the government of the pre-1992 liability of teachers' pensions represents about 80 per cent of the total liability. A new part of direct debt is Private-Public Partnerships (P3) which represent the long-term liability of payments to builders and asset managers constructing, operating and maintaining traditional public infrastructure such as ring roads or schools.

3.2 GUARANTEED DEBT

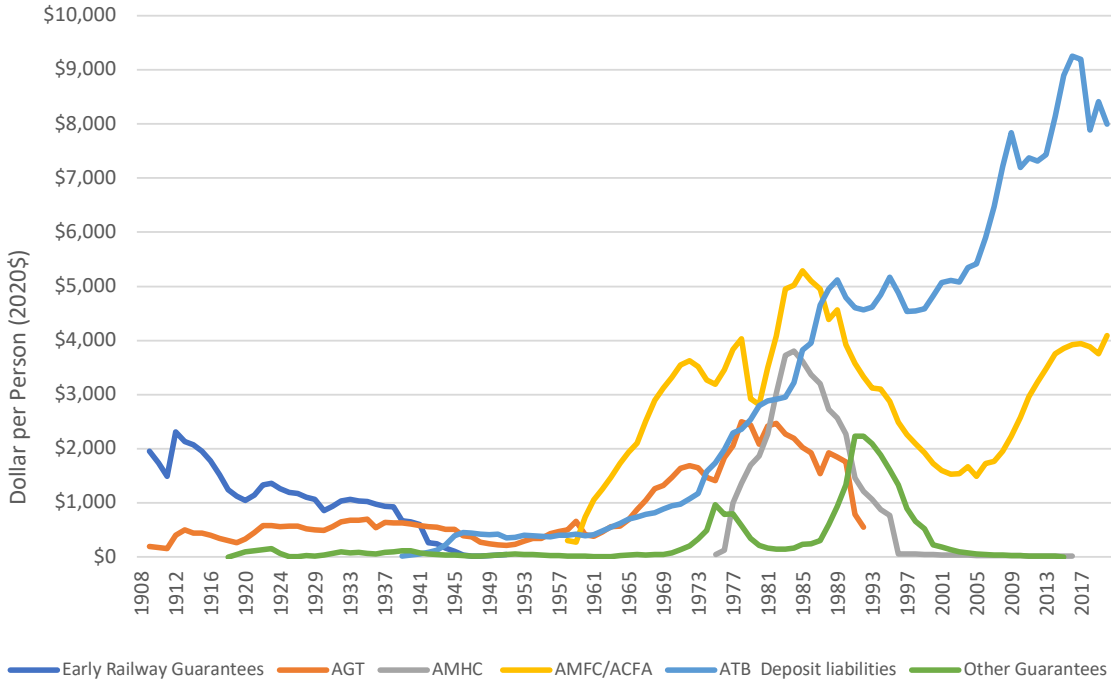
The analytical treatment of guaranteed debenture and bank debt is a challenging topic. Different forms of guaranteed debt rose to prominence in different eras of the province's economic and social development. Figure 2 records debt guaranteed by the provincial government which became unserviceable in the 1930s when grain prices collapsed and direct debtors (irrigation districts, telephones, and railways) could not generate sufficient cash flow to service their debts, compelling the provincial government to step in to service the debt. The 1936 default and subsequent debt reorganization (1946) reflect several factors which are recounted in Hanson (171-187, 360-377) and Ascah (53-80). Chief among the factors was the United Farmers of Alberta (UFA) government's refusal to raise taxes during the boom period (Ascah, 1999, 54-56; Bank of Canada, 8) and Alberta's heavy debt burden compared with that of other western provinces (Hanson, Figure 8.24).

Telephone debt made up a significant portion of the public debt up until 1923 and was soon overtaken by provincial guarantees of railway and irrigation district guaranteed debentures. Of the contingent liabilities identified in the 1924 *Public Accounts*, \$17.1 million was for three small railways, \$6.3 for irrigation districts and \$22.5 million in guarantees for branch lines operated by the restructured Canadian National Railways. (*Public Accounts*, 119; Hanson, 103-108).

During the payback periods (1950s, 2000s) guaranteed debt declined along with direct debt. Starting in the late 1950s a new form of guaranteed provincial debt emerged: municipal debt. As the oil boom brought hundreds of thousands of new residents into Alberta and rural areas began to depopulate, heavy demands were being made on the provincial government from urban politicians. The creation of the Alberta Municipal Financing Corporation in 1958 enabled all municipalities to avail themselves of the Province's under-utilized credit rating. Other guarantees grew during this period, including that of Alberta Government Telephones (AGT) to fulfil business and home requirements. The emergence of social housing in the early 1970s to respond to a massive influx of newcomers led to the creation of the Alberta Housing Corporation in 1975.

The financing of social housing through the Alberta Housing Corporation and the Alberta Mortgage and Housing Corporation (AMHC) became particularly problematic in the 1980s when a real estate crash and very high interest rates proved a financial drain on the finances of the new Getty government. For the Alberta Municipal Financing Corporation (AMFC), now the Alberta Capital Finance Authority (ACFA), there is a degree of circularity in this borrowing arrangement since the provincial government annually advances money to municipal governments for capital and operating purposes. ACFA's current mandate also extends to lending to regional airport authorities which are facing serious cash flow issues due to COVID-19.

Figure 2: Components of Guaranteed Debt, CPI Adjusted, 1908-2020



Sources: *Public Accounts of Alberta, 1908-2020*. Population: Dominion Bureau of Statistics and Statistics Canada. CPI deflator: Boothe, Table 2.3 and Bank of Canada Inflation Calculator <https://www.bankofcanada.ca/rates/related/inflation-calculator/> Accessed 31 March 2021. ATB Financial *Annual Reports*, various years; and *Public Accounts of Alberta*, various years.

As indicated, the Alberta Treasury Branches' (ATB) deposit liabilities, guaranteed by the province, have grown rapidly. While offset by ATB assets in the form of loans to Albertans and Alberta businesses and short term securities, these assets become less secure during severe economic contractions. This is because ATB's profitability and capital reserves erode at a time when the Province's fiscal flexibility is likewise stretched. The capacity of the Province to repay and refinance its debt depends on the health of Alberta's economy which also affects repayment of ATB loans and the adequacy of ATB's loan loss provisions.⁴

⁴ Below I include in calculations of public debt ATB liabilities in developing a range of definitions of net debt.

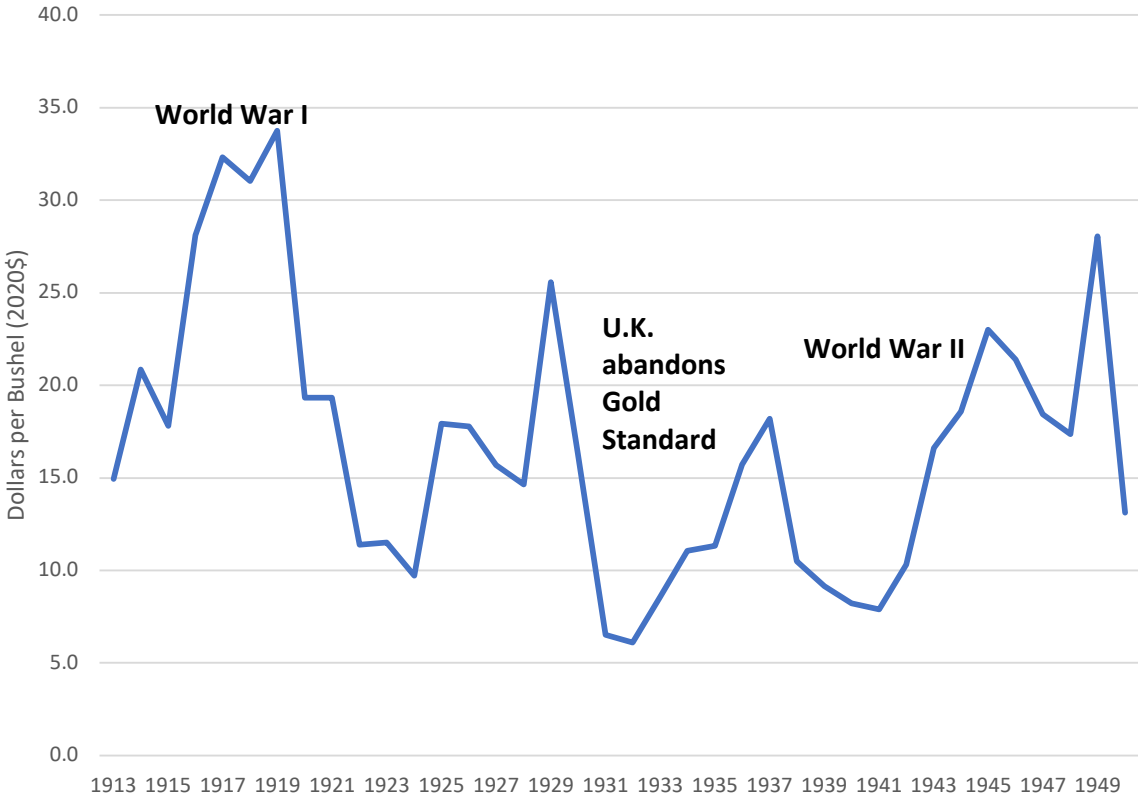
All periods of fiscal crisis arise from what might be termed a “perfect storm” created by the coincidence of economic and fiscal stress forcing the Province to either default for idiosyncratic reasons or seriously restructure its spending and/or revenues.

4.0 ALBERTA’S DEBT CYCLES

4.1 FIRST CYCLE — AGRICULTURE AS ECONOMIC DRIVER

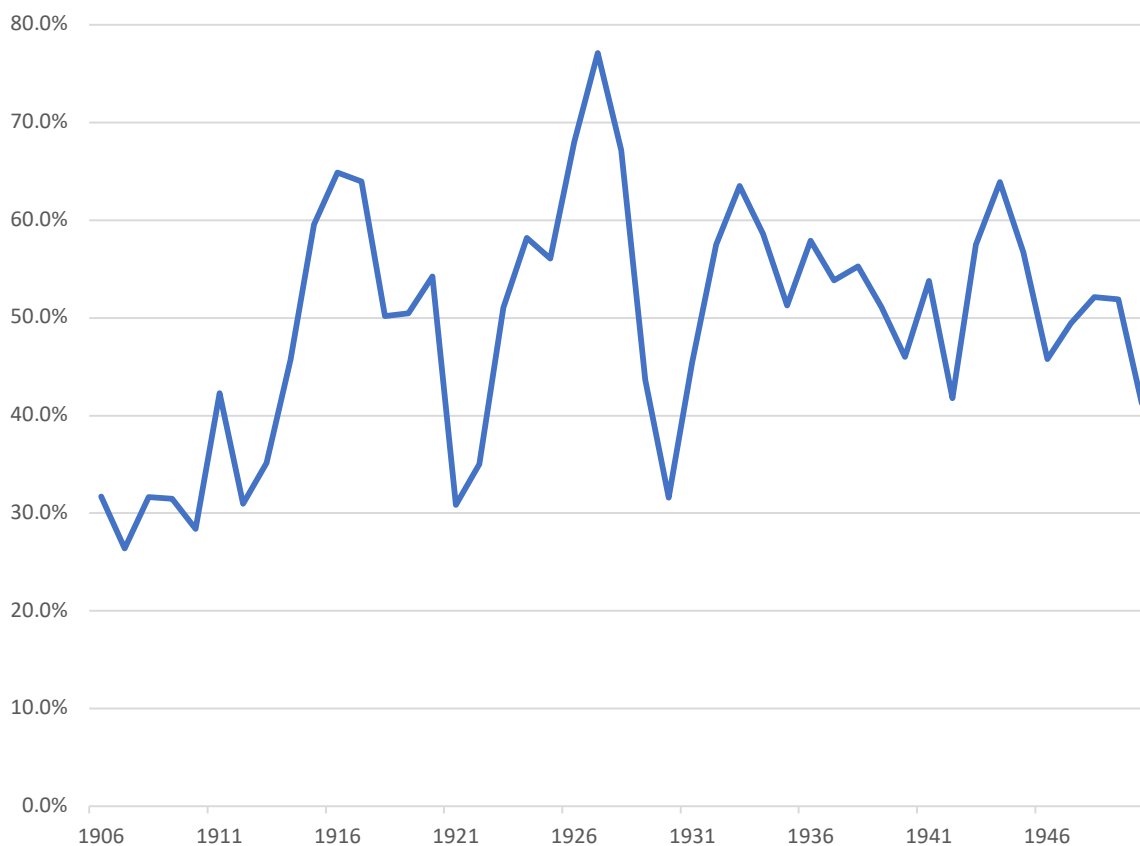
Alberta has a long history of economic cycles driven by commodity prices. Currently oil and gas price fluctuations loom large, but in the province’s early history, agriculture was dominant. Figures 3 and 4 illustrate the importance of farm income to the provincial economy up to 1950 and the price volatility experienced by wheat producers throughout this 40-year period (Ascah,1999, Chart 4.1). Borrowing difficulties began in the early 1930s with the collapse of wheat prices which had underwritten the great expansion of the Province’s economy. Wheat prices peaked at \$1.75 per bushel in 1928 (\$25.6 in 2020 dollars) which led to more immigrants into the young province seeking their fortunes. While agriculture’s share of provincial GDP is currently very low (about 1.8 per cent), having been supplanted by almost every other sector (especially oil and gas at 16.1 per cent of GDP), the lessons of the past continue to resonate.

Figure 3: Wheat Prices, CPI Adjusted, 1913-1950



Source: Hanson, 2003, pp. 61, 87,123, 160 and *Canada Year Book*.

Figure 4: Value of Agriculture as Per Cent of Provincial Income, 1906-1950



Sources: Provincial Income, Boothe, Table 2.3. 1906-1918: Net Value of Agriculture, Hanson Tables 2.2, 5.4; 1921-1935: Value of Field Crops, Hanson, Tables 4.2, 5.2; 1936-1950, Statistics Canada, Series M99-108. Realized farm gross income, 1926 to 1974

4.2 FIRST DEBT CRISIS

The existence of multiple pay bonds, entitling the holder to receive payment in either sterling, U.S. or Canadian dollars, dealt a serious blow to the province's finances in the early 1930s. These payment option choices caused principal and interest payments to rise well beyond what was anticipated (Hanson, 294).⁵

The 1 April 1936 default represents the first fiscal crisis in the province. The Alberta government refused to meet the contractual requirements of direct and guaranteed debt after desperate efforts were made to avoid default (Hanson 175-76). The Aberhart government declared it would not submit to domination by banks, the Dominion Government and eastern lawyers representing both banks and the Dominion. It was an audacious move sending shivers down the backs of investment bankers in London and New York, Canada's new central bank governor, and Canada's banking establishment. This fiscal crisis demonstrated how closely Dominion and provincial governments' creditworthiness are related.

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Between 1929 and 1936, the fiscal year just before the default, debt charges rose by 46 per cent.

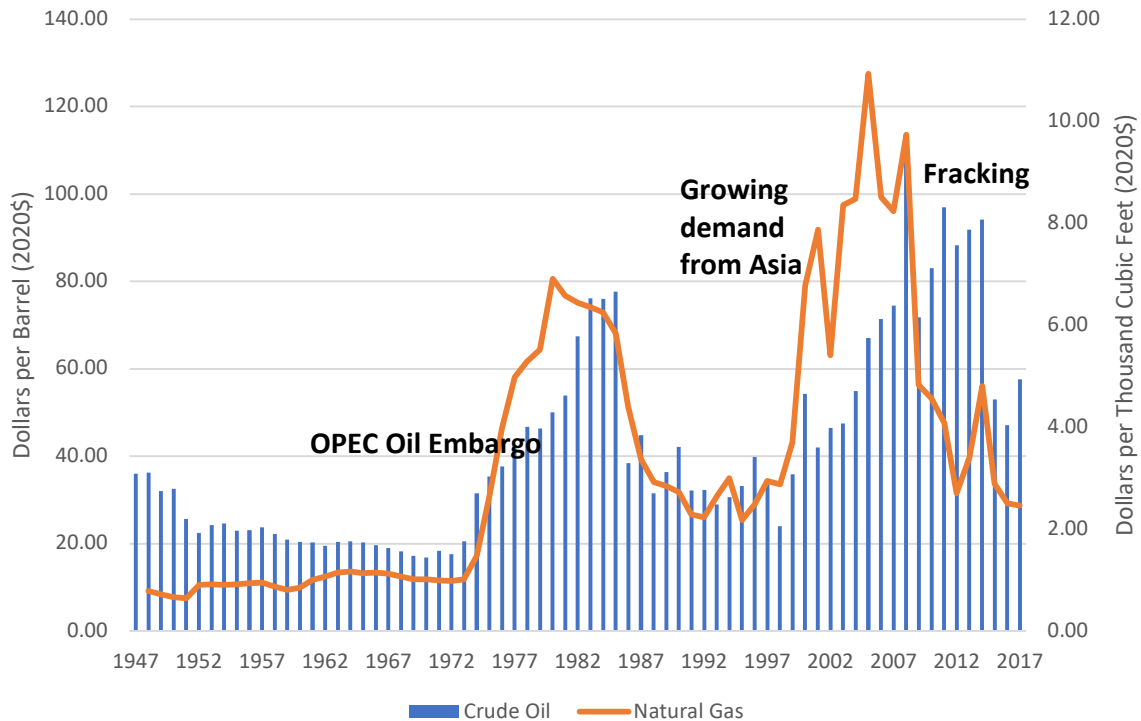
The provincial Cabinet quickly adopted a balanced budget philosophy to safeguard the Province's capacity to function within its jurisdiction. It ran balanced budgets, including providing for sinking funds to pay back the debt. From 1936 to 1946, when the Debt Reorganization Program took effect, the Social Credit government ran 10 surpluses, with a budgetary surplus in 1946 reaching \$6 million or 20 per cent of revenue (1953-54, *Public Accounts*, Statement No. 18). This was in sharp contrast to the preceding six consecutive deficits of the UFA government. The Social Credit's adherence to balanced budgets, the 1946 Debt Reorganization Program, and sharp rise in royalties after 1947 helped to eliminate the net debt by 1953.

4.3 OIL BECOMES AN ECONOMIC DRIVER

Alberta's financial situation improved dramatically as resource rents became a dominant source of revenue after the discovery of oil at Leduc in 1947. Figure 5 illustrates oil and natural gas prices over a 70-year period. The chart shows the strong price environment for oil and natural gas which super-charged the Alberta economy, enriching the provincial treasury. The economic expansion was fueled by capital investment of the energy industry supplemented by construction in residential, commercial, institutional, and industrial sectors. However, with the impact of the National Energy Program in the early 1980s and then the later collapse of energy prices, Alberta suffered one of its most serious downturns and the provincial government's public finances suffered greatly.

Alberta's finances continued to be problematic with significant deficits and accumulating debt. By the early 1990s there was a growing public and political consensus that deficits and rising debt were a serious problem. Moreover, consensus emerged that the government must deal with the issue quickly and vigorously. The so-called Klein Revolution (retrenchment) lowered government spending and, with rising oil and natural gas prices, a series of growing fiscal surpluses allowed rapid pay down of the province's debt.

Figure 5: Average Prices of Oil and Natural Gas, Western Canada, CPI Adjusted, 1947-2017

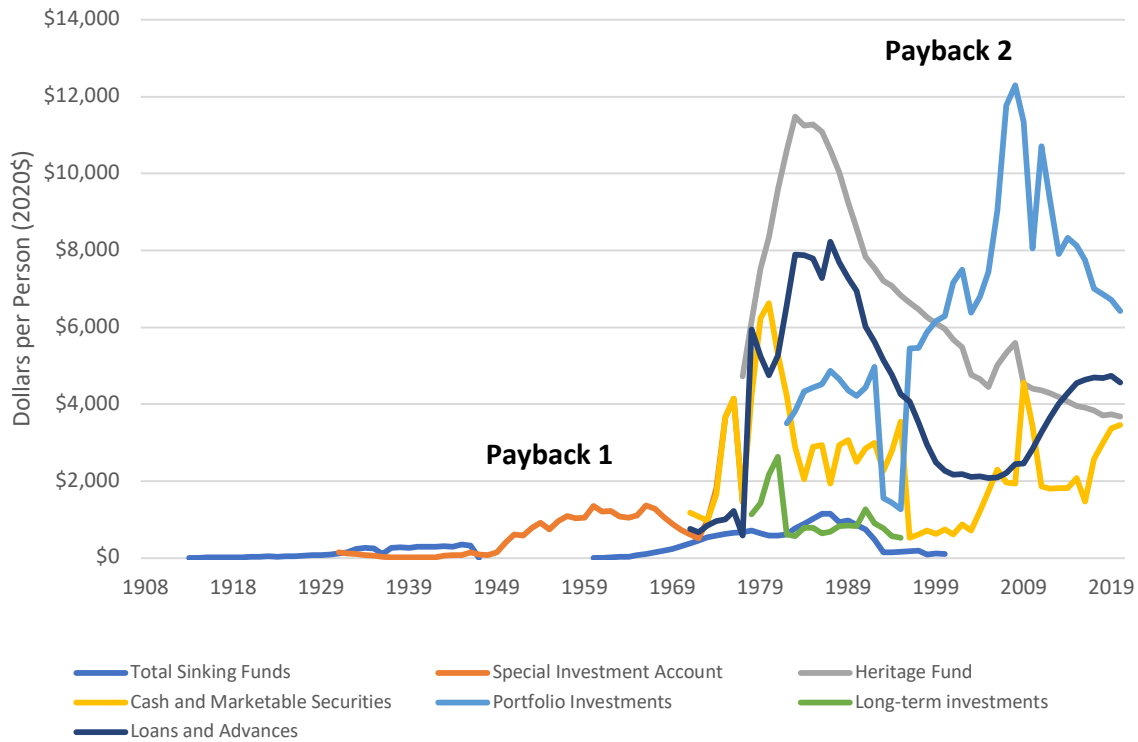


Source: Canadian Association of Petroleum Producers, <https://www.capp.ca/resources/statistics/> Accessed 3 April 2021.

4.4 FINANCIAL ASSETS

With the growth of royalties revenues associated with the rise of oil and gas prices (Figure 5) and concomitant expansion of the oil and gas industry, the Alberta government began a significant accumulation of financial assets. The Alberta Heritage Savings Trust Fund was established in 1976 by the Lougheed government. Critical in the evaluation of financial assets is whether they are claims on an external third party or a claim on an emanation of the provincial Crown. In the case of sinking funds, a mechanism to ensure repayment of a debenture (bond) at maturity, the debtor invests in its own debt (*Public Accounts*, 1932, Statement No. 16) to retire an issue of the debtor. However, are guaranteed debentures of AMFC secured by loans to Alberta municipalities truly loans to an external third party? ATB's loans are the loans to Alberta taxpayers — how then is one to assess the quality of the offsetting loan security, for example Alberta commercial real estate or Alberta oil and gas wells or drilling rigs? Under situations of regional financial duress, such as the Great Depression or the severe contraction of the provincial economy in the 1980s, the question is how much of an offset should these loans be accorded, particularly if the debtor population is seeking a debt moratorium? While these scenarios are rare, they are more likely than a casual observer might think.

Figure 6: Government of Alberta Financial Assets Per Capita, CPI Adjusted, 1908-2020



Sources: *Public Accounts of Alberta, 1908-2020*. Population: Dominion Bureau of Statistics and Statistics Canada. CPI deflator: Boothe, Table 2.3 and Bank of Canada Inflation Calculator <https://www.bankofcanada.ca/rates/related/inflation-calculator/> Accessed 31 March 2021.

Given the uncertainties in when and how financial claims will be made on the Province as debtor or as guarantor, two financial asset streams, which reflect changes to accounting presentation, are defined. In the first classification, I have aggregated sinking funds, Special Investment Account (1931-1977) and the Heritage Fund (1977-present) as a narrow definition of financial assets. The second, broader classification is based on accounting treatment starting in 1975 which sets out cash and marketable securities, portfolio investments, long-term investments, and loans and advances⁶. The challenging part is that some financial assets are securities issued to the Heritage Fund, such as those of the housing corporation or AGT issued during the Lougheed administration. The expansion of financial assets takes place during the 1950s to 1970s and the early 2000s,⁷ consistent with the payback periods.

⁶ I have excluded equity in commercial enterprises principally because of the inherent vulnerability of ATB's loan book to downturns in the provincial economy and current significant exposure to oil and gas loans and commercial real estate.

⁷ During the early 2000s, with bountiful natural gas prices, rebounding oil prices, and vast new oilsands investments, a number of investment funds were set up including the Debt Retirement Fund and the Stabilization Fund which housed residual surpluses of the Province. Other endowment funds were created, such as the Alberta Heritage Science and Engineering Research Fund. However, I have excluded endowment funds since they are conceptually perpetual endowments which would not legitimately be offsets to pay down debt.

4.5 ENVIRONMENTAL LIABILITIES

The discussion so far has ignored additional indirect or contingent liabilities of the Government associated with the cost of environmental remediation of hundreds of thousands of oil and gas wells, as well as pipelines and oil sands facilities. Recent stories⁸ on environmental liabilities concerning the oil and gas and oilsands sector beg the question of *how* and *whether* such liabilities might be factored into Alberta's credit rating.⁹

Each rating agency takes a slightly different approach to examining environmental, social and governance (ESG) issues, an evolving approach to how corporations respond to stakeholders as opposed to shareholders' interests (Carney, 383-417). Moody's and S&P ratings consider GHG emissions, carbon transition, waste, water, and land use. S&P and Moody's have a specific ratings system (Moody's, 2020; S&P, 2020). For governments, attention is paid to risk events where a material, financial impact would be felt, including costs arising from natural disasters like floods or forest fires. Particular consideration is given to hydrocarbon "sovereigns" like Alberta or Saudi Arabia whose finances will be affected by global decarbonization trends. Special attention in Alberta's case would be "the likely credit impacts that regulatory frameworks and ESG-related laws, policies and regulations will have on rated issuers and sectors as a whole" (Moody's, 5).

The question of how to measure environmental liabilities of Alberta's oil sector is controversial since there is a wide range of estimates for the cost of clean-up. Furthermore, how does one quantify the Alberta government's exposure to clean-up costs where the regulatory structure and jurisprudence support a polluter pay concept (Supreme Court of Canada)?

Table 1 presents two estimates of industry liabilities for clean-up costs. The first column is the official estimates of the Alberta Energy Regulator (AER). The second column is an estimate prepared by the Alberta Liabilities Disclosure Project (ALDP, 2018). The results of the ALDP analysis are based on internal estimates by the AER's then Vice-president of Liabilities (Wadsworth; de Souza et al). The main differences between the two columns are: 1) AER does not include thousands of pipelines; 2) for oil and gas wells, the ALDP combines the reclamation estimates commissioned for the AER's internal study with ADLP's private sector study and Orphan Well Association (OWA) abandonment cost estimates. This results in average well clean-up cost of \$82,722 in the AER estimate compared to a range of \$160,229 to \$279,086 estimated by the ALDP; and 3) bitumen estimate taken from Wadsworth study and extrapolated back in time based on the cumulative production of bitumen (ALDP). At present, the security posted by energy companies against these liabilities is about \$2 billion. It is highly questionable, given the record of the AER in ensuring smaller producers are financially capable of meeting

⁸ There have been many investigative stories about the AER including de Souza *et al*, Jones, Lewis and Jones, and MacIntosh.

⁹ Environmental, Social and Governance (ESG) rating methodologies are in their infancy but gaining more attention and have more potential for downside credit risk than upside risk. "Site remediation, for example at chemical plants, oil refineries or nuclear power facilities, can create large clean-up liabilities for their owners or insurers, which could transition to governments if companies fail to fulfill their obligations" (Moody's, 10).

their reclamation obligations, that this security is sufficient to defray large capital expenditures to remediate oil wells and oilsands mines and facilities.

Table 1 AER Estimates and Internal AER Estimates of Environmental Liabilities

Years	AER O&G + Bitumen Total (\$millions)	Wadsworth / ALDP Total (\$millions)
Up to 1991	9,843	56,070
1992	10,379	58,575
1993	11,127	61,670
1994	12,038	65,244
1995	12,877	68,504
1996	13,806	72,056
1997	14,958	76,383
1998	16,094	80,695
1999	17,261	85,062
2000	18,772	90,599
2001	20,411	96,402
2002	21,940	101,883
2003	23,833	108,505
2004	26,182	116,690
2005	28,494	124,681
2006	30,986	133,337
2007	33,211	141,233
2008	35,272	148,579
2009	37,002	155,011
2010	38,971	162,250
2011	41,135	170,168
2012	43,368	178,457
2013	45,670	187,076
2014	48,013	195,806
2015	50,453	205,280
2016	52,815	214,552
2017	55,594	225,281
2018	58,288	236,068

Sources: Column 1-Regan Boychuk (2018) and Column 2-Wadsworth with historical data from Boychuk (2018).

The wide disparity between the AER estimate and Wadsworth’s was quickly disavowed by the AER in November 2018 when Wadsworth’s presentation was released under access to information legislation.¹⁰ The vast differences between the two set of numbers suggests caution in ascribing future clean-up costs and what portion, if any, would fall back on Alberta taxpayers. There is considerable doubt about the capacity

¹⁰ <https://www.aer.ca/providing-information/news-and-resources/news-and-announcements/news-releases/public-statement-2018-11-01> Accessed April 11, 2021. See also De Souza et al. (2018).

and willingness of small producers to fulfill their regulatory obligations when many small producers remain delinquent on rural municipal taxes. Contributing to higher probabilities that Alberta taxpayers may foot part of the reclamation cleanup is the exercise of AER's regulatory discretion when applying its liability management ratings¹¹ to small oil and gas companies. To date, the Alberta government has provided over \$300 million of loans to the OWA to speed up the orphan well reclamation effort. In April 2020, the federal government stepped in to provide \$1.7 billion to four oil and gas producing provinces (\$1 billion to Alberta) to speed up the reclamation clean-up employing thousands of unemployed oilpatch workers to do so. Although the likelihood of these large liabilities turning into valid legal claims against the provincial government may be remote, the reticence of the Government, and its agent the AER, to enforce security may form the basis of future legal claims against the Crown by landholders and First Nations directly affected by perceived regulatory failures.

4.6. NET DEBT (ASSETS) 1992-2017

Net debt/assets results from subtracting government's financial liabilities from its financial assets. There are a range of outcomes for when a liability guaranteed by provincial government will become payable. Questions arise with respect to the qualitative nature of financial assets appearing on the province's balance sheet. The deposit liabilities of ATB, loans to regional airport authorities and loans to large urban and rural municipal governments facing an eroding tax base should be examined separately. The political calculation when dealing with debtors who are agents of the Crown, ATB borrowers, voters, municipalities or regionally influential corporations may expand the net of government liabilities by precluding the realization of security provided.

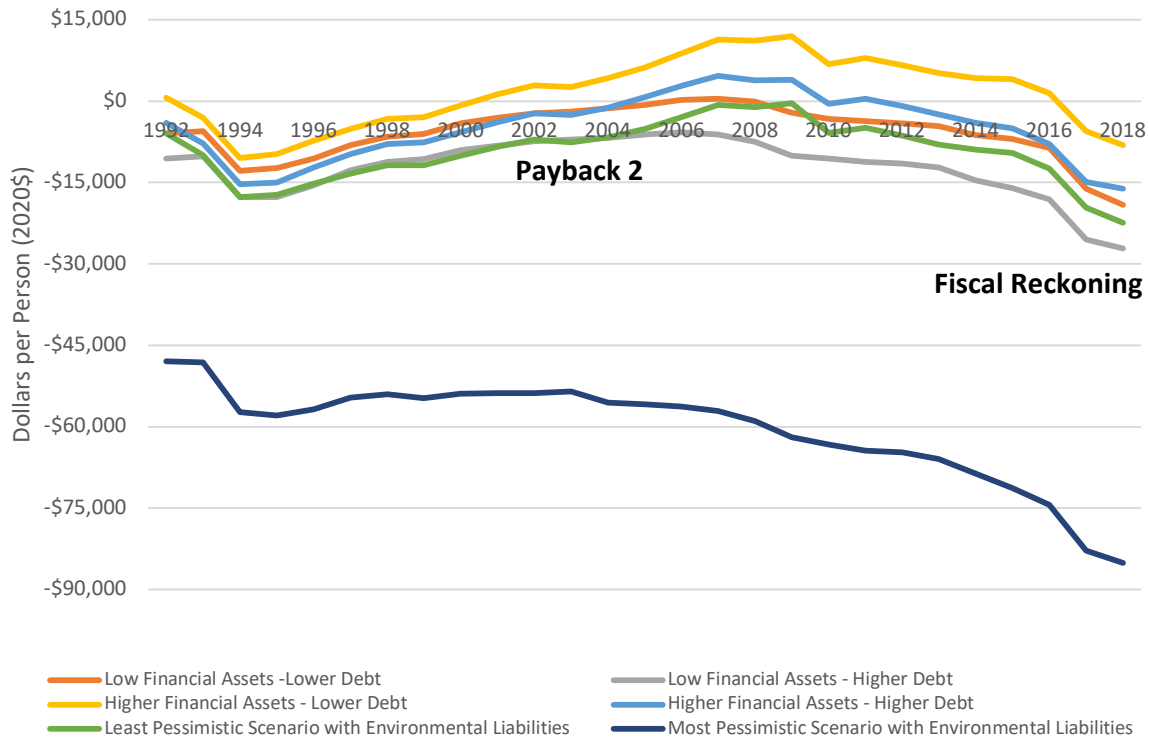
Figure 7 presents the 1992-2018 period with the estimates of environmental liabilities taken from Table 1. Guaranteed debt is calculated in two ways — with and without ATB deposit liabilities. Financial assets are grouped into two categories: the first is a narrow definition including sinking fund assets, Special Investment Account and the Heritage Fund; the second includes the sum of cash and marketable securities, portfolio and long-term investments and loans and advances. Four net debt/assets scenarios are presented which hug together closely. In addition, the total lower range of estimated environmental liabilities is added to less pessimistic net debt scenario and the total higher environmental liability range is added to the most pessimistic net debt definition. These scenarios are illustrative to show the relative magnitude of how the Government of Alberta's liability management strategy could change as major energy assets become stranded.

Figure 7 provides some context for future discussions about Alberta's long-term fiscal sustainability if such potential liabilities are not addressed through vigorous enforcement of the security requirements for large- and small-scale producers.

¹¹

The liability management rating is used by the AER to help assess a company's ability to address its abandonment, remediation and reclamation obligations. AER's administration of the program has come under criticism in the media.

Figure 7: Net Debt/Assets including Environmental Liabilities, CPI Adjusted, 1992-2018



Sources: Debt, guaranteed debt and financial assets- *Public Accounts*, various years. Population: Dominion Bureau of Statistics and Statistics Canada. CPI deflator: Boothe, Table 2.3 and Bank of Canada Inflation Calculator <https://www.bankofcanada.ca/rates/related/inflation-calculator/> Accessed 31 March 2021.

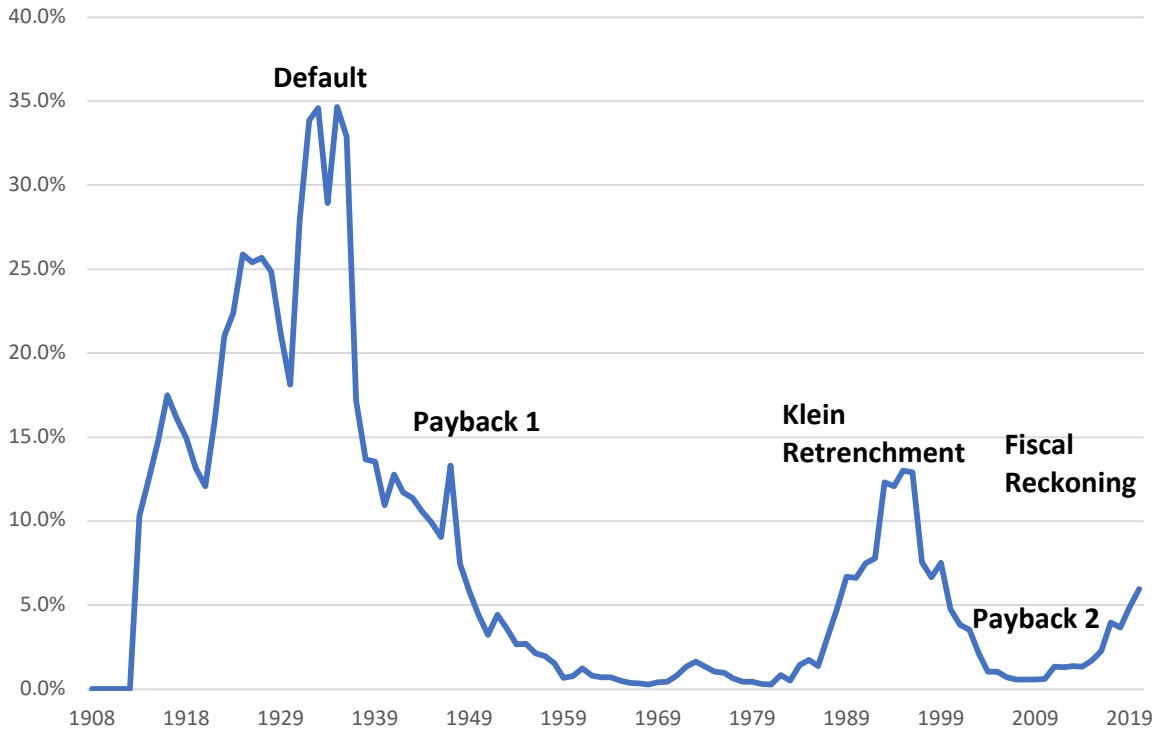
4.7 2006-PRESENT: BOOM AND BUST AGAIN

The present period of rapid debt accumulation began with falling real oil prices that coincided with the global financial crisis in 2008 and the emergence of fracking in the U.S. driving natural gas prices down precipitously. Offsetting the decline in natural gas investment was a massive expansion in the oilsands centred in the Fort McMurray area. Alberta's debt has grown significantly throughout the 2010s even with bountiful energy royalties up until 2015. Debt accumulation accelerated since 2015 when oil prices dropped again on a sustained basis.

4.8 REVENUE SUPPORTING REPAYMENT

Figure 8 shows a key metric for investors and rating agencies: the relationship between the costs of debt servicing and the revenue required to pay interest on the outstanding debt, to repay principal and to refund maturing debts. The figure shows the dramatic upward shifts when resource prices fell and significant declines when resource prices were buoyant. As with the previous figures, these movements correspond to periods of accumulating debt and periods when debt was retired and financial assets began to build.

Figure 8: Government of Alberta Debt Charges as Per Cent of Alberta Government Revenue, 1908-2020



Source: *Public Accounts of Alberta*, various years and Kneebone and Wilkins, 2018.

4.9 DEBT AND PROVINCIAL INCOME

Figure 9 compares different measures of public debt with the capacity of the provincial economy to service the debt. The data shows the relationship between movements in the economy and the fiscal situation facing the province. What has occurred repeatedly in Alberta is the coincidence of accumulated debt with an accompanying decline in provincial income. Alberta's commodity-based economy is particularly vulnerable to undesirable fiscal outcomes as political leadership responds to public demands for services and infrastructure funded by revenue projections which have failed to materialize.

Table 2 - Alberta's Credit Ratings 7 July 2021

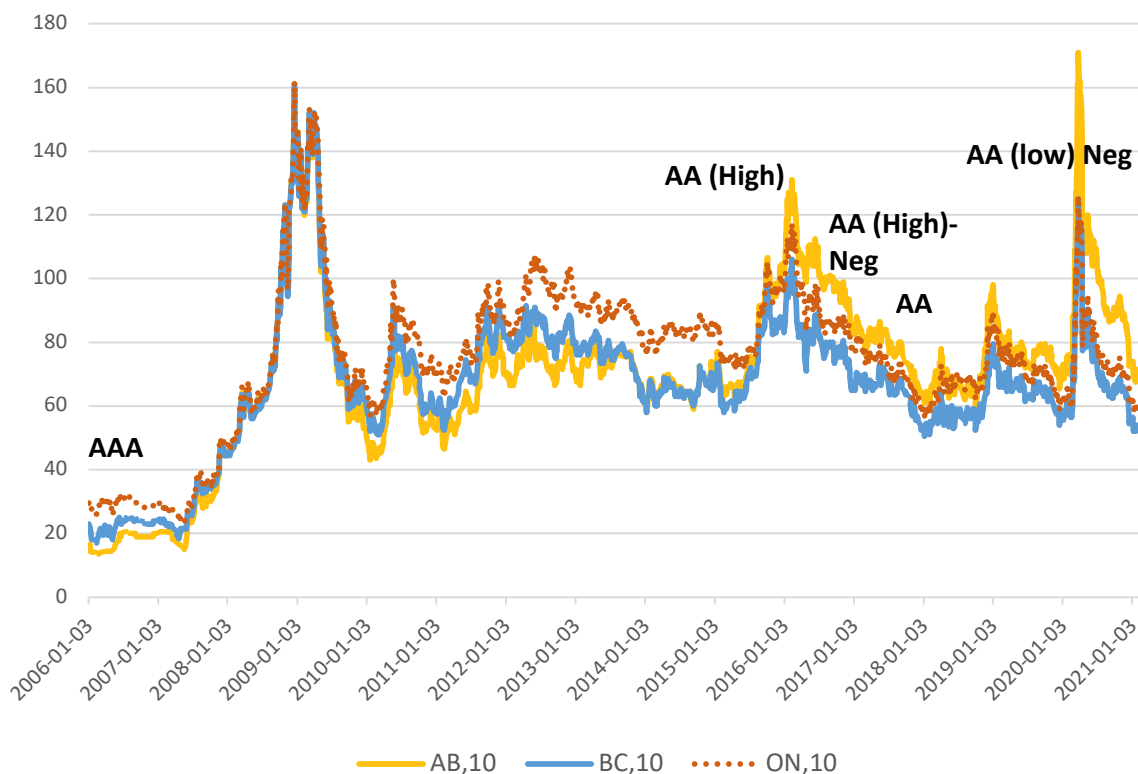
Agency	Long-term Rating		Short-term Rating
DBRS Morningstar	AA	(Low) (negative trend)	R-1 (mid) (stable trend)
Moody's Investors Services	Aa3	(outlook stable)	P-1
S&P Global	A	(outlook stable)	A-1
Fitch Ratings Inc.	AA-	(outlook stable)	F1+

Source: Alberta Treasury Board and Finance, Investor Relations, accessed July 7, 2021 <https://www.alberta.ca/investor-relations.aspx>

From the security issuers' perspective, a lower rating makes it more difficult to sell bonds because institutional investor policies limit exposure to bonds with lower ratings, especially bonds below investment grade (below BBB). Credit ratings normally reflect the cost of borrowing relative to benchmark securities, such as Government of Canada bond issues of the same duration. Ontario, with a strong diversified economy, sound credit rating, and large volumes of securities has traditionally been viewed as the benchmark provincial security. Up until oil prices fell in late 2014, Alberta paper was trading at or below Ontario securities (Figure 10). This situation has reversed in the past 5 years and now, with more debt outstanding and more issuance expected, Alberta spreads are wider than they have been in the last 30 years, and higher than those in BC and Ontario. Ten basis points may seem a minor difference. However, when placed in the context of Alberta's current borrowing program (\$20 billion), a 10-basis point difference represents \$20 million in added interest costs on an *annual* basis. \$20 million is hardly a trivial matter for smaller government programs facing budgetary cuts.

As the figure shows, Alberta lost its AAA credit rating in April 2015 and its current rating is AA low (DBRS/Morningstar).

Figure 10: Ten-Year Provincial Bond Spreads (Daily) relative to Government of Canada, 2006-2020



Source: BMO Capital Markets.¹³

6.0 QUESTIONS

6.1 WHEN HAS GOVERNMENT BORROWED TOO MUCH?

The short answer is the public will not know until the Government finds it can no longer borrow. A famous Ernest Hemingway quote when asked how he went bankrupt goes: “Two ways. Gradually, then suddenly.” Financial events occur when a bank, government or business is no longer capable of paying its debts or its employees when due. (This happened to some Alberta school boards during the Great Depression). Rising credit spreads on debt is one indicator of financial stress and the market for credit default swaps attempts to price likelihood of default. However, it turns out that financial markets are not very reliable in predicting a financial crisis until a funding crisis is evident.

From the historical charts there is little doubt that Alberta’s finances are in very poor shape and arguably worse than the situation facing Ralph Klein in the 1990’s. In the words of Premier Kenney, Alberta is facing a “fiscal reckoning”. Bond markets tend to be forgiving, as the possibility of a federal bailout reduces bondholders’ fears that they will hold devalued securities (Hanniman, 2020, 283-284). What is decidedly different

¹³

Special thanks to Professor Kyle Hanniman of Queen’s University for making this information available to me.

in 2021, compared with the fiscal retrenchment under the Klein administration, is the historically low interest rates which mask future problems of refunding maturing debt.

6.2 WHAT WILL RAPIDLY RISING DEBT LEVELS MEAN FOR ALBERTA TAXPAYERS?

Rising debt levels will produce escalating debt servicing costs, alongside more debt issuance, especially if (when) interest rates rise. This will put pressure on the government to raise taxes, possibly including a sales tax and higher fees for government services. The squeeze produced by rising debt servicing means lower budgets for services provided by the Alberta government, including health and education. This prospect will have potential negative impacts on social mobility, economic inequality, economic growth and equality of opportunity.

6.3 WHAT ARE THE CRITICAL DEBT THRESHOLDS FOR THE PROVINCE?

There are no fixed indicators which definitively mean that a government can no longer borrow. There is an array of unpredictable factors that are national and international and outside the Alberta government's control. For example, what happens if the world's reserve currency, the U.S. dollar, no longer performs its function? What happens if technological change eliminates the need for fossil fuels as a key transportation fuel? From the proceeding analysis, it seems clear that, without fundamental changes to tax and expenditure policy, Alberta is near some sort of debt threshold, though there is some uncertainty precisely how near.

6.4 WHAT ROLE WILL CREDIT RATING AGENCIES PLAY AS THEY EVALUATE DEBT THRESHOLDS IN RELATION TO OTHER PROVINCES?

Rating agency opinions reflect their vantage point as experts who compare the creditworthiness of sub-national debt. Agencies' analytical capacity to dissect a government's accounting systems, knowledge of the underlying drivers in a government's capacity to manage its finances, combined with an international perspective are important factors in their evaluation. Other Canadian provincial governments are the most obvious comparator for Alberta debt given common accounting frameworks and intergovernmental fiscal arrangements. While an implicit federal guarantee makes it highly unlikely that a Canadian province will fall below an investment grade rating, agencies' insights enable markets to more accurately function by pricing their bids for these securities.

6.5 WHAT DO HIGHER DEBT LEVELS MEAN FOR THE ALBERTA TAX ADVANTAGE AND ALBERTA'S LONG-TERM ECONOMIC GROWTH?

Higher debt levels mean that Alberta's tax advantage will become difficult to sustain. The Government's narrative that Alberta is an expenditure outlier is being displaced by a growing public awareness that Alberta is also a revenue outlier.

Whether higher taxes will impair Alberta's long-term economic performance is beyond the scope of this study. This is a very controversial issue within public finance and

political science and, given the innumerable factors influencing investment and political decisions, confirmation bias may be a factor here in arguments for and against the low tax policy prescription. As Tombe (Tombe, 2020, 1085) has argued, if public debt is rising faster than real economic growth a government's borrowing ultimately becomes unsustainable: "At some point, abrupt changes in fiscal policy—either increasing revenues or decreasing program spending—would be required to avoid default."

6.6 WHAT IS THE ROLE THE FEDERAL GOVERNMENT PLAYS IN MONITORING PROVINCIAL DEFICITS AND DEBT LEVELS?

The recent financial stress in provincial funding in March and April 2020 involved central bank purchases of provincial securities. This action suggested some provinces, notably Newfoundland,¹⁴ were facing difficulties borrowing (Drummond, 2021; Hanniman, 2021). Although the federal government has been primarily focussed on the public health file and administering new spending programs, the Bank of Canada's willingness to buy provincial securities demonstrates that the federal state cares about provinces' capacity to tap capital markets. Canada as a whole faced financing prospects in March 2020 not unlike during World War II, with borders closed and financial markets on the point of seizing up. This was a scary period when national government and central banks became for a short while the only trusted debt issuers.

7.0 RECOMMENDATIONS

The paper has emphasized the interconnectedness of Alberta's fiscal situation and its economic circumstances. Here I present two proposals that may reduce the possibility of a future fiscal crisis: (1) issuance of commodity-indexed bonds; and (2) a return to mandatory sinking fund contributions.

The Alberta government's financial vulnerability is highly correlated to commodity prices. One method of managing the government's financial risk would be to pay low rates of interest when oil prices are low and higher interest rates when the economy and the Province's finances are buoyant. This "natural hedge" is one method of reducing future debt servicing costs when resource prices are low and remain low for some time.

Alberta voters may suffer from "fiscal illusion" in that they are generally unaware whether money used in providing services has been borrowed or raised through various taxes. For political actors facing difficult budgetary choices, borrowing presents an attractive choice in the sense that future governments and taxpayers may be forced to deal with consequences of over-borrowing relative to taxing. Borrowing allows difficult budgetary trade-offs to be deferred to the future. With exceptionally low interest rates, there has also been a perception that borrowing is practically free. Establishing rules to set aside significant funds each year for debt retirement would force politicians to make difficult budgetary choices (i.e., cut spending or

¹⁴ Muskrat Falls is a major source of NL's fiscal challenges underlining the importance of a broad consideration of what constitutes public debt.

raise taxes) earlier. Given Alberta's apparent inability to save resource revenue, the sinking fund requirement should be a statutory provision that would prevent deciding annually whether to contribute or not. This method would be achieved by embedding mandatory sinking fund contributions in debenture agreements.

8.0 CONCLUSION

Public debt matters. Public debt comes in many forms. Centralized control over public debt is necessary to inform budgetary discussions which tend to focus on spending rather than taking a wholistic view on how spending proposals may be financed. Rising public debt began in the 1920s to build the province's infrastructure and to foster economic development. However, expectations that the future would take care of itself were not fulfilled as the commodity-based economy was devastated by falling prices of wheat, natural gas, oil and bitumen.

The current fiscal crisis is similar to previous crises because prices for Alberta's principal export commodities have fallen and prospects for a recovery are increasingly uncertain. In addition, the expansion of oil sands is much in doubt, reducing the large capital investments which have driven economic growth and development over the first decade and a half of the 21st century. Grave uncertainty about future economic prospects, possible legal challenges to how the oil industry has been regulated and the environmental consequences of oil and bitumen extraction, will mount. These issues are tantamount to the reputational risks of the Province as a debt issuer.¹⁵ Although industry is responsible for reclaiming properties damaged through resource extraction, there is considerable doubt as to the adequacy of financial security pledged for reclamation and the capacity and willingness of industry to pay for oilsands remediation (Auditor General of Alberta, 2015, 25-33, 2021, 29-34). The uncertainty of who will pay will emerge as a critical issue for the Province's credit rating and its credibility as a steward of Alberta's natural endowments.

¹⁵

Kelsey Johnson of Reuters reported in November 2018 that Sweden's central bank had sold off Alberta government bonds. "Sweden's central bank sells off bonds from Canadian province over climate concerns." accessed April 13, 2021. <https://www.reuters.com/article/us-canada-bonds-sweden-idUSKBN1XN2O9>

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APPENDIX A – LAYERS OF PUBLIC DEBT

COMPONENTS OF PUBLIC DEBT

Direct debt — unsecured, direct obligations of the Crown in Right of Alberta. Source of repayment from revenues of provincial government including royalties, taxes, and fees. Debt issued through Finance Ministry. Issuance may be on behalf of the General Revenue Fund, other regulated funds, or other provincial agencies such as ATB Financial or the ACFA.

Guaranteed Debenture debt — usually unsecured but supported by financial viability of the borrowing entity. Examples include Alberta Government Telephones, Edmonton, Dunvegan & B.C. Railway, AEC Power, Irrigation Districts. Source of repayment from corporate revenues.

Guaranteed bank, credit union or ATB loans. Examples include loans to Dreco Energy Services, Regional Planning Commissions, small grain dealers, farmers, students. Source of repayment from borrowers, including any security taken (e.g., real property).

Liabilities or guarantees of Agents of the Crown. Examples include accounts payables of Crown agents, Toronto-Dominion Bank loan to West Edmonton Mall guaranteed by ATB, letters of credit or undrawn credit facilities provided by ATB. Source of repayment from financial assets of corporations.

CHAPTER 15

PUBLIC AND PRIVATE SECTOR WAGES: HOW DOES ALBERTA COMPARE TO THE “BIG 3” PROVINCES?*

Richard E. Mueller

* The analysis presented in this paper was conducted at the Lethbridge RDC which is part of the Canadian Research Data Centre Network (CRDCN). The services and activities provided by the Lethbridge RDC are made possible by the financial or in-kind support of the SSHRC, the CIHR, the CFI, Statistics Canada and The University of Lethbridge. The views expressed in this paper do not necessarily represent those of the CRDCN or its partners. I am grateful to Bev Dahlby, Ken McKenzie, Robert Mansell and Mel McMillan for providing useful feedback on a previous draft of this paper.

INTRODUCTION

In their recent work on the state of Alberta's public finances, MacKinnon and Mintz (2017) note that relative to other provinces, public sector salaries in Alberta are relatively high and that Alberta could have saved about \$2.1 billion in 2016 if public sector compensation was at the same level as the average of British Columbia, Ontario and Quebec. This point was further emphasized in the September 2019 report from the Blue Ribbon Panel on Alberta's Finances (2019). More commonly referred to as the MacKinnon Report, it argued that both the size and compensation of Alberta's public sector were larger than those of these comparator provinces. Both reports, however, use aggregated data that makes pinpointing any wage differences by occupation impossible. Ascertaining if and where any public sector wages premiums may exist requires a much more detailed and nuanced analysis.

The perennial work by the Fraser Institute on the topic (e.g., Palacios et al. 2019) offers the beginnings of such a detailed analysis. The authors utilize the Public Use Microdata File (PUMF) from the Labour Force Survey (LFS), aggregated over each of the 12 months of 2018, along with a simple human capital model with a dummy variable for public sector workers. They find that Alberta public sector workers earn wages 9.3 per cent higher on average than wages in the private sector, a figure which decreases to 6.2 per cent when union status is controlled. The LFS-PUMF, however, has two major limitations. First, it includes all public sector workers regardless of public sector definition. Thus, federal, provincial, local, Indigenous and (a small group of) international administration employees, as well as non-administration employees are all included in this definition. As a result, this estimate of the public sector wage premium is a weighted average of all public sector employees, regardless of level of government or function. For example, if (say) federal administration employees earn larger wage premiums, this could increase the overall premium while provincial employees may have no wage (or even a negative) premium. Second, while the authors do control for occupation and industry, there is a lack of detail which limits the usefulness of estimates for policy purposes since the results show the weighted average of all wage premiums (and penalties) without addressing how wage premiums may differ by occupation. Even if these estimates were done by occupation, the PUMF only includes a maximum of 40 aggregated occupations and thus lacks sufficient detail for our purposes. For example, teachers at all levels, college instructor, professors, and others in education are all considered one occupation ("professional occupations in educational services") in the LFS-PUMF.

Work by the Institute for Competitiveness and Prosperity (2012) is closest in intent to this research in addressing the wage premiums of various occupations in the public sector. It uses the LFS-PUMF over the 1997-2012 period to compare relative weekly earnings for public sector workers in Ontario, as well as in British Columbia, Quebec and Alberta. They limit their sample to include only those aggregated occupations which have significant representation in both the private and public sectors, a total of 18 two-digit (out of 47 in total) occupations using the 2006 National Occupational Classification System (NOCS). Using a standard human capital model, they find that these public sector earnings are generally higher in all provinces, with the exception of

Alberta where public sector earnings are either lower than those in the private sector or the gap between them is statistically indistinguishable from zero in all years, with the exception of 2008, the time of the international financial crisis when relative public sector earnings tended to spike. This paper also disaggregates the data into specific (albeit highly aggregated) occupations and finds that those in clerical occupations tend to have a weekly earnings premium, while those in managerial and professional occupations have a weekly earnings penalty. This pattern is found in Ontario and in the (aggregated) comparator provinces, although such details are not provided for any other province. Further, for policy purposes even this level of occupational detail in the PUMF may not be sufficient. For example, one of aggregated occupation groups includes lawyers, judges, psychologists, social workers, etc. Furthermore, the small numbers of some occupations in the private sector means that some comparisons were not made. Indeed, important occupations such as those in health care and education are largely not addressed in the study owing to these data limitations. Considering the number of public sector workers in these industries – and the importance they are playing in the current public sector debates in Alberta – this is a serious limitation. For example, Mueller (2019b) reports that about 64 per cent of Alberta’s 420,605 public sector workers in the LFS-PUMF in 2016 were involved in the educational services and health care and social assistance industries. Another limitation of this study is that public sector workers are aggregated so that comparisons with the private sector include both those involved in public administration at the various levels of government (federal, provincial, etc.) as well as those in non-administration roles (including the majority of teachers, nurses, etc.). This is problematic since public sector workers cannot be identified by function or level of government. Furthermore, real weekly earnings are used as the outcome variable with no control for weekly hours worked. This could underestimate the hourly wage premium for public sector workers since they do tend to work fewer hours per week compared to those in the private sector. Similarly, using weekly earnings will also tend to overestimate any Alberta wage premium since Albertans tend to work longer hours compared to the national average in both the public and private sectors.¹

The purpose of this research is twofold. First, to estimate the real wage premiums of the largest public sector occupations in Alberta compared to the same occupations in the private sector. For comparison purposes, this exercise is also performed for the three largest provinces: British Columbia, Ontario, and Quebec, the chosen comparators for much of what has been written on the topic recently (MacKinnon and Mintz 2017; Blue Ribbon Panel 2019). Second, to compare sectoral wages in Alberta with the other provinces, again using the largest public sector occupations in Alberta. Here we compare private sector real wages in Alberta to the other three provinces as well as the public sector wages using three definitions of the public sector: (1) the broad public sector which includes all employees in government administration at the federal, provincial, municipal levels, as well as a few individuals in international and Aboriginal

¹

Author’s calculations using the aggregated monthly data from the 2016-2018 LFS-PUMF (using the same restrictions listed below in the data section). Public sector workers over this period in Alberta worked about 1.25 weekly hours less than those in the private sector. Overall, Albertans worked about between about 1 and 1.5 hours more those in British Columbia, Ontario and Quebec with the differential higher in the private sector.

administration, and the large number of individuals employed in non-administration; (2) only those in non-administration who are individuals in occupations related to education, health care, social assistance, and other non-administration occupations; and, (3) those employed in provincial administration.² It is these final two definitions that are important for policy purposes since these are largely under the purview of the provincial government. In sum, public sector wages relative to those in the private sector are estimated *within* each of Alberta and the three largest provinces are estimated, as are public and private sector wages *between* Alberta and the other provinces. Performing this exercise offers a much more detailed and nuanced treatment of public sector wage differentials in Alberta compared to the previous literature.

The findings suggest that public sector wages in Alberta are not, on average, out of line with public sector wages for comparable occupations in the three other provinces. When comparing wages within each province, Alberta public sector workers do tend to have higher hourly real wages compared to their private sector counterparts, but so do public sector workers in the three other provinces, and the overall public sector premium for Alberta is generally smaller. When comparing these wages across provinces, Alberta's public sector wages are often higher than those in other provinces, but not as high as the province's private sector wage premium. These wage patterns are consistent with the argument that a robust energy sector in the province inflated private sector wages and these spilled over into the public sector.

DATA AND METHODOLOGY

Since we are interested in comparing the public sector wage premium *within* each of the four provinces, as well as the sectoral wage differentials *between* Alberta and the other three provinces, two simple models are utilized. First, comparisons between Alberta and the other three provinces for each sector (when cell counts are at least 100 observations). Thus, we compare the private sector and the public sector (using all three definitions) in Alberta to the other three provinces as:

$$\ln w_i = X_i\beta + AB_i\gamma + \eta_i \quad (1)$$

where $\ln w_i$ is the natural logarithm of the real hourly wage of the i^{th} individual, X_i is a vector of individual and job related characteristics, β is the rate of return to these characteristics, AB_i is a dummy variable for individuals in Alberta, γ is the Alberta wage differential within each sector relative to the comparator provinces, and η is the usual error term. This model is first estimated with all occupations that meet the inclusion criteria, and then estimated again by occupation where sample sizes permit.

²

See Mueller (2019a) for details on how these categories are constructed.

Second, the standard human capital model is again used to compare the public sector wage premium within each province:

$$\ln w_i = X_i\beta + PS_i\delta + \varepsilon_i \quad (2)$$

where $\ln w_i$, X_i and β are as above, PS_i is a dummy variable for those in the public sector, δ is the wage premium or penalty for public sector employment in comparison to employment in the private sector, and ε_i is the usual error term. This model is estimated using the aggregated data and then again by comparing the public sector premium for each occupation and province.

The vector X_i includes controls for highest level of education attained, age and its square, landed immigrant, sex, marital status, economic family type, survey year, survey month, province, urban status, firm size, job tenure and union status. Occupation is also included a control in the aggregated estimates. The inclusion of union status is important given that public sector employees are much more likely to be unionized than their counterparts in the private sector (Mueller 2019a). Furthermore, those occupations that are concentrated in the public sector (e.g., health and teaching professionals) have among the highest public sector unionization rates (Card, Lemieux and Riddell (2020).

To remove any ambiguity in what follows, the public sector *premium* refers to the within province estimates of the payment to public sector workers compared to their observationally equivalent private sector counterparts, while the *wage differential* is used when comparing the wages of Albertans with the wages of those in the same sector in the comparator provinces. As shown below, for example, Alberta nurses in the public sector have an estimated wage premium of 5.1 per cent relative to those in the private sector in Alberta but have a 1.5 per cent wage differential compared to public sector nurses in British Columbia.

As mentioned above, the public sector is defined in three separate ways: all public sector workers employed in federal, provincial, local, Aboriginal, or international public administration, as well as those who are in the public sector but not involved in administration. This latter group would include those who work for government-funded entities such as hospitals, school boards, universities, and colleges. Since most of these are under the purview of the provincial government, separate estimates will be done for this group relative to the private sector. For the same reason, provincial public administration will also be separately compared to the private sector. In the figures and tables below, these are labelled as “all public”, “non-administration”, and “provincial”.

Data from the master files of the Labour Force Survey for the 36-month period between January 2016 and December 2018 are used.³ The LFS is a compulsory monthly survey of approximately 56,000 households and includes all non-institutionalized individuals and civilians aged 15 or over. We limit our sample to those individuals between the ages of 25 and 64. Full-time students were also removed from the sample.

³

These dates were chosen to overlap the time periods addressed in other recent analysis (MacKinnon and Mintz 2017; Mueller 2019b).

Real wages are in 2002 dollars are calculated by dividing the nominal hourly wage rate by the province-specific monthly consumer price index (CPI) for each month. This accounts for different inflation rates in each province. Individuals with real wages of less than \$5 per hour are dropped from the sample as are those who reported working fewer than five hours per week or more than 100 hours in the reference week. Survey weights are used throughout and robust standard errors are used in the regression results.

The other criterion for inclusion is that there are at least 100 observations in each occupation in Alberta and in the broad public sector definition when calculating the aggregate estimates. Only when there are at least 100 observations in each cell (i.e., for each occupation and for each sector) will these premiums be estimated. Again, these comparisons are done for the three public sector definitions for Alberta, British Columbia, Ontario and Quebec, for a total of 12 comparisons within for each occupation where the number of observations in each cell permit. For example, if there are 120 observations for secondary school teachers (NOCS code 4031) in the public sector, but only 80 in the private sector, this comparison will not be made. The Institute for Competitiveness and Prosperity (2012) also uses the LFS and compares public and private sector wages in occupations with a significant presence in both sectors (since there are many occupations that are not common in one sector or the other). This results in 18 (out of a total of 47) occupations at the two-digit level using the 2006 National Occupational Classification System (NOCS). In our data, there are 96 such occupations which meet the 100-observation threshold in the overall Alberta public service.⁴ The limitation here is that many occupations between sectors or within sectors but between provinces cannot be compared in what follows. This is likely not a serious problem since most of the major occupations – such as those in education and health care – are included and these are where the current Alberta government has focused its attention.

RESULTS

The estimation of the above two equations will result in several comparisons of private and public sector wage differentials. First, equation (1) gives the difference in the Alberta wage differential relative to the other provinces for the private sector as well as using three different definitions of the public sector using all individuals in the top 96 occupations. Next, where sample size permits (i.e., at least 100 in each occupation and in each comparator), between province wage differentials by occupation in each sector are compared. Second, the estimation of equation (2) allows the comparison of public sector wage premiums within each province as well the occupational public sector premium (again, where sample sizes permit).

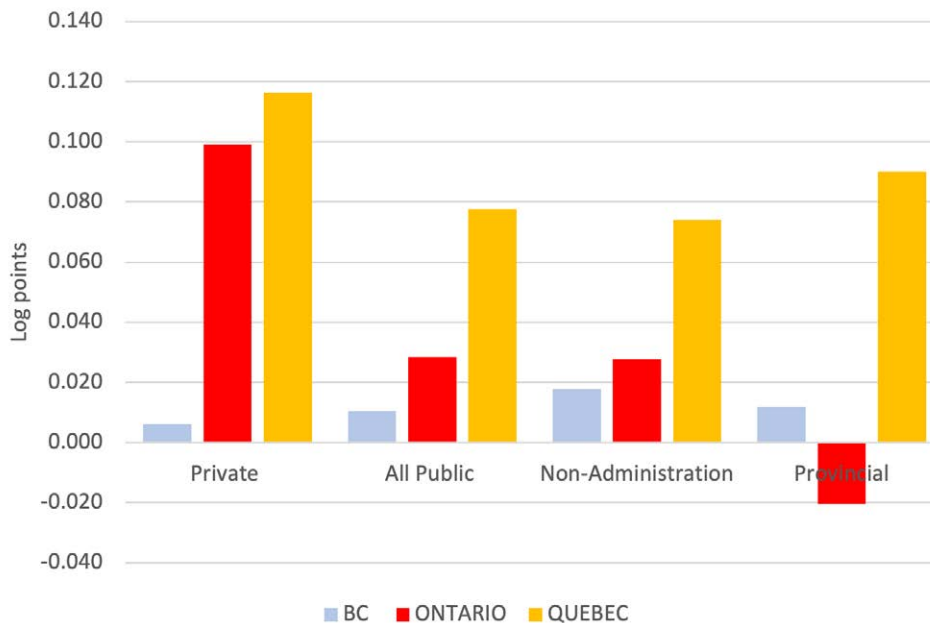
⁴

A detailed list of these top 96 occupations is found in Appendix Tables A2 and A4. We also performed this exercise with only the top 45 occupations (i.e., those with at least 200 relevant observations) and the results were very similar.

SECTORAL WAGE DIFFERENTIALS BETWEEN PROVINCES

Estimated wage differentials in various sectors between Alberta and the three other provinces are shown in Figure 1. There are four comparisons: the private sector, along with three definitions of the public sector. The first public sector definition includes all public sector workers who are not involved in administration as well as those at all levels of public administration – mainly federal, provincial and local administration workers. The non-administration public sector includes those largely involved in education and health care and include most of the public sector workers in Alberta (Mueller 2019a, 2019b). The final columns in the figure compare Alberta public administration wages at the provincial level. It is these latter two groups of public employees that are of most interest in the current work since their wages can be influenced by the provincial government, largely through the collective bargaining process. All results (except for the provincial coefficient for BC) are statistically different from zero at at least the five per cent level.

Figure 1: Alberta Wage Differentials Relative to the Three Largest Provinces, Top 96 Occupations



Source: Appendix Table A1.

Comparing wages in Alberta to those in British Columbia there are only small differences between the two provinces with wages about the same in the private sector and less than 2 per cent higher in the Alberta public sector using the first two definitions (the coefficient on provincial for British Columbia is not significantly different than zero).⁵ Compared to Ontario and Quebec, the Alberta wage differentials are larger (with the exception of provincial administration in Ontario). Indeed, compared to Quebec

⁵

Log points can be interpreted as an approximation of the percentage differences in relative wages. Thus, 0.02 log points represent approximately 2 percentage points. For ease of interpretation, percentages will generally be used throughout the remainder of this paper.

they are substantial, being in the 7.4-9.0 per cent range. Still, these are smaller than the private sector wage premium where Albertans in that sector have wages 11.6 per cent above those in Quebec and 9.9 per cent above those in Ontario.⁶

The next two figures contain the estimates of the sectoral wage differentials by occupation in Alberta relative to the other three provinces. To reiterate, comparisons are only made when there are at least 100 observations for each comparator occupation within each comparator province. We limit the sample to include only those occupations with at least 100 observations in Alberta using the broadest definition of the public sector. This gives a total of 96 occupations that can be matched with other jurisdictions. Equation (1) is estimated by occupation where this 100-observation threshold holds for both comparators. The vertical axis in each case is the log real wage differential, and the horizontal contains the occupations ranked by size from the largest (i.e., registered nurses and registered psychiatric nurses on the left hand side of the figure) to the smallest (i.e., automotive services technicians, truck and bus mechanics and mechanical repairs on the righthand side). Appendix A2 contains the ranking of each of these 96 occupations as well as the coefficient estimates presented below. Note that missing data points mean that the 100-observation threshold is not met for at least one of the comparator occupations.⁷

Figure 2a shows the comparison of within occupation wage differentials in the private sector between provinces.⁸ The horizontal axis has the 96 occupations ranked from largest to smallest and labelled as such, while the vertical axis is the log wage difference for each of these occupations between Alberta and the comparator province. At the far-left side, the largest occupation (i.e., registered nurses) has a 13.2 per cent differential compared to Ontario, a 6.7 per cent difference compared to British Columbia, and a 7.8 per cent difference compared to Quebec. In other words, private sector wages for nurses in Alberta are about 7 to 13 per cent higher than in the three comparator provinces. Nurses aides, orderlies and patient service assistants earn 2.5 per cent less in Alberta than in British Columbia, but 12.8 per cent and 20.1 per cent more than their private sector counterparts in Ontario and Quebec, respectively. Administrative assistants (the eighth ranked occupation) show an Alberta wage advantage of between 4.2 and 10.3 per cent relative to the other three provinces. The highest estimated wage premium for Alberta public sector workers is 35.5 per cent compared to Quebec for natural and applied science policy researchers, consultants and program officers, and the lowest is -26.7 per cent when compared to correspondence, publication and regulatory clerks in British Columbia.

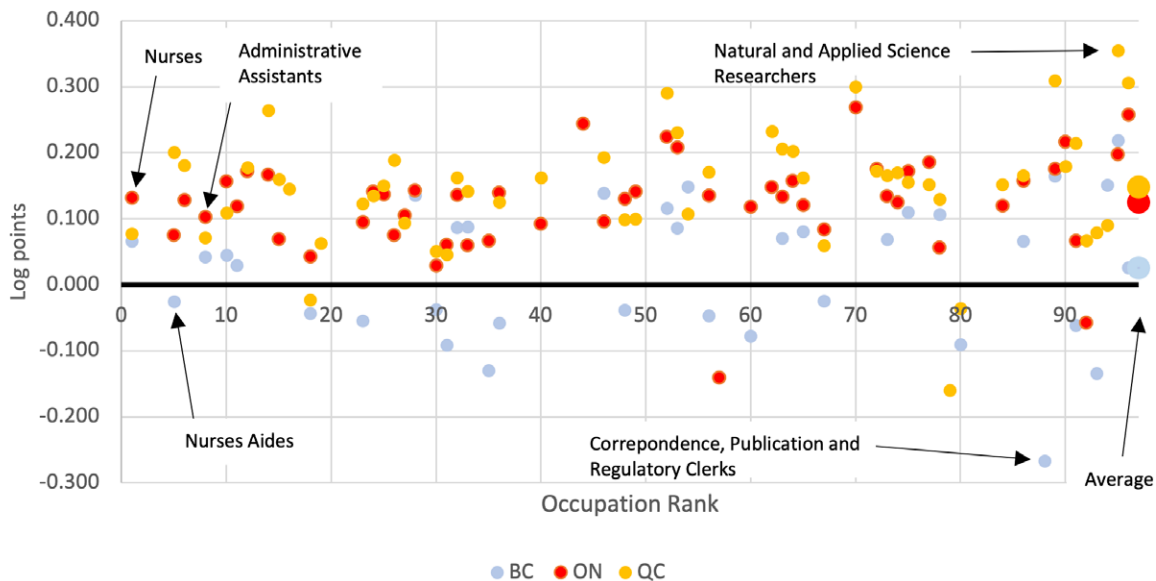
⁶ These results do not change markedly (either here or below) when we limit the sample to include only the top 45 occupations nor when regressions are estimated without occupational controls.

⁷ Separate graphs for non-administration and provincial administration are not included here. The former results are like those in Figure 2a while the latter has few comparisons owing to small sample sizes. These results, however, can be found in Appendix Table A2.

⁸ In doing the comparisons, there were 37 private sector occupational matches with British Columbia, 52 with Ontario, and 53 with Quebec.

Taking a bird's eye view of the scatterplot, we see that Alberta's private sector wages are similar on average to those in British Columbia and higher than those in Ontario and Quebec. Indeed, calculating a simple (i.e., unweighted) average of these premiums (see Appendix Table A2) shows that private sector wages in these occupations in Alberta are 2.6 per cent higher than in British Columbia, 12.5 per cent higher than in Ontario, and 14.8 per cent higher than in Quebec. This pattern is comparable to that observed in Figure 1 above.

Figure 2a: Alberta Private Sector Wage Differentials Relative to the Three Largest Provinces, Top 96 Occupations (where sample sizes permit)



Source: Appendix Table A2.

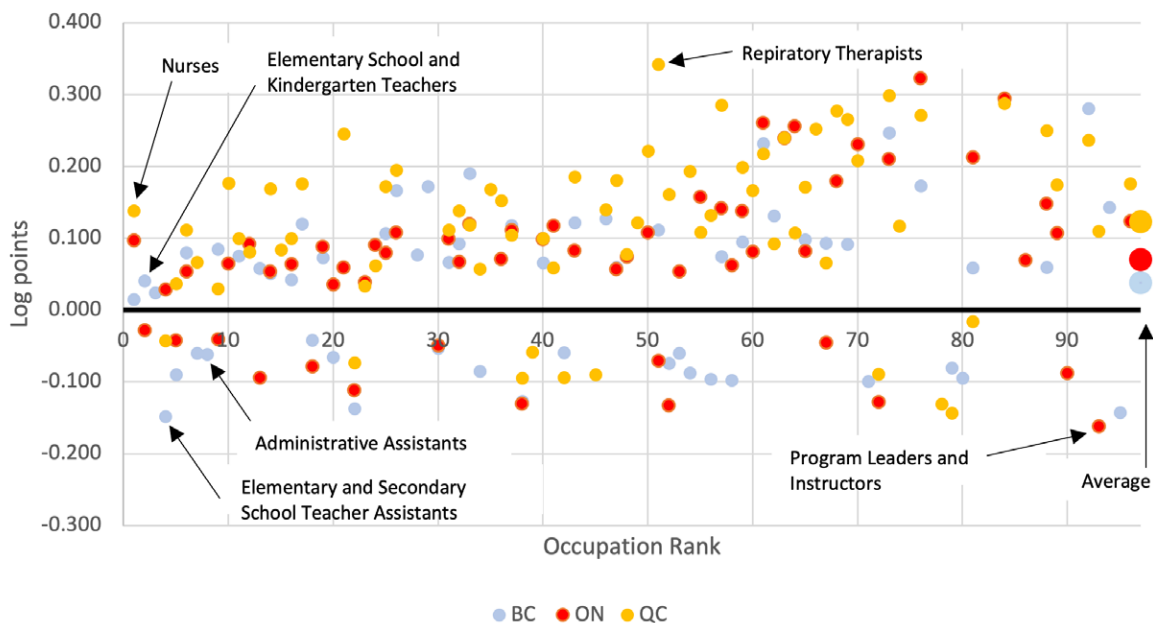
Figure 2b presents similar data, but for all public sector workers in each occupation that meet the criteria for inclusion. Here there is more overlap within occupations between provinces compared to the private sector comparisons above, mainly because several occupations (e.g., teachers) do not have large numbers in the private sector.

The first noteworthy item is that there are more occupations in Alberta where real wages are below parity with the other provinces compared to the private sector comparisons in Figure 2a. Again, a simple average of the data points in this scatterplot reinforces this point; real wage differentials in Alberta of 3.8, 7.0, and 12.3 per cent compared to British Columbia, Ontario, and Quebec, respectively. Recall that the relative Alberta private sector differentials in the previous figure were 2.6, 12.5, and 14.8 percent, respectively, higher than the figures here when comparing Alberta and Ontario and Quebec, and comparable to British Columbia.

In terms of some specific occupations, registered nurses and registered psychiatric nurses in the public sector in Alberta have a 1.5 per cent wage advantage compared to nurses in British Columbia, increasing to 9.7 per cent compared to Ontario and 13.8 per cent compared to Quebec. Comparing these to the figures for nurses above, the public sector differential in Alberta is higher than the private sector differential compared

to Quebec, but smaller when compared to British Columbia and Ontario. Elementary and secondary school teacher assistants in Alberta have real hourly wages 2.8 per cent above those in Ontario but lag their counterparts in British Columbia and Quebec by 14.8 per cent and 4.3 per cent, respectively. Elementary school and kindergarten teachers in Alberta earn 2.4 per cent more relative to their counterparts in British Columbia but are at par statistically with those in Ontario and Quebec. Administrative assistants in the public sector in Alberta have earnings 6.1 per cent less than in British Columbia, but comparable to their equivalents in the other two provinces. The largest differential is with respiratory therapists, clinical perfusionists and cardiopulmonary technicians in Quebec (34.2 percent) and the lowest with Ontario's program leaders and instructors in recreation, sport and fitness.⁹

Figure 2b: Alberta Public Sector Wage Differentials Relative to the Three Largest Provinces, Top 96 Occupations (where sample sizes permit)



Source: Appendix Table A2.

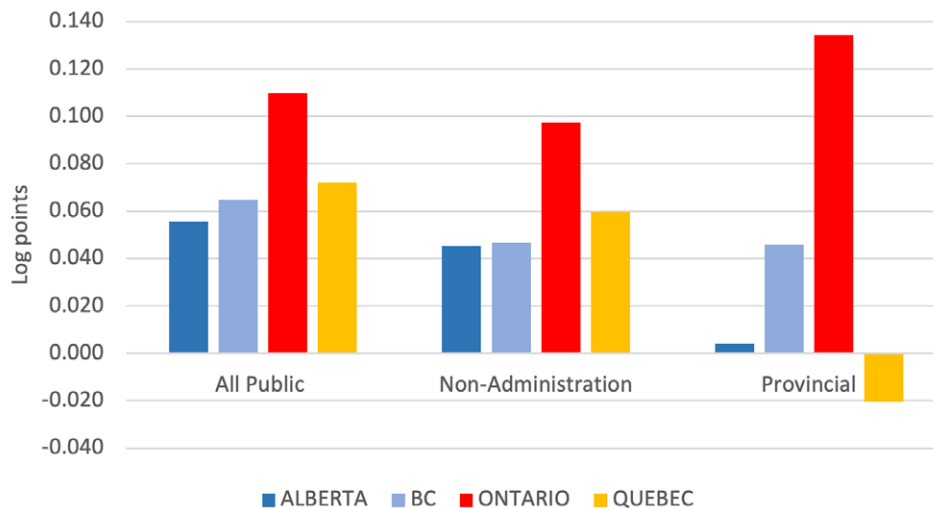
In sum, comparing wage differentials shows that overall public sector workers in Alberta tend to have higher wages on average than their counterparts in British Columbia, Ontario and Quebec. However, private sector wages in Alberta are also higher than those in Ontario and Quebec and this Alberta advantage is higher than for those in the public sector. Overall, public and private sector wages in Alberta are comparable to those in British Columbia. Within specific occupations, there are differences between provinces when comparing both the private and public sectors, but there does not appear to be systemic differentials for public sector workers in Alberta vis-à-vis the other three provinces.

⁹ See Appendix Table A2 for these and other comparisons.

PUBLIC SECTOR WAGE PREMIUMS WITHIN PROVINCES

Figure 3 compares public sector to private sector wages within each province, again limiting the sample to the top 96 occupations. All results are statistically significant at the one per cent level (except for provincial administration workers in Alberta). Except for provincial public administration workers in Quebec, public sector workers in all provinces and by each definition have non-negative wage premiums relative to the private sector, ranging from a statistically insignificant 0.4 per cent in the case of Alberta's provincial administration workers, to 13.5 per cent in the case of this group of workers in Ontario. Specifically, what is noteworthy is that, with one exception, the public sector wage premium tends to be the lowest in Alberta, and often by a sizeable margin.

Figure 3: Public Sector Wage Premiums Relative to the Private Sector, Alberta and the Three Largest Provinces, Top 96 Occupations



Source: Appendix Table A3.

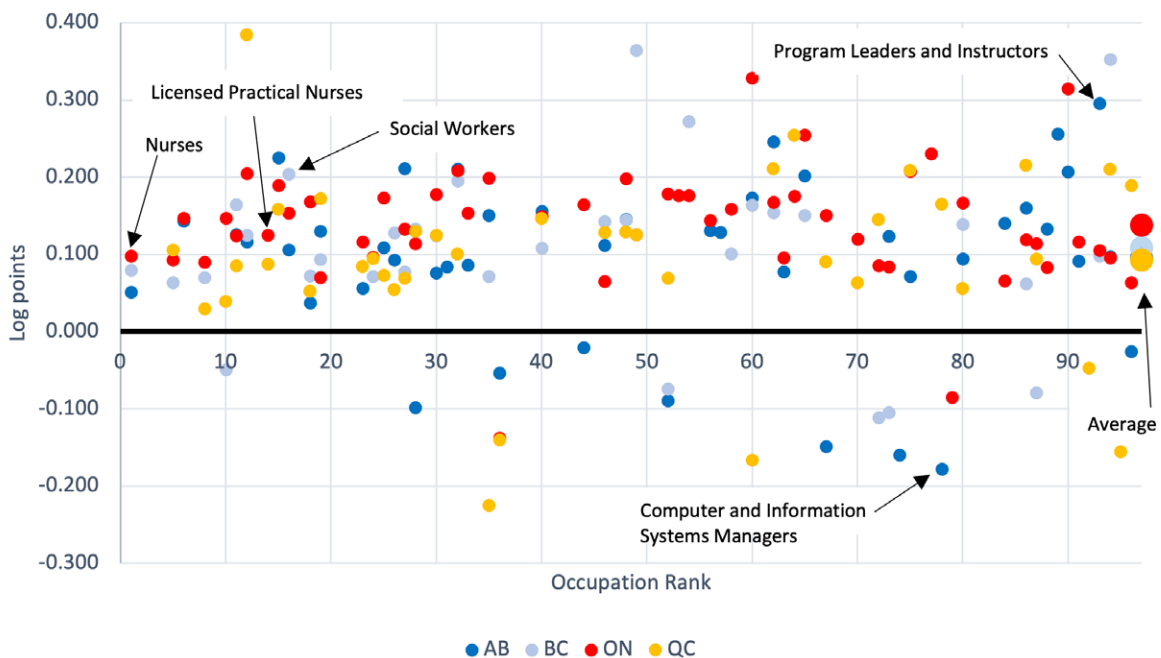
We perform the exercise of estimating any public sector wage premium by occupation using both the broad definition of the public sector, as well as the only non-administration public sector workers.¹⁰ Figure 4 presents these premiums by province for the broad definition of the public sector.¹¹ A simple unweighted average (see Appendix Table A4) reveals that this wage premium is 9.5 per cent in Alberta, smaller than the 10.9 per cent and 13.8 per cent premiums for British Columbia and Ontario, respectively, and about the same as the 9.3 per cent premium for Quebec. Again, the overall pattern here is like the results in Figure 3 with Alberta having among the lowest public sector wage premium among its comparator provinces. Overall, the Alberta premiums by occupation do not appear to stand out in any way compared to those

¹⁰ Results for those not involved in public administration as well as the few occupations where there is sufficient overlap of private and provincial administration workers are contained in Appendix Table A4. The results for non-administration workers are similar to those presented in this figure.

¹¹ In Alberta, British Columbia, Ontario and Quebec there were 45, 35, 54, and 39 occupations, respectively, that overlapped between the private and public sectors.

of the other three large provinces. There are, however, several outliers in Alberta with the largest premium being for program leaders and instructors in recreation, sport and fitness (29.5 per cent) and the lowest for computer and information systems managers (-17.8 per cent).

Figure 4: Public Sector Wage Premiums by Province, Top 96 Occupations
(where sample sizes permit)



Source: Appendix Table A4.

Looking at the results by selected major occupations, registered nurses and registered psychiatric nurses in the Alberta public sector earn 5.1 per cent more than those in the private sector, but comparable figures for British Columbia show a wage premium of 8.0 percent, with a 9.8 per cent premium in Ontario, and no statistical difference between the sectors in Quebec. Licensed practical nurses (LPNs) in both Alberta and British Columbia have no statistically significant public sector premium, while those in Ontario and Quebec have premiums of 12.5 per cent and 8.7 percent, respectively. In Alberta, social workers in the private sector have real hourly wages about 9 per cent higher than those in the private sector, while in British Columbia this premium is 22 percent, it stands at 15 per cent in Ontario, while in Quebec there is no premium.¹² A simple average of these coefficient estimates shows an overall Ontario premium of 13.8 percent, with premiums of 10.9 per cent in British Columbia and 9.3 per cent in Quebec, the latter two hiding the Alberta premium of 9.5 per cent in the figure.

Again, it appears that public sector wages in Alberta do not stand out in any systemic way. Where comparisons are available, public sector wages in all four provinces tend to be higher than those in the private sectors in those same provinces (as evidenced by

¹² See Appendix Table A4 for details on the overall public sector premiums for all occupations as well as for those not involved in administration and for those employed in provincial administration.

the number of plots above the parity line in Figure 4). If anything, public sector workers in Alberta tend to have premiums on the low side relative to the other three provinces.

CONCLUSIONS

Using data from the 2016-2018 monthly Labour Force Survey and including in the analysis only the 96 largest public sector occupations, we find that when comparing public sector real wages in Alberta to those in its three comparator provinces they do tend to be higher. But so too are comparable private sector wages in Alberta relative to these other provinces. By addressing the wage differentials between provinces in each occupation, we find larger differences in some occupations in Alberta but negative differences (i.e., wage penalties) in others.

Within each province, the public sector wage premium tends to be positive relative to wages in the private sector, but the premium in Alberta tends to be on the low side and there is large variance when looking at differences in occupational premiums within provinces.

In sum, public sector wages in Alberta do not stand out, except that they do tend to be on small side relative to other provinces and to the private sector within the province.

That public sector workers in Alberta are “overpaid” is not supported by the data presented here. Alberta is a high wage province, and these high wages are found in both the private and public sectors. Of course, there are differences between occupations with some having larger premiums and differentials. Similarly, wage differentials within occupations compared to the other three provinces can be negative or positive. But in either case there does not appear to be any systemic overpayment of public sector workers. A limitation of this analysis has been that not all occupations are able to be compared owing to the criterion for inclusion not being met. But by definition these are occupations with few workers and so, even if these are outliers in terms of relative wages, they are unlikely to change the main findings of this analysis.

That wages throughout Alberta are high is not surprising given the rapidly expanding energy sector in the province, at least until 2014. Fortin and Lemieux (2015) and Marchand (2012, 2015) discuss the positive spillover on earnings from the resource extraction to other industries in the local economies. Marchand and Weber (2018, 470) elaborate on this:

During a boom in energy prices, greater extraction requires additional labor, thereby attracting people from elsewhere and raising earnings and income. In the presence of spillovers, greater labor demand from extraction may also affect other individuals and firms across the local economy who have no direct connection to the natural resource sector.

Similarly, Fortin and Lemieux (2015, 683) conclude:

In the case of Newfoundland, Saskatchewan and Alberta, employment in the extractive resources sector (mining, oil and gas) grew by about 50% between

1999 and 2013. The effect (due mostly to spillovers) of the extractive resources sector boom accounts for about two thirds of the divergence in the growth in mean wages between these provinces and the rest of the country.

The Alberta economy slowed beginning in 2014 and this has been reflected in earnings growth over this period compared to the preceding period. Using the Survey of Employment, Payrolls and Hours (SEPH), data complementary to the LFS used above, appears to support the proposition that there is spillover between the private and public sectors. These data show that between 2001 and 2014 nominal weekly earnings (including overtime) increased by 70 per cent in Alberta, twice that of the 35-36 per cent increases recorded in the three comparator provinces. The comparable Alberta figures for those in educational services, and health care and social assistance – the two broad industries with the majority of public sector workers and those under much of the current scrutiny of the provincial government – was about 60 per cent – compared to increases in the range of 27-55 per cent in the other jurisdictions.¹³ Alberta was – and remains – a high wage province and this is reflected in the employee compensation in both private and public sectors.

The most recent Alberta budget (Government of Alberta 2021, 17) reports that the government spends approximately half of its operating budget on employee compensation and further notes that:

In order to continue to ensure the efficient delivery of government services and that taxpayer dollars are directed to the important services that Albertans rely on, right-sizing public sector compensation is critical to achieving government's fiscal objectives.

While obviously the adjustment of employee compensation is an important component of the overall fiscal position of Alberta, there is evidence that this adjustment has already begun. Just as the labour market adjusted as expected to the expansion of the energy sector, so too is it responding to its contraction. Between 2014 to 2020, overall nominal weekly earnings in Alberta have increased by about five per cent, compared to increases of 20-22 per cent in the other three provinces. Earnings increases in the Alberta public sector have been higher in the 10-14 per cent range, but lower than the 13-21 per cent increases in the other public sector industries in Quebec, Ontario and British Columbia. While the consumer price index rose by 39.9 per cent in Alberta between 2000 and 2014, compared to a national average of 31.2 per cent, between 2014 and 2020, Alberta's inflation rate was 9.5 per cent, or about the same as the

¹³

Over this same period, nominal weekly earnings for those in public administration, the Alberta industry with the third largest number of public employees, increased by about 80 per cent. However, the majority of employees are in federal and local administration, not at the provincial level. The nominal earnings figures here are calculated from Statistics Canada, Table 14-10-0204-01. Given that the inflation rate in Alberta over this period was higher than that in the comparator provinces over this period, relative real wage increases in the provinces would be somewhat lower. See Mueller (2019b) for the number of employees in these various industries by provinces, and the proportion of public and private sector workers within each. Anecdotal evidence suggests that it is local government employees that may weigh heavily in this weekly earnings increase as municipalities were forced to compete for the services of the many skilled trades and others who could easily move to private-sector employment in the energy sector.

national average.¹⁴ Since many public sector unions have been accepting zeros or small scale increases, real wages have fallen and will likely continue to do so as the Alberta labour market continues to adjust. This is indicative of an efficient labour market as it adjusts to this (to use a common contemporary cliché) “new normal.”

¹⁴

Author's calculations using data from Statistics Canada Table 18-10-0005-01.

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Table A1: Alberta Real Wage Differentials by Sector, Relative to the Three Largest Provinces

	British Columbia				Ontario				Quebec			
	Private	All Public	Non-Admin	Provincial	Private	All Public	Non-Admin	Provincial	Private	All Public	Non-Admin	Provincial
Coefficient	0.006 **	0.011 ***	0.018 ***	0.012	0.099 ***	0.029 ***	0.028 ***	-0.021 **	0.116 ***	0.078 ***	0.074 ***	0.090 ***
SE	(0.0029)	(0.0026)	(0.0030)	(0.0093)	(0.0024)	(0.0023)	(0.0027)	(0.0095)	(0.0028)	(0.0027)	(0.0031)	(0.0101)
R2	0.5338	0.4768	0.4835	0.5085	0.5589	0.4621	0.4548	0.5231	0.5748	0.4935	0.5092	0.4856
N	81,530	71,860	56,470	4,780	141,060	127,480	98,070	6,890	102,180	98,720	74,930	7,030

Note: Author's calculations using the 2016-2018 Labour Force Survey master files. Controls for highest level of education, age and its square, landed immigrant, sex, marital status, economic family type, survey year, survey month, province, urban status, firm size, job tenure, union status, and occupation are included in all regressions. SE is the robust standard error of the coefficient estimate. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A2: Alberta Real Wages Premiums in Various Sectors Relative to the Three Largest Provinces

Rank	Occupation (NOC 2016 Code)	Coefficient Est. - AB versus BC				Coefficient Est. - AB versus ON				Coefficient Est. - AB versus QC			
		Private	Public	Non-ad.	Prov.	Private	Public	Non-ad.	Prov.	Private	Public	Non-ad.	Prov.
1	Registered Nurses and Registered Psychiatric Nurses (3012)	0.067 **	0.015 **	0.014 **		0.132 ***	0.097 ***	0.099 ***		0.078 ***	0.138 ***	0.141 ***	
2	Secondary and Elementary School Teachers and Educational Councillors (4030)		0.040 ***	0.040 ***			-0.028 ***	-0.028 ***			-0.016	-0.016	
3	Elementary School and Kindergarten Teachers (4032)		0.024 *	0.024 *			-0.015	-0.015			0.015	0.015	
4	Elementary and Secondary School Teacher Assistants (4413)		-0.148 ***	-0.148 ***			0.028 **	0.028 **			-0.043 ***	-0.043 ***	
5	Nurses Aides, Orderlies and Patient Service Associates (3413)	-0.025 **	-0.090 ***	-0.090 ***		0.075 ***	-0.042 ***	-0.042 ***		0.201 ***	0.037 ***	0.039 ***	
6	General Office Support Workers (1411)	-0.014	0.080 ***	0.105 ***		0.128 ***	0.054 ***	0.060 ***		0.181 ***	0.112 ***	0.110 ***	
7	Police Officers (Except Commissioned) (4311)		-0.060 ***				0.006				0.067 **		
8	Administrative Assistants (1241)	0.042 ***	-0.061 ***	-0.071 ***		0.103 ***	-0.017	-0.011	-0.063 *	0.072 ***	-0.009	0.004	0.139 ***
9	Secondary School Teachers (4031)		0.085 ***	0.085 ***			-0.040 ***	-0.040 ***			0.030 **	0.030 **	
10	Janitors, Caretakers and Building Superintendents (6733)	0.045 ***	0.023	0.004		0.156 ***	0.065 ***	0.053 ***		0.110 ***	0.177 ***	0.198 ***	
11	Administrative Officers (1221)	0.030 **	0.075 ***	0.065 *	0.186 ***	0.119 ***	0.023	-0.007	0.098 **	0.014	0.100 ***	0.055 ***	0.108 ***
12	Bus Drivers, Subway Operators and Other Transit Operators (7512)	0.013	0.010	0.011		0.172 ***	0.093 ***	0.098 ***		0.178 ***	0.081 ***	0.081 ***	
13	University Professors and Lecturers (4011)		0.058 **	0.058 **			-0.094 ***	-0.094 ***			-0.011	-0.011	

Rank	Occupation (NOC 2016 Code)	Coefficient Est. - AB versus BC				Coefficient Est. - AB versus ON				Coefficient Est. - AB versus QC			
		Private	Public	Non-ad.	Prov.	Private	Public	Non-ad.	Prov.	Private	Public	Non-ad.	Prov.
14	Licensed Practical Nurses (3233)	-0.014	0.051 ***	0.051 ***		0.167 ***	0.054 ***	0.054 ***		0.264 ***	0.169 ***	0.169 ***	
15	College and Vocational Instructors (4021)	-0.012	0.016	0.016		0.070 **	0.027	0.025		0.160 ***	0.084 ***	0.101 ***	
16	Social Workers (4152)	-0.023	0.042 **	0.039 **		-0.004	0.064 ***	0.057 ***		0.146 ***	0.100 ***	0.117 ***	
17	Principals and Administrators of Elementary and Secondary Education (0422)		0.120 ***	0.120 ***			0.010	0.010			0.176 ***	0.176 ***	
18	Light Duty Cleaners (6731)	-0.043 ***	-0.042 ***	-0.047 ***		0.043 ***	-0.079 ***	-0.102 ***		-0.022 **	0.007	0.006	
19	Social and Community Service Workers (4212)	-0.008	0.073 ***	0.072 ***		-0.004	0.089 ***	0.109 ***		0.063 ***	0.019	0.059 **	
20	Letter Carriers (1512)		-0.066 ***	-0.066 ***			0.036 **	0.036 **			0.014	0.014	
21	Firefighters (4312)		0.026				0.059 ***				0.245 ***		
22	Post-Secondary Teaching and Research Assistants (4012)		-0.137 ***	-0.137 ***			-0.112 ***	-0.112 ***			-0.073 **	-0.073 **	
23	Receptionists (1414)	-0.054 ***	0.015	-0.001		0.095 ***	0.039 **	0.028		0.123 ***	0.034 *	0.008	
24	Human Resources Professionals (1121)	0.032	0.010	-0.033	0.043	0.141 ***	0.091 ***	0.119 ***	0.020	0.135 ***	0.062 ***	0.150 ***	0.051
25	Medical Administrative Assistants (1243)	-0.029	0.107 ***	0.105 ***		0.137 ***	0.080 ***	0.079 ***		0.151 ***	0.173 ***	0.172 ***	
26	Financial Auditors and Accountants (1111)	0.075 ***	0.167 ***			0.075 ***	0.108 ***	0.201 ***		0.189 ***	0.195 ***	0.280 ***	
27	Accounting and Related Clerks (1431)	0.013	-0.017	0.098 *		0.106 ***	-0.036	0.106 **		0.094 ***	-0.022	0.045	
28	Managers in Health Care (0311)	0.136 ***	0.077 ***	0.077 ***		0.143 ***	0.027	0.028		0.094	-0.014	-0.014	
29	Paramedical Occupations (3234)		0.172 ***	0.148 ***			0.002	-0.013					
30	Food Counter Attendants, Kitchen Helpers and Related Support Occupations (6711)	-0.037 ***	-0.053 ***	-0.046 ***		0.029 ***	-0.049 ***	-0.053 ***		0.051 ***	0.019	0.032 **	
31	Information Systems Analysts and Consultants (2171)	-0.091 ***	0.067 ***	0.043		0.061 ***	0.099 ***	0.126 ***		0.046 ***	0.112 ***	0.096 ***	
32	Purchasing Agents and Officers (1225)	0.087 ***	0.093 ***	0.163 ***		0.136 ***	0.068 **	-0.023		0.162 ***	0.138 ***	0.111 *	
33	Family, Marriage and Other Related Counsellors (4153)	0.088 ***	0.190 ***	0.204 ***		0.060 **	0.120 ***	0.121 ***		0.142 **	0.119 ***	0.128 ***	
34	Employment Insurance, Immigration, Border Services and Revenue Officers (1228)		-0.085 ***				0.004				0.058 ***		
35	Other Assisting Occupations in Support of Health Services (3414)	-0.130 ***	0.020	0.020		0.067 ***	-0.022	-0.021		-0.009	0.168 ***	0.168 ***	
36	Heavy Equipment Operators (Except Crane) (7521)	-0.058 ***				0.139 ***	0.071 ***	0.054 **		0.126 ***	0.152 ***	0.250 ***	
37	Health Policy Resarchers, Consultants and Program Officers (4166)		0.118 ***				0.111 ***				0.104 ***		
38	Other Managers in Public Administration (0414)		-0.127 ***		-0.125 *		-0.130 ***				-0.095 ***		-0.168 ***
39	Mail, Postal and Related Workers (1511)		-0.030	-0.045 **			0.024	0.029 *			-0.058 ***	-0.061 ***	

Rank	Occupation (NOC 2016 Code)	Coefficient Est. - AB versus BC				Coefficient Est. - AB versus ON				Coefficient Est. - AB versus QC			
		Private	Public	Non-ad.	Prov.	Private	Public	Non-ad.	Prov.	Private	Public	Non-ad.	Prov.
40	Professional Occupations in Advertising, Marketing and Public Relations (1123)	0.036	0.066 **			0.092 ***	0.099 ***			0.162 ***	0.099 ***		
41	Nursing Coordinators and Supervisors (3011)		-0.022	-0.022			0.117 ***	0.118 ***			0.059 **	0.059 **	
42	Correctional Service Officers (4422)		-0.059 **		-0.114 ***		-0.031		-0.020		-0.094 ***		-0.020
43	Education Policy Resarchers, Consultants and Program Officers (4164)		0.122 ***		0.119 ***		0.083 ***		-0.035		0.185 ***		0.320 ***
44	Medical Laboratory Technicians and Pathologists' Assistants (3212)	-0.032	0.039	0.039 ***		0.244 ***	0.050	0.050			0.026	0.026	
45	Educational Counsellors (4033)		0.067	0.067			-0.001	-0.001			-0.090 ***	-0.090 ***	
46	Financial Managers (0111)	0.139 ***	0.127 ***			0.096 ***	-0.046			0.193 ***	0.140 ***		
47	Social Policy Resarchers, Consultants and Program Officers (4165)		0.060 *	0.090 **			0.057 **	0.121 ***			0.181 ***	0.143 ***	
48	Other Customer and Information Services Representatives (6552)	-0.038 **	-0.003	-0.074		0.130 ***	0.074 ***	-0.018		0.099 ***	0.078 ***	-0.024	
49	Inspectors in Public and Environmental Health and Occupational Health and Safety (2263)	-0.033	-0.016			0.141 *	0.032			0.100 ***	0.122 ***		
50	Occupational Therapists (3143)		0.037	0.037 ***			0.108 ***	0.108 ***			0.222 ***	0.223 ***	
51	Respiratory Therapists, Clinicial Perfusionists and Cardiopulmonary Technologists (3214)		0.112 ***	0.112 ***			-0.070 ***	-0.070 ***			0.342 ***	0.342 ***	
52	Power Engineers and Power Systems Operators (9241)	0.116 ***	-0.074 *	0.001		0.224 ***	-0.113	-0.133 ***	-0.089 **	0.291 ***	0.161 ***	0.173 ***	
53	Landscaping and Grounds Maintenance Labourers (8612)	0.086 ***	-0.060 *			0.208 ***	0.054 *			0.231 *			
54	Lawyers and Quebec Notaries (4112)	0.148 ***	-0.088 *			0.051	-0.063			0.108 ***	0.194 ***		
55	Urban and Land Use Planners (2153)						0.158 ***				0.109 **		
56	User Support Technicians (2282)	-0.047 *	-0.096 ***	-0.002		0.135 ***	0.049	0.064		0.171 ***	0.132 ***	0.061	
57	Medical Laboratory Technologists (3211)		0.075 ***	0.075 ***		-0.141 **	0.142 ***	0.139 ***			0.285 ***	0.285 ***	
58	Executive Assistants (1222)	-0.026	-0.098 **			-0.019	0.062 **			0.053	0.036		
59	Public Works Maintenance Labourers (7621)		0.095 ***				0.138 ***				0.199 ***		
60	Supervisors, General Office and Administration Support Workers (1211)	-0.077 *	-0.011			0.119 ***	0.081 **			0.032	0.167 ***		
61	Electrical Power Line and Cable Workers (7244)		0.232 ***	0.235 ***			0.261 ***	0.261 ***			0.218 ***	0.218 ***	
62	Dispatchers (1525)	0.028	0.132 ***			0.148 ***	0.028			0.233 ***	0.093 ***		

Rank	Occupation (NOC 2016 Code)	Coefficient Est. - AB versus BC				Coefficient Est. - AB versus ON				Coefficient Est. - AB versus QC			
		Private	Public	Non-ad.	Prov.	Private	Public	Non-ad.	Prov.	Private	Public	Non-ad.	Prov.
63	Contractors and Supervisors, Heavy Equipment Operating Crews (7302)	0.071 ***				0.134 ***	0.240 ***	0.030		0.206 ***	0.240 ***	0.248 ***	
64	Business Development Officers and Marketing Researchers and Consultants (4163)	-0.020				0.158 ***	0.256 ***			0.202 ***	0.107 ***		
65	Other Medical Technologists and Technicians (Except Dental Health) (3219)	0.081 ***	0.098 ***	0.098 ***		0.121 ***	0.082 **	0.084 ***		0.163 ***	0.171 ***	0.171 ***	
66	Psychologists (4151)						0.065	0.067			0.252 ***	0.268 ***	
67	Cooks (6322)	-0.025 **	0.094 **	-0.026		0.084 ***	-0.045 **	-0.050 **		0.060 ***	0.066 **	0.062 **	
68	Librarians (5111)		0.014	0.015			0.180 ***	0.181 ***			0.277 ***	0.279 ***	
69	Medical Radiation Technologists (3215)		0.092 ***	0.092 ***			0.042	0.042 *			0.266 ***	0.266 ***	
70	Public Works Maintenance Equipment Operators and Related Workers (7522)	0.036				0.269 ***	0.231 ***	0.239 ***		0.300 ***	0.209 ***	0.184 ***	
71	Utilities Managers (0912)		-0.100 *	-0.100 *			-0.027	-0.028					
72	Financial and Investment Analysts (1112)	-0.034	0.001			0.175 ***	-0.128 ***	-0.158 ***		0.173 ***	-0.089 **		
73	Professional Occupations in Business Management Consulting (1122)	0.069 **	0.247 ***			0.135 ***	0.210 ***			0.166 ***	0.299 ***		
74	Civil Engineers (2131)	-0.044	0.018			0.125 ***	0.028			0.170 ***	0.117 **		
75	Supervisors, Finance and Insurance Office Workers (1212)	0.110 ***				0.172 ***	0.037			0.156 ***	-0.024		
76	Physiotherapists (3142)		0.173 ***	0.173 ***			0.323 ***	0.315 ***			0.271 ***	0.263 ***	
77	Supervisors, Petroleum, Gas and Chemical Processing and Utilities (9212)	0.010				0.186 ***	0.109	0.108		0.152 **			
78	Computer and Information Systems Managers (0213)	0.107 ***				0.057 **	-0.048			0.130 ***	-0.130 ***		
79	Pharmacists (3131)	-0.033	-0.080 **	-0.080 **		0.001	0.065	0.101 *		-0.159 ***	-0.144 **	-0.116 *	
80	Early Childhood Educators and Assistants (4214)	-0.090 ***	-0.095 *			0.023	-0.013	-0.037		-0.036 **	-0.070	-0.076 *	
81	Library Assistants and Clerks (1451)		0.059 **	0.057 *			0.213 ***	0.207 ***			-0.016 ***	-0.006	
82	Specialist Physicians (3111)						-0.042	-0.041			0.025	-0.005	
83	General Practitioners and Family Physicians (3112)		-0.013	0.037			-0.056	-0.043			0.124	0.113	
84	Accounting Technicians and Bookkeepers (1311)	0.007	0.093			0.120 ***	0.295 ***			0.152 ***	0.288 ***		
85	Administrators, Post-Secondary Education and Vocational Training (0421)		0.002	0.002			0.054	0.054			-0.062	-0.062	
86	Payroll Clerks (1432)	0.066 ***	-0.039			0.158 ***	0.070 **			0.166 ***	0.002		

Rank	Occupation (NOC 2016 Code)	Coefficient Est. - AB versus BC				Coefficient Est. - AB versus ON				Coefficient Est. - AB versus QC			
		Private	Public	Non-ad.	Prov.	Private	Public	Non-ad.	Prov.	Private	Public	Non-ad.	Prov.
87	Human Resources and Recruitment Officers (1223)	0.046	-0.011			-0.043	-0.042			0.059	0.038		
88	Correspondence, Publication and Regulatory Clerks (1452)	-0.267 ***	0.059 *			-0.012	0.148 ***			-0.060	0.250 ***		
89	Database Analysts and Data Administrators (2172)	0.165 ***				0.176 ***	0.107 **			0.309 ***	0.175 ***		
90	Cleaning Supervisors (6315)	0.049	0.096			0.217 ***	-0.088 **			0.179 ***			
91	Data Entry Clerks (1422)	-0.061 *	-0.063			0.067 **	-0.055			0.214 ***			
92	Computer Developers and Interactive Media Developers (2174)	-0.042	0.281 ***			-0.057 ***	0.011			0.067 ***	0.237 ***		
93	Program Leaders and Instructors in Recreation, Sport and Fitness (5254)	-0.134 **	0.039			0.016	-0.162 ***			0.079 *	0.110 **		
94	Senior Government Managers and Officials (0112)	0.152 ***	0.143 **			-0.040	-0.048			0.090 **	-0.021		
95	Natural and Applied Science Policy Researchers, Consultants and Program Officers (4161)	0.219 ***	-0.142 ***			0.198 ***	0.001			0.355 ***	0.083		
96	Automotive Service Technicians, Truck and Bus Mechanics and Mechanical Repairs (7321)	0.026 *	0.009			0.258 ***	0.124 ***			0.306 ***	0.176 ***		
	Average (unweighted)	0.026	0.038	0.044	0.016	0.125	0.070	0.063	0.017	0.148	0.123	0.122	0.100
	Count	37	57	37	4	52	59	40	2	53	69	44	4

Notes: The top 96 occupations are comprised of Alberta public sector occupations with at least 100 unweighted observations. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Blank cells mean that there were not 100 observations for at least one of the comparator groups. The coefficients are estimated using Model 1, with separate regressions performed by occupation and sector definition. Only statistically significant estimates are included in the averages and counts at the bottom of the table.

Table A3: Real Wage Differentials, by Public Sector Definition, four largest provinces

	Alberta			British Columbia			Ontario			Quebec		
	All Public	Non-Admin	Provincial	All Public	Non-Admin	Provincial	All Public	Non-Admin	Provincial	All Public	Non-Admin	Provincial
Coefficient	0.056 ***	0.045 ***	0.004	0.065 ***	0.047 ***	0.046 ***	0.110 ***	0.097 ***	0.135 ***	0.072 ***	0.060 ***	-0.021 ***
SE	(0.0042)	(0.0046)	(0.0101)	(0.0042)	(0.0046)	(0.0088)	(0.0028)	(0.0031)	(0.0075)	(0.0034)	(0.0037)	(0.0071)
R ²	0.5642	0.5631	0.5678	0.5311	0.5258	0.5225	0.5646	0.5560	0.5713	0.5957	0.5993	0.5945
N	76,431	69,208	43,547	76,958	68,790	42,759	192,110	169,928	104,403	76,958	87,255	45,016

Note: Author's calculations using the 2016-2018 Labour Force Survey master files. Controls for highest level of education, age and its square, landed immigrant, sex, marital status, economic family type, survey year, survey month, province, urban status, firm size, job tenure, union status, and occupation are included in all regressions. SE is the robust standard error of the coefficient estimate. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A4: Public Sector Wage Premiums Compared to the Private Sector, Various Public Sector Definitions, Four Largest Provinces

Rank	Occupation (NOC 2016 Code)	Alberta			BC			Ontario			Quebec		
		All	Non-ad	Prov	All	Non-ad	Prov	All	Non-ad	Prov	All	Non-ad	Prov
1	Registered Nurses and Registered Psychiatric Nurses (3012)	0.051 **	0.050 **		0.080 ***	0.077 ***		0.098 ***	0.095 ***		-0.005	-0.011	
2	Secondary and Elementary School Teachers and Educational Councillors (4030)												
3	Elementary School and Kindergarten Teachers (4032)												
4	Elementary and Secondary School Teacher Assistants (4413)												
5	Nurses Aides, Orderlies and Patient Service Associates (3413)	-0.002	-0.002		0.063 ***	0.064 ***		0.093 ***	0.093 ***		0.106 ***	0.104 ***	
6	General Office Support Workers (1411)	0.143 ***	0.123 ***		0.027	-0.034		0.147 ***	0.116 ***		0.046	0.040	
7	Police Officers (Except Commissioned) (4311)												
8	Administrative Assistants (1241)	0.024	-0.034	-0.073	0.071 ***	0.008		0.090 ***	0.048 ***	0.011	0.030 **	-0.014	-0.060 ***
9	Secondary School Teachers (4031)												
10	Janitors, Caretakers and Building Superintendents (6733)	-0.001	-0.027		-0.049 **	-0.041 *		0.147 ***	0.141 ***		0.039 ***	0.018	
11	Administrative Officers (1221)	0.126 ***	0.050	0.278 ***	0.164 ***	0.166 ***	0.204 ***	0.125 ***	0.068 ***	0.204 ***	0.085 ***	0.053 ***	0.102 ***
12	Bus Drivers, Subway Operators and Other Transit Operators (7512)	0.116 ***	0.118 ***		0.125 ***	0.123 ***		0.205 ***	0.200 ***		0.384 ***	0.385 ***	

Rank	Occupation (NOC 2016 Code)	Alberta			BC			Ontario			Quebec		
		All	Non-ad	Prov	All	Non-ad	Prov	All	Non-ad	Prov	All	Non-ad	Prov
13	University Professors and Lecturers (4011)												
14	Licensed Practical Nurses (3233)	0.038	0.038		-0.010	-0.011		0.125 ***	0.128 ***		0.087 ***	0.087 ***	
15	College and Vocational Instructors (4021)	0.226 ***	0.207 ***		0.011	0.019		0.189 ***	0.179 ***		0.159 ***	0.158 ***	
16	Social Workers (4152)	0.106 ***	0.087 **		0.204 ***	0.222 ***		0.154 ***	0.151 ***		0.012	-0.020	
17	Principals and Administrators of Elementary and Secondary Education (0422)												
18	Light Duty Cleaners (6731)	0.037 *	0.021		0.072 ***	0.067 ***		0.168 ***	0.177 ***		0.052 ***	0.029 **	
19	Social and Community Service Workers (4212)	0.130 ***	0.138 ***		0.094 ***	0.093 ***		0.070 ***	0.077 ***		0.172 ***	0.159 ***	
20	Letter Carriers (1512)												
21	Firefighters (4312)												
22	Post-Secondary Teaching and Research Assistants (4012)												
23	Receptionists (1414)	0.057 **	0.014		-0.010	-0.029		0.116 ***	0.117 ***		0.085 ***	0.089 ***	
24	Human Resources Professionals (1121)	0.035	-0.020	-0.024	0.072 **	0.044	0.074	0.097 ***	0.055 **	0.196 ***	0.095 ***	0.063 **	0.025
25	Medical Administrative Assistants (1243)	0.109 ***	0.108 ***		0.011	0.011		0.173 ***	0.172 ***		0.073 ***	0.073 ***	
26	Financial Auditors and Accountants (1111)	0.093 ***	0.138 ***		0.128 ***			0.009	-0.092 ***		0.054 **	0.022	
27	Accounting and Related Clerks (1431)	0.212 ***	0.117 ***		0.078 ***	0.020		0.133 ***	0.081 ***		0.069 **	-0.030	
28	Managers in Health Care (0311)	-0.098 ***	-0.098 ***		0.133 ***	0.133 **		0.114 ***	0.113 ***		0.130 *	0.130 *	
29	Paramedical Occupations (3234)												
30	Food Counter Attendants, Kitchen Helpers and Related Support Occupations (6711)	0.076 ***	0.070 ***		0.125 ***	0.110 ***		0.178 ***	0.179 ***		0.125 ***	0.120 ***	
31	Information Systems Analysts and Consultants (2171)	0.084 ***	0.037		-0.004	0.007		0.026	0.014		-0.006	-0.008	
32	Purchasing Agents and Officers (1225)	0.211 ***	0.297 ***		0.195 ***	0.109 **		0.209 ***	0.131 ***		0.101 ***	-0.040	
33	Family, Marriage and Other Related Counsellors (4153)	0.087 *	0.040		-0.024	-0.036		0.154 ***	0.150 ***		-0.016	-0.019	
34	Employment Insurance, Immigration, Border Services and Revenue Officers (1228)												
35	Other Assisting Occupations in Support of Health Services (3414)	0.151 ***	0.151 ***		0.072 **	0.072 **		0.199 ***	0.199 ***		-0.225 ***	-0.225 ***	
36	Heavy Equipment Operators (Except Crane) (7521)	-0.053 ***	-0.048 ***					-0.138 ***	-0.126 ***		-0.140 ***	-0.215 ***	
37	Health Policy Researchers, Consultants and Program Officers (4166)												

Rank	Occupation (NOC 2016 Code)	Alberta			BC			Ontario			Quebec			
		All	Non-ad	Prov	All	Non-ad	Prov	All	Non-ad	Prov	All	Non-ad	Prov	
38	Other Managers in Public Administration (0414)													
39	Mail, Postal and Related Workers (1511)													
40	Professional Occupations in Advertising, Marketing and Public Relations (1123)	0.156 ***			0.109 ***			0.149 ***			0.147 ***			
41	Nursing Coordinators and Supervisors (3011)													
42	Correctional Service Officers (4422)													
43	Education Policy Researchers, Consultants and Program Officers (4164)													
44	Medical Laboratory Technicians and Pathologists' Assistants (3212)	-0.021 ***	-0.021		-0.025	-0.025		0.164 ***	0.164 ***					
45	Educational Counsellors (4033)													
46	Financial Managers (0111)	0.112 ***			0.143 ***			0.065 ***			0.129 ***			
47	Social Policy Researchers, Consultants and Program Officers (4165)													
48	Other Customer and Information Services Representatives (6552)	0.146 ***	0.234 ***		0.145 ***	0.090 **		0.198 ***	0.185 ***		0.129 ***	0.124 ***		
49	Inspectors in Public and Environmental Health and Occupational Health and Safety (2263)	0.046			0.364 ***			0.126 ***			0.126 ***			
50	Occupational Therapists (3143)													
51	Respiratory Therapists, Clinical Perfusionists and Cardiopulmonary Technologists (3214)													
52	Power Engineers and Power Systems Operators (9241)	-0.089 **	-0.065 *		-0.074 *	-0.074 *		0.179 ***	0.178 ***		0.069 *	0.055		
53	Landscaping and Grounds Maintenance Labourers (8612)	0.069			0.065			0.177 ***						
54	Lawyers and Quebec Notaries (4112)	0.052			0.272 ***			0.177 ***			-0.007			
55	Urban and Land Use Planners (2153)													
56	User Support Technicians (2282)	0.131 ***	0.213 ***		-0.052	-0.078 **		0.144 ***	0.088 ***		-0.006	-0.034		
57	Medical Laboratory Technologists (3211)	0.129 ***	0.129 ***					-0.013	-0.013					
58	Executive Assistants (1222)	0.040			0.101 ***			0.159 ***			0.163			
59	Public Works Maintenance Labourers (7621)													
60	Supervisors, General Office and Administration Support Workers (1211)	0.174 ***			0.164 ***			0.329 ***			-0.167 *			

Rank	Occupation (NOC 2016 Code)	Alberta			BC			Ontario			Quebec		
		All	Non-ad	Prov	All	Non-ad	Prov	All	Non-ad	Prov	All	Non-ad	Prov
61	Electrical Power Line and Cable Workers (7244)												
62	Dispatchers (1525)	0.246 ***			0.154 ***			0.167 ***			0.211 ***		
63	Contractors and Supervisors, Heavy Equipment Operating Crews (7302)	0.078 **	0.082 **					0.096 ***	0.120 ***		-0.010	0.013	
64	Business Development Officers and Marketing Researchers and Consultants (4163)	0.070						0.176 ***			0.254 ***		
65	Other Medical Technologists and Technicians (Except Dental Health) (3219)	0.202 ***	0.202 ***		0.151 ***	0.151 ***		0.255 ***	0.254 ***		0.008	0.008	
66	Psychologists (4151)												
67	Cooks (6322)	-0.149 ***	-0.133 ***		0.002	0.043 *		0.151 ***	0.122 ***		0.090 ***	0.076 ***	
68	Librarians (5111)												
69	Medical Radiation Technologists (3215)												
70	Public Works Maintenance Equipment Operators and Related Workers (7522)	0.017	0.033					0.120 ***	0.130 ***		0.064 **	0.084 ***	
71	Utilities Managers (0912)	0.004	0.003										
72	Financial and Investment Analysts (1112)	-0.023	-0.030		-0.112 *			0.086 ***	0.103 ***		0.146 ***		
73	Professional Occupations in Business Management Consulting (1122)	0.124 **			-0.104 ***			0.084 *			-0.010		
74	Civil Engineers (2131)	-0.159 ***			-0.081			0.049			0.038		
75	Supervisors, Finance and Insurance Office Workers (1212)	0.072 **						0.208 ***			0.209 ***		
76	Physiotherapists (3142)												
77	Supervisors, Petroleum, Gas and Chemical Processing and Utilities (9212)	-0.034	-0.034					0.231 ***	0.229 ***				
78	Computer and Information Systems Managers (0213)	-0.178 ***						0.074			0.165 ***		
79	Pharmacists (3131)	-0.029	-0.029		0.064	0.064		-0.085 *	-0.092 **		-0.031	-0.058	
80	Early Childhood Educators and Assistants (4214)	0.094 **	0.087		0.139 ***			0.167 ***	0.173 ***		0.056 ***	0.056 ***	
81	Library Assistants and Clerks (1451)												
82	Specialist Physicians (3111)												
83	General Practitioners and Family Physicians (3112)												
84	Accounting Technicians and Bookkeepers (1311)	0.141 **			-0.030			0.066 **			-0.001		

Rank	Occupation (NOC 2016 Code)	Alberta			BC			Ontario			Quebec			
		All	Non-ad	Prov	All	Non-ad	Prov	All	Non-ad	Prov	All	Non-ad	Prov	
85	Administrators, Post-Secondary Education and Vocational Training (0421)													
86	Payroll Clerks (1432)	0.161 ***			0.063 **			0.120 ***			0.216 ***			
87	Human Resources and Recruitment Officers (1223)	0.063			-0.079 **			0.114 ***			0.094 **			
88	Correspondence, Publication and Regulatory Clerks (1452)	0.133 **			0.029			0.083 **			-0.018			
89	Database Analysts and Data Administrators (2172)	0.256 ***						0.045			-0.056			
90	Cleaning Supervisors (6315)	0.207 ***			0.103			0.315 ***						
91	Data Entry Clerks (1422)	0.092 *			0.097			0.116 ***						
92	Computer Developers and Interactive Media Developers (2174)	-0.015			-0.051			-0.004			-0.047 *			
93	Program Leaders and Instructors in Recreation, Sport and Fitness (5254)	0.295 ***			0.098 ***			0.106 ***			0.098			
94	Senior Government Managers and Officials (0112)	0.097 **			0.353 ***			0.096 ***			0.211 ***			
95	Natural and Applied Science Policy Researchers, Consultants and Program Officers (4161)	0.049			0.420 ***			0.064			-0.156 **			
96	Automotive Service Technicians, Truck and Bus Mechanics and Mechanical Repairs (7321)	-0.026 **			-0.130 ***			0.063 *			0.189 ***			
	Average (unweighted)	0.095	0.101	0.278	0.109	0.080	0.204	0.138	0.117	0.200	0.093	0.075	0.021	
	Count	45	21	1	35	17	1	54	35	2	39	18	2	

Notes: The top 96 occupations are comprised of Alberta public sector occupations with at least 100 unweighted observations. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Blank cells mean that there were not 100 observations for at least one of the comparator groups. The coefficients are estimated using Model 2, with separate regressions performed by occupation and sector definition. Only statistically significant estimates are included in the averages and counts at the bottom of the table.

CHAPTER 16

A FISCAL ANCHOR FOR ALBERTA

Bev Dahlby

1. INTRODUCTION

In his Budget 2021 Address, the Honorable Travis Toews, President of Treasury Board and Minister of Finance, announced that the Government of Alberta (GOA) has adopted the following fiscal anchors:

- bringing spending in line with that of other provinces;
- keeping Alberta's net debt to GDP ratio below 30 per cent; and,
- adopting, post-pandemic, a "clear path and timeline for balancing the budget". (Budget Address 2021, 11).

In this chapter, we will evaluate the GOA's set of fiscal anchors within a general framework for evaluating the choice of fiscal anchors and then consider their application within the Alberta context.

A fiscal anchor is a policy that imposes a constraint on a government's fiscal choices affecting debt, deficits, expenditures, or interest payments. The terms "fiscal anchor" and "fiscal rules" will be used interchangeably. Why should Alberta adopt a fiscal anchor? After the economic and fiscal shocks caused by low oil prices and the pandemic, in the absence of a fiscal anchor the future direction of Alberta's fiscal policies would be highly uncertain, making private sector investment and savings decision more challenging. In addition, foreign lenders and bond rating agencies might lose confidence in the GOA's fiscal policies, especially because of the structural fiscal imbalance, thereby lowering the Alberta's credit rating and increasing interest payments on debt.¹

According to Lledó et al. (2017), 96 governments around the world have adopted fiscal rules. Why do governments adopt rules that restrict their fiscal policies? One rationale is to remove a perceived fiscal policy bias towards deficit financing, which can threaten the long-term sustainability of a government's finances. A second reason is to prevent the adoption of pro-cyclical fiscal policies that can exacerbate the economic fluctuations caused by, for example, a commodity price shock. A third rationale for a fiscal anchor in some jurisdictions is to limit the size of government to overcome a perceived political bias that leads to "excessive" spending and taxation. A fiscal anchor may help a finance minister impose fiscal discipline on spending ministries.

Since 1992, the GOA has adopted seven different sets of fiscal rules. Given that the GOA has changed its fiscal rules when they became binding or imposed difficult fiscal choices, skepticism regarding the usefulness of adopting another set of rules is warranted. However, studies have shown that fiscal rules can work.² In its overall assessment of the efficacy of fiscal anchors, Eyraud et al. (2018c) concluded that fiscal rules are "correlated with stronger fiscal positions and more stabilizing policies" (p.12) and that "even though fiscal rules are not a panacea, they can make a dent into the deficit bias depending on country circumstances and design features." (p. 16)

¹

See Eyraud et al. (2018c, 15) for a review of studies of the impact of fiscal rules on sovereign bond rates.

²

See Simpson and Wesley (2012) and Tapp (2013) on the impact of fiscal rules in Canada.

According to the IMF, fiscal rules should have the following characteristics:

- promote long-term fiscal sustainability;
- help stabilize economic activity by restricting pro-cyclical fiscal policies;
- apply to fiscal variables that are under the control of the fiscal authority;
- provide a government with reasonable options for addressing the fiscal situation when the rule is binding; and,
- be transparent so that they can be understood by the public, are not subject to manipulation or creative accounting, are coherent, and are applied to broad components of the budget.³

Above all, Eyraud et al. (2018c, 4) stresses that fiscal rules should be simple, flexible, and enforceable.

While these are all desirable characteristics, there may be tradeoffs among them. For example, simplicity may be sacrificed in adopting fiscal rules that allow a government to adjust its fiscal policies in the event of a major downturn in the economy to avoid cutting spending or raising taxes in a recession. Measures that would strengthen enforceability, such as adopting the fiscal rules in a constitution as Morton (2018) has advocated for Alberta, would limit flexibility. Establishing public support for fiscal rules and their ultimate objectives is essential for long-term compliance and adherence to the rules. Alberta's abandonment of the savings rules for Heritage Fund in the 1980s was in large part due to the lack of public acceptance and commitment to saving resource revenues. Adherence to fiscal rules may also be strengthened through institutional changes, such as the establishment of an independent fiscal council that assesses the government's fiscal performance and its adherence to the fiscal rules.

2. THE CHOICE AND CALIBRATION OF FISCAL ANCHORS

In this section we discuss three fiscal anchors that are commonly adopted by governments, but noting that governments generally adopt a combination of these anchors.

2.1 A CEILING ON A PUBLIC SECTOR DEBT RATIO

The most common fiscal anchor is a government's debt ratio, with over 70 countries adopting a ceiling on public debt. In Canada, prior to the pandemic, the federal government's fiscal anchor was maintaining a debt to GDP ratio of 30 per cent. Several issues arise in defining the debt ratio ceiling and the adjustment mechanism or rules that would be adopted if the ceiling is exceeded. One issue is whether the debt ratio is based on the government's gross debt or net debt, where net debt is gross debt minus the government's financial assets. The IMF fiscal rules data base indicates that most countries define their rule in terms of gross debt. However, as noted by the Eyraud et al. (2018c, 31) when governments have acquired financial assets that are

³

See Eyraud et al. (2018b) for a comprehensive discussion of the selection of fiscal rules.

liquid and can be sold in a timely manner at market values, net debt is an appropriate target. Conventionally, the denominator in the debt ratio is the economy's Gross Domestic Product (GDP) because GDP is generally considered a broad measure of a government's ability to raise revenues. In Section 3, we will return to the question of whether the appropriate fiscal anchor for Alberta is its debt to GDP ratio.

A third issue is the choice of the debt ratio ceiling. Internationally, most national governments' fiscal debt anchors, prior to the pandemic, were in the range of 60 to 70 per cent of GDP. For subnational governments, ceilings for debt ratios might be lower than for national governments because they lack controls over monetary policy and have more limited tax powers. In his review of Alberta's infrastructure policies, Dodge (2015) considered a debt ratio of 25 per cent of GDP for Alberta as reasonable and comparable to the debt ratios in Quebec and Ontario. However, the validity of such interprovincial comparisons of debt ratios is questionable because the Alberta economy, and by extension the GOA's revenues, are much more volatile than those of the other provinces.

If a ceiling on the debt ratio is adopted as a fiscal anchor, a numerical value for the target has to be specified. One approach to determining a debt ratio ceiling has been developed in an IMF report by Ostry et al. (2010) and is based on the notion of a government's *fiscal space*. Fiscal space is defined as the difference between a government's current debt ratio and its debt limit, where the latter is the level of debt at which a government's fiscal policy becomes unsustainable, i.e., when its projected debt ratio rises without bound and the government will eventually default on its debt. The lower the current debt ratio the greater a government's fiscal space and the lower the probability that future fiscal shocks will cause a government to default and precipitate the economic upheaval that accompanies a sovereign debt default.⁴ Using the IMF methodology for calculating fiscal space, which is based on the Canadian government's previous fiscal responses to shocks, Zandi (2019) estimates that Canada's fiscal space was about 275 percentage points of GDP in 2018. This suggests that Canada's debt ratio could increase by a substantial amount without precipitating a fiscal crisis.

Conceptually, determining the optimal debt ratio ceiling should be based on a cost-benefit analysis that considers the gain from lowering the probability of default by running budget surpluses and lowering the debt ratio against the welfare loss from the higher taxes or lower spending on public services that would be required to generate those surpluses.⁵ The cost of implementing a reduction in the debt ratio depends on how rapidly the debt ratio is brought down to the target level, and whether the fiscal adjustment is through a tax increase, a cut in a government's current spending or capital spending or some combination of these adjustments.

⁴

An econometric analysis of countries that have experienced debt crises by Furceri and Zdzienicka (2012) indicated that output declines by 10 per cent eight years after the debt crisis. See also Borensztein and Panizza (2008) on the cost of a sovereign debt default.

⁵

See Ostry, Ghosh, and Espinoza (2015) on the benefits and costs of paying down a government's debt.

In summary, the IMF's notion of fiscal space provides an analytical framework for thinking about the appropriate debt anchor. However, there are significant obstacles with its practical application in estimating the optimal debt ratio targets, given the uncertainties about the probabilities of sovereign debt default at different debt ratios, the cost of a sovereign debt default, and the forgone benefits from running fiscal surpluses.

Another issue that should be mentioned in passing is that while a debt ceiling is not meant to be a target debt ratio, in practice it could, and in many cases has, become a target with governments allowing their debt ratios to drift up to the ceiling. See Eyraud et al. (2018c, 14-15). This suggests that a rather conservative approach should be adopted in choosing the value of the ceiling for the debt ratio.

Another limitation of a debt ratio as a fiscal anchor is that a government cannot directly control either its debt level or GDP in the short run. Other fiscal rules, such as balanced budget rules or expenditure rules, must be combined with a debt ratio ceiling to specify how the government will respond to situations where the debt ceiling is violated. Below we consider the budget balance rules that could be adopted to support the implementation of a debt ratio ceiling.

2.2 BALANCED BUDGET RULES

“Balancing the budget and eliminating deficits” is an oft-stated policy objective. However, it is not clear which concept of fiscal balance proponents of “balancing the budget” have in mind. In many countries, such as Brazil and Mexico, balancing the budget means a zero primary deficit, i.e., revenues equal current and capital program spending. Interest payments on the debt are not included in the calculation of the primary deficit. In Canada, since the adoption of accrual accounting by the public sector, “balancing the budget” means balancing the operating budget, such that revenues equal current program spending, amortization of capital assets, and interest payments on debt, i.e., capital expenditures are not included in the operating deficit calculation. Finally, for some, “balancing the budget” means an overall fiscal balance such that revenues equal current and capital expenditures as well as interest payments. Each of these concepts of a balanced budget has different implications for fiscal policies and the trajectory of the public debt ratio.

2.2.1 Primary Balance

A government's primary balance determines the size of its steady state debt ratio and it is a key determinant of whether its fiscal policy is sustainable. To be more precise, a government's debt ratio will converge over time to d based on the following equation:

$$d = \frac{pb}{(1+i) \cdot (r-g)}$$

where pb is the primary balance ratio, i is the rate of inflation, r is the real (inflation-adjusted) rate of interest on the government's debt, and g is the growth rate of real GDP. This condition also implies that a government has to run a primary surplus to maintain any positive debt ratio if the real interest rate exceeds the growth rate. When r

exceeds g , a larger primary surplus is required the higher is the debt ratio in the steady state. Conversely, if the growth rate exceeds the real interest rate on the public debt, a government can maintain a given debt ratio by running a primary deficit ratio, pd , equal to:

$$pd = (1 + i) \cdot (g - r) \cdot d$$

Finally, if a government maintains a primary balance of zero, its debt ratio will increase without limits if r is greater than g , or ultimately decline to zero if g is greater than r .

Clearly, the size and sign of $(r - g)$ are critical in determining the trend in the debt ratio and whether a government has to maintain a primary surplus or can run a primary deficit to keep its debt ratio at or below some ceiling. Since World War II, growth rates in Canada have exceeded for extended periods the interest rate on Canadian government debt. The IMF data base indicates that g exceeded r for the Canadian government in 56 per cent of the years between 1945 and 2015, especially between 1945 and 1980 and since 2004.⁶ Very low interest rates in recent years have led some prominent economists, such as Olivier Blanchard and Lawrence Summers (2019), to question the wisdom of restrictive fiscal policies that limit the use of deficits to finance government spending. However, even if debt to GDP ratios decline because the interest rate on public debt is less than the growth rate of the economy, an increase in government spending financed by debt can crowd out private sector investment if the economy is operating at capacity. The cost of the deficit-financed government spending is the loss of future income-generating opportunities if government borrowing crowds out private investment.

2.2.2 Operating Balance

As previously noted, the federal and provincial governments in Canada have adopted accrual accounting as the framework for presenting their annual budgets. Accordingly, a balanced budget typically means that revenues equal current program spending, interest payments on debt, and amortization of capital assets, inventory consumption, and losses on disposals of assets.⁷ A balanced operating budget means that expenditures on public infrastructure and other capital goods are debt financed. The government's debt ratio will then depend not only on its operating balance, but also on the public sector investment rate and the amortization rate. If the amortization rate is equal to the economic rate of depreciation of the stock of public capital and if the government's investment rate maintains a constant ratio of the capital to GDP, k , the operating balance, ob , required to maintain a given debt ratio is determined by the following condition:

$$ob = g \cdot (k - d)$$

⁶ I am grateful to Paulo Mauro for providing the IMF data base.

⁷ Amortization, inventory consumption, and loss on disposal of assets are non-cash items. Amortization is meant to reflect the annual depreciation of public capital stock.

Maintaining a balanced operating budget means that the debt ratio will equal the steady state public sector capital stock ratio. If the government wants to maintain a capital stock ratio that is higher than the debt ratio, it will have to maintain an operating surplus. Alternatively, it could run an operating deficit if it maintains a capital stock ratio that is less than its target debt ratio.

In summary, a government's debt ratio under a balanced operating budget rule will depend on its investment rate and the steady state public sector capital stock ratio. A debt ratio ceiling combined with a commitment to maintain a balanced operating budget means that the public sector capital stock ratio is determined by the debt ceiling. Whether or not a given debt ratio and the implicit steady state capital stock ratio is optimal or sustainable is not apparent under a balanced operating budget rule. For this reason, the Eyraud et al. (2018c, 17) advises governments to base their fiscal rules on their overall fiscal balance rather than their operating budget balance.

2.2.3 Fiscal Balance

If a government maintains an overall fiscal balance, its revenues equal its current and capital expenditures and interest payments on its debt. Consequently, its debt in nominal terms remains constant. But in most situations nominal GDP grows because of inflation and increases in output. Therefore, a fiscal balance implies that the debt ratio declines at the rate $n/(1+n)$ where n is the rate of increase in nominal GDP. To maintain a given debt ratio, a government must run a fiscal deficit ratio, ***fd***, equal to:

$$fd = n \cdot d$$

In other words, to keep the debt ratio constant, government borrowing, as a percentage of its debt, has to equal the growth rate of nominal GDP

As noted above, adopting a ceiling on a debt ratio means that a government has to adopt a fiscal rule for reducing its debt ratio to or below the ceiling in the event of an adverse fiscal shock. Restoring fiscal balance by increasing taxes or lowering expenditures will reduce the debt ratio over time to, or below, its ceiling. However, a rapid return to fiscal balance while the economy is operating below capacity could exacerbate an economic downturn. Accordingly, fiscal rules for restoring fiscal balance are often based on the notion of a cyclically-adjusted deficit, where an adjustment is made for the impact of an economic downturn on government revenues and expenditures to avoid a pro-cyclical fiscal policy. Calibrating the fiscal balance to fluctuations in the economy is a complex technical exercise, and the experience in the EU has meant in practice that the cyclical adjustments to the fiscal balance have resulted in excessive deficits. See Eyraud (2018c, 23) The IMF also notes that governments that derive significant revenues from resource industries are particularly challenged in adopting fiscal balance adjustment rules because resource prices may not follow simple cyclical patterns, and it is difficult to distinguish temporary from permanent or long-lasting price shocks. For these reasons, the IMF advises governments to adopt an expenditure rule, rather than a cyclically-adjusted fiscal balance rule, to restore the debt ratio in the event of an adverse shock and maintain sustainable fiscal policies over time.

2.3 AN EXPENDITURE RULE

An expenditure rule could limit government expenditures as a percentage of GDP or place a ceiling on the growth rate of expenditures. For example, Brazil adopted a constitutional amendment in 2016 that limits the increase in the federal government's primary expenditures, net of transfers to the states and municipalities, to the rate of inflation over the previous year. Obviously, this ceiling was violated in 2020 because the government had to implement a basic transfer payment to shelter the poor from a steep income decline caused by COVID-19. The Brazilian experience shows that the expenditure growth rate ceiling should be based on a moving average for a recent period to avoid procyclical increases or decreases in the expenditure ceiling. There should also be some well-defined "escape" clauses or mechanisms. The range of expenditures to be covered by the ceiling should be broad, covering those that the government can control, at least in the medium term, and not closely associated with economic fluctuations. These considerations suggest that the expenditure ceiling should apply to most current and capital expenditures, but not include interest payments on debt or transfer programs such as unemployment insurance or social assistance payments that have a cyclical component.

3. A FISCAL ANCHOR FOR ALBERTA

Given this general background on fiscal anchors and fiscal rules, we now consider Alberta's recently adopted fiscal anchor. It should be said, at the outset, that establishing a fiscal anchor for Alberta is challenging because of the economy's volatility and the consequent fluctuations in provincial government revenues. Given that GOA had a structural fiscal imbalance heading into the pandemic and that it incurred large deficits in 2020-21 because of revenue reductions and implementing programs to shelter Albertans from severe hardship during pandemic, setting and then sticking to a new fiscal anchor will be especially challenging.

In Budget 2021 the GOA announced the adoption of the following fiscal anchors:

- bringing spending in line with that of other provinces;
- keeping Alberta's net debt to GDP ratio below 30 per cent; and,
- adopting, after the economy has recovered from the pandemic downturn, a timetable for balancing the budget.

We will discuss each of these components of the government's fiscal anchor strategy and then recommend an alternative set of fiscal rules.

In justifying the expenditure anchor, the Minister of Finance referred to the Blue Ribbon Panel Report which found that "Alberta has spent more per capita than comparable provinces without achieving better outcomes." (Budget 2021, 11). In particular, the Blue Ribbon Panel Report (2019, 26) found that Alberta's per capita expenditures in 2017 of \$13,819 exceeded those of the comparator provinces, British Columbia at \$10,285, Ontario \$10,281, and Quebec \$13,539. Lowering Alberta's per capita spending to the average of the three comparator provinces in 2017 would have required a \$10.4 billion reduction in spending.

As is well known, tax rates in Alberta are significantly lower than in other provinces. Budget 2021 reported that if Alberta imposed the same tax rates as British Columbia, it would raise an additional \$14.3 billion in 2021-22. With Ontario's tax structure, Alberta would raise an additional \$13.3 billion. With Quebec's, Alberta would raise an additional \$19.5 billion. While these calculations indicate that Alberta could address its structural deficit by raising taxes, about 60 per cent of Alberta's tax gap with the comparator provinces is due to the absence of a provincial sales tax. A recent public opinion survey indicated that over 60 per cent of the respondents were opposed to the introduction of a provincial sales tax. See Thomas (2021). Therefore, it not surprising that the government has focused on expenditure restraint for eliminating its structural deficit. Whether expenditure restraint will achieve this result, once pandemic-related spending has been wound down, is yet to be determined. The goal of lowering per capita spending to the average of the comparator provinces should be regarded as a medium term target. If successful, it should be replaced by another fiscal anchor for expenditures. This will be described in greater detail later in this section.

The GOA's second fiscal anchor is a 30 per cent ceiling on its net debt to GDP ratio. We will begin by discussing whether this is an appropriate way of defining a debt ratio for the province, and then we will consider whether the 30 per cent figure is appropriate.

First, although the debt ratios are normally based on a government's gross debt, the IMF acknowledges that when governments have acquired financial assets that are liquid and can be sold in a timely manner at market values, net debt is a more appropriate target. Accordingly, net debt is an appropriate target for Alberta, given that financial assets that are held in the Alberta Heritage Savings Trust Fund and in other government funds are regularly reported based on their market values.

Second, while it is conventional to measure public sector debt relative to GDP, McMillan (2019, 17-22) has argued that a debt to GDP ratio is not appropriate for Alberta because the composition of Alberta's GDP is substantially different from other provinces. The Alberta economy is much more capital intensive, and gross capital formation is a much larger component of Alberta's GDP. Private sector investment (as opposed to the business profits and wages and salaries that it generates) is not part of the GOA's tax base. McMillan argues that in the Alberta context a more appropriate metric for measuring the provincial debt burden is the ratio of the net debt to provincial government revenues. A related alternative debt anchor, the ratio of interest payments to revenues, has been proposed by Dodge (2020) for the federal government. Below, we will consider a debt service to revenue ratio as an alternative way of defining the fiscal anchor.

We can now briefly consider how the 30 per cent net debt ceiling could constrain the Alberta government's fiscal policies. Budget 2021 indicates that the government expects that net debt to GDP ratio to increase from 13 per cent in 2019-20 to 25 per cent in 2023-24. We consider the following scenario for fiscal policy after 2023-24 to illustrate the fiscal restraint that the government would have to exercise to maintain the net debt ratio at 25 per cent. Budget 2021 projects that nominal GDP growth rate will decline from 8.8 per cent in 2021 to 6.8 per cent in 2024. Accordingly, we optimistically assume a growth rate of 6.0 per cent in 2025 and then 5.0 per cent in the following

years.⁸ The green line in Figure 1 shows our estimates of the fiscal deficits for the 2021 to 2024 period based on the Budget 2021's projected increases in the Alberta's net debt. (To be clear, we are showing the estimated fiscal deficits, not the government's budget deficits.) The fiscal deficits decrease from \$22.3 billion in 2020-21 to \$8.0 billion in 2023-24, when the net debt to GDP ratio reaches 25 per cent. The blue line shows the fiscal deficits that would be consistent with maintaining a net debt to GDP ratio of 25 per cent assuming nominal GDP growth rates of 6.0 per cent in 2025 and 5.0 per cent thereafter. This scenario shows that the government would have to reduce its fiscal deficit to \$6.1 billion in 2024-2025 and to \$5.4 billion in 2025-26 before allowing it to slowly increase. Consistent with the model in Section 2.2.3, fiscal deficits along this path would equal 1.25 per cent of nominal GDP.⁹ This fiscal deficit ratio is sufficient to keep the net debt ratio at 25 per cent given a nominal GDP growth rate of 5.0 per cent.

This scenario illustrates two points. First, maintaining the debt ratio below the 30 per cent ceiling seems feasible if the nominal GDP grows at the projected 5.0 per cent rate and the government carries through with its fiscal plan to 2023-24. Second, a series of economic shocks that adversely affect provincial revenues could drive the debt ratio to the ceiling and beyond. Economic models provide little guidance on whether the 30 per cent ceiling is "optimal" and would provide an adequate safety margin for preventing a serious debt crisis during an economic downturn. Simulations with random shocks to Alberta's GDP and the provincial government revenues might help to gauge the probability that a 30 per cent ceiling would be breached if the government tried to maintain fiscal deficits consistent with a 25 per cent net debt ratio.

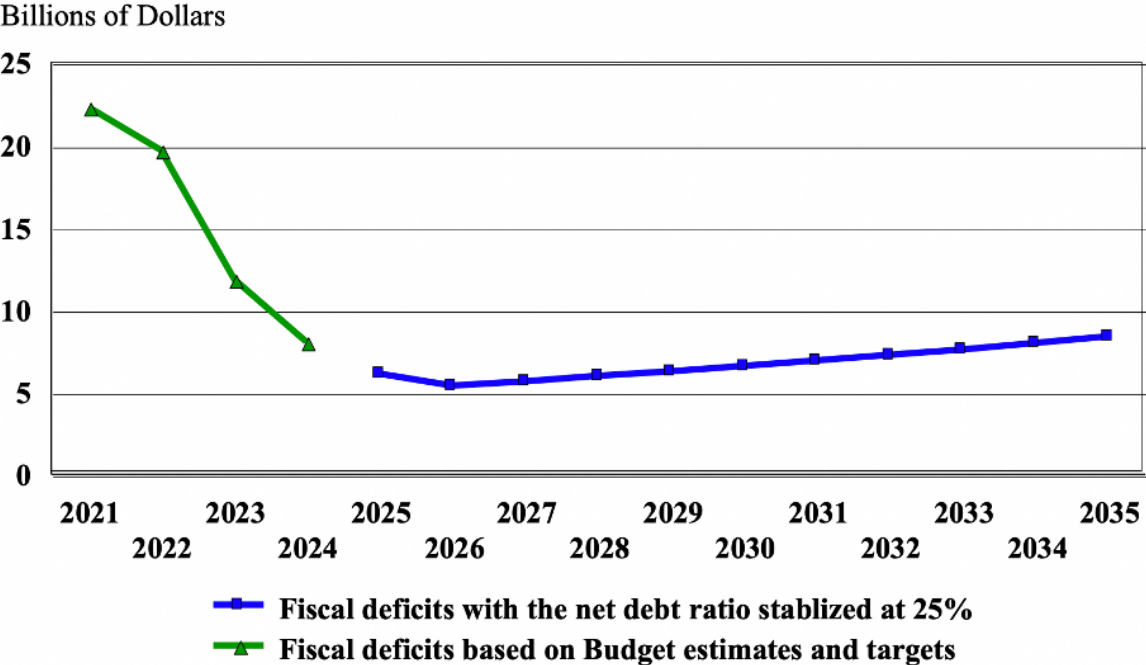
⁸

Assuming a 2.0 per cent inflation rate and a 1.4 per cent population growth rate, a 5.0 growth rate for nominal GDP implies a productivity growth rate of about 1.6 per cent.

⁹

In the spread sheet calculations used to generate the fiscal deficits, the ratio is $0.25 * (0.05 / (1 + 0.05)) = 0.0119$ because of a lag between the calculated deficit and the nominal GDP estimate used to calculate the ratio.

Figure 1 Fiscal Deficits Under a 25 Per cent Net Debt Ratio



As previously noted, gauging the size of Alberta’s debt relative to GDP has been critiqued by McMillan (2019) who has argued that a more appropriate measure is the ratio of debt to provincial government revenues. Dodge (2020) has proposed a similar approach to establishing a fiscal anchor for the federal government. He has advised the federal government to conduct its fiscal policy to keep the ratio interest payments on debt to government revenues below 10 per cent. Based on the GOA Budget 2021 estimates and targets, the ratio of interest payment to revenues is set to increase from 4.8 per cent in 2019-20 to 6.6 per cent in 2023-24, and therefore remain well below the Dodge threshold. As with the debt ratios, economic modelling provides little guidance in setting a ceiling on the interest payment ratio and policy makers rely on comparisons with other jurisdictions for guidance. At the international level, the average interest payment ratio is around 3.3 per cent for advanced economies, but over 10 per cent for emerging economies, such as India, South Africa, Mexico, and Brazil. See Wheatley (2021).

There are other concerns about using an interest payment ratio as a fiscal anchor, especially in the Alberta context. One is that the GOA’s revenues fluctuate from year to year, which could result in wide swings in the ratio of interest payments to revenues. Potentially, revenue fluctuations could push the ratio above some ceiling, such as 10 per cent. A natural policy response to a prolonged breach in the ceiling would be to increase the denominator in the ratio, i.e., revenues, because the numerator, interest payments, are largely beyond the control of a government in the short to medium term. An interest payment ratio rule would bias fiscal policy adjustments in favour of tax increases, rather than expenditure restraint. For these reasons, an interest payment ceiling is not an appropriate fiscal anchor for most governments, and it is especially unsuited in the Alberta context.

The third strand of the Alberta's announced fiscal anchor is balancing the budget. As noted in Section 2.2.2, if a government maintains a balanced budget its debt ratio is determined by its investment ratio and ultimately the debt ratio will approach the public sector's capital stock ratio. A balanced budget does not mean that the government's debt is manageable or even sustainable. In keeping with the IMF's advice, the GOA should not use budget balances as part of its suite of fiscal anchors. The rule should be based on the government's fiscal balance, such as maintaining a fiscal deficit ratio that is needed to achieve a given debt ratio over time. However, as previously noted, it is difficult to specify a fiscal rule that avoids destabilizing pro-cyclical fiscal adjustments.

An alternative would be to supplement the debt ratio rule with an expenditure rule. There are different ways of setting an expenditure rule. Limiting spending increases to the growth rate of GDP, or population and inflation, are possible candidates. The Blue Ribbon Panel (2019, 68) considered these alternatives and recommended that "the provincial government adopt a fiscal rule that limits the annual increase in total program spending to the projected rate of increase in total household incomes in Alberta." Blue Ribbon Panel (2019, Recommendation 21, 68). It noted that:

This type of fiscal rule... is based on a fiscal variable that the government can control—its program expenditures. It is a limitation on what the government can spend. The government always has the option of spending less than the permitted increase. It is a simple rule that applies to a key fiscal variable, total program expenditures. And it would prevent Alberta from repeating its past history of ratcheting up spending when resource revenues are high. It also says to taxpayers that when their household incomes go up, it's reasonable and responsible for government spending to increase at about the same rate.

The GOA should reconsider its set of fiscal rules by adopting an expenditure rule that limits the increase in capital and operating expenditures to a moving average rate of increase in household primary incomes in Alberta.¹⁰

4. RECOMMENDATIONS

Based on the above analysis, we recommend that the GOA:

- supplement the debt ratio anchor with an operational fiscal rule that limits the increase in total expenditures to a moving average of the increase in household primary income in Alberta;
- report its primary balance and fiscal balance along with the budget balance in its quarterly updates and annual budget;
- conduct every four years a review of the sustainability of its fiscal policies; and
- re-evaluate and re-calibrate its fiscal anchor and other fiscal rules based on the results of the fiscal sustainability review.

¹⁰

By way of a full disclosure, the author was a member of the Blue Ribbon Panel.

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CHAPTER 17

FISCAL PLANNING AND SUSTAINABILITY IN ALBERTA

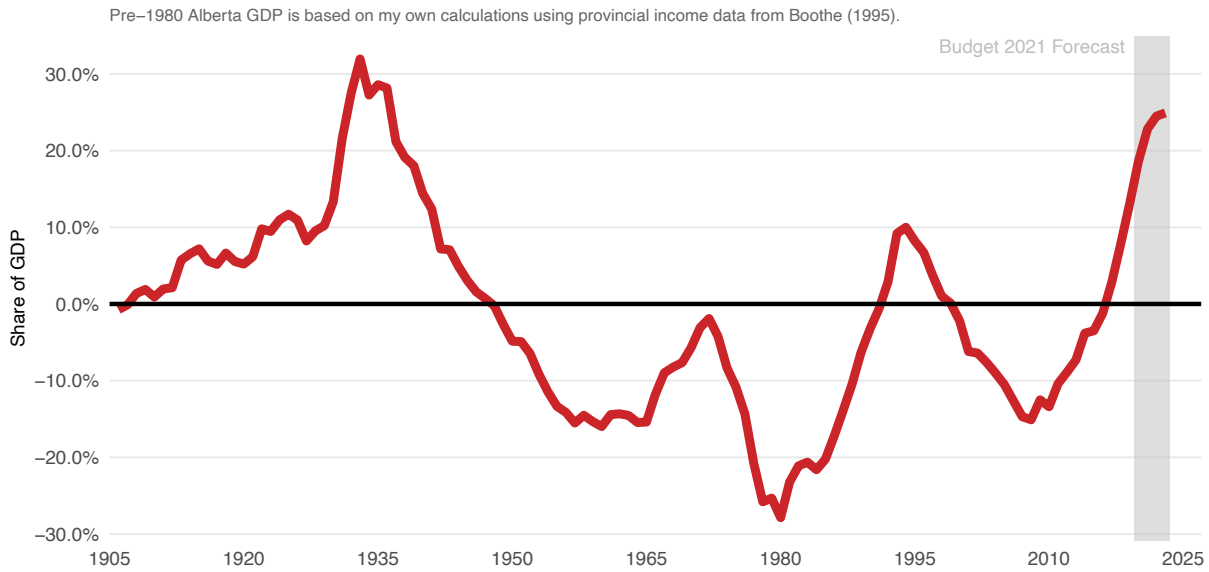
Trevor Tombe

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

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

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

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



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



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

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

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

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

PLANNING FOR SUSTAINABLE FISCAL POLICY

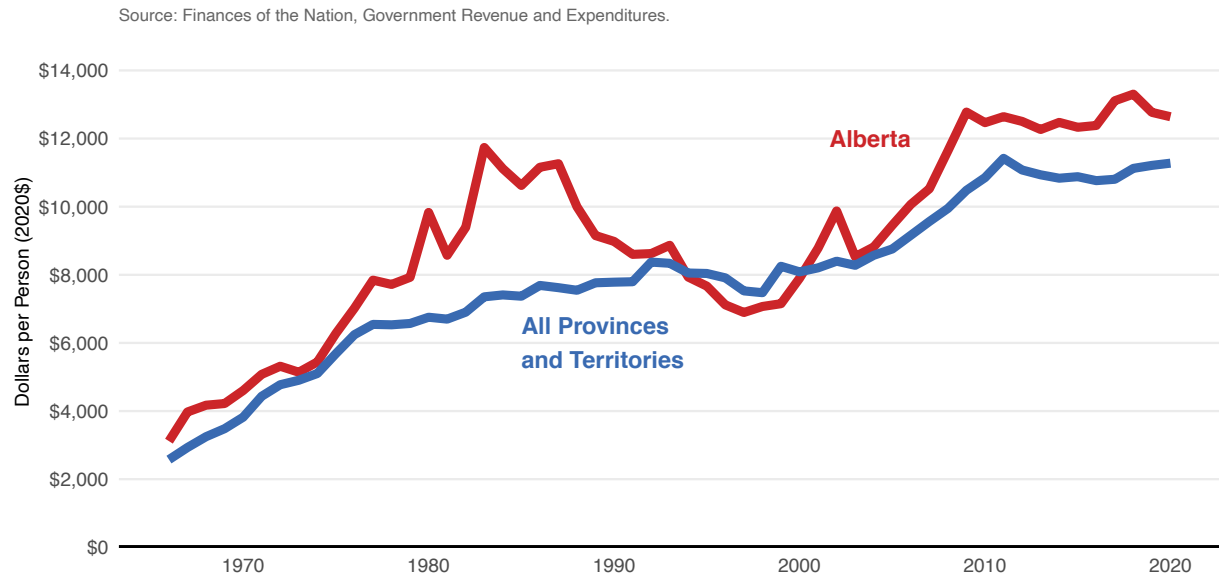
Public debt cannot indefinitely grow faster than the overall economy. This simple statement is the core of analysis investigating whether a government's finances are sustainable. More concretely, fiscal sustainability analysis asks whether a jurisdiction's debt to GDP ratio is bounded – as opposed to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

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

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

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

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



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

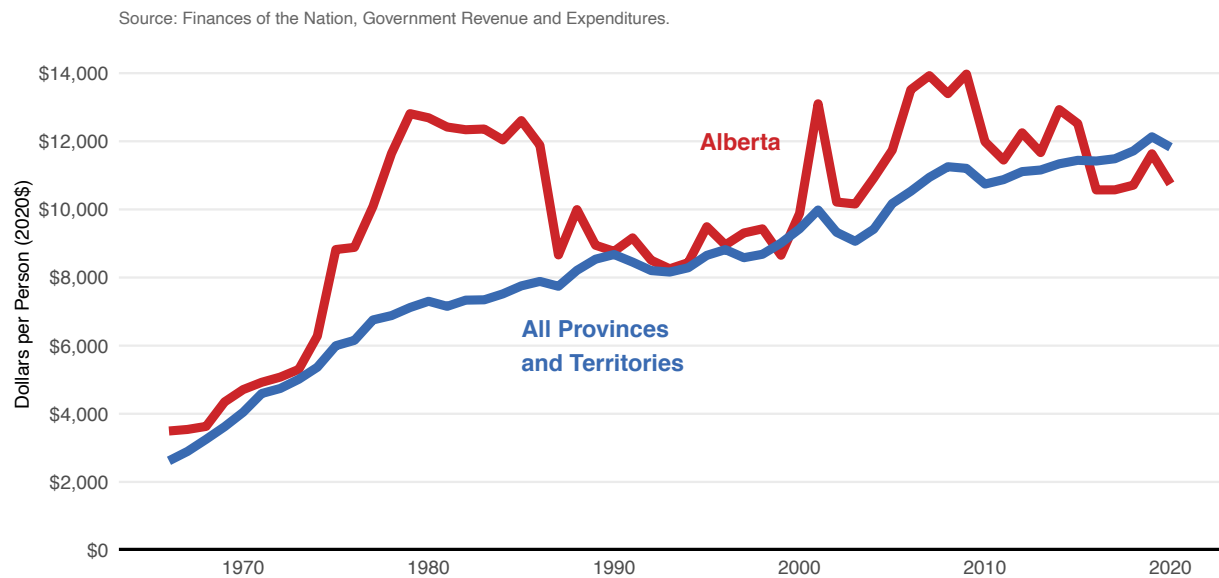


Table 1: Status-Quo Budget Projections for Alberta (Percent of GDP per Year)

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

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

Building on this intuition, one simple way to understand the long-run fiscal situation of a government is to construct something akin to a multi-year budget. We must take care, however, to appropriately compare financial magnitudes across long spans of time to average them together in a simple summary statistic. To that end, I express all units in terms of shares of Alberta’s GDP and discount future values to the present using an effective discount rate $\varphi_T = \prod_{t=1}^T (1 + r_t) / (1 + g_t)$, which is the product from today ($t = 1$) to some future year ($t = T$) of interest rates r_t and economic growth rates g_t .⁷ This way of discounting recognizes both the time value of money (through the interest rate) and changes in the economy’s total income (through the economic growth). If interest rates are higher or if economic growth rates are lower, then future values are discounted more heavily. A spending initiative worth 10 percent of GDP ten years from now, for example, is equivalent to $10 \times \varphi_{10}$ today. With this discount rate, it is straightforward to take future projections for revenues and expenditures and construct budget estimates over the next 10 years, 25 years, 50 years, or more. I report the results of this exercise in Table 1, with all values expressed as average shares of GDP per year.

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

⁷ It doesn’t matter whether interest rates and growth rates are expressed in nominal or real (inflation-adjusted) terms, so long as they are either both real or both nominal.

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

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

HEALTHCARE EXPENDITURE GROWTH

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

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

ECONOMIC GROWTH AND REVENUE FROM TAXATION

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

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

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

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

REVENUES FROM NATURAL RESOURCES

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

²

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

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

PLANNING FOR ALBERTA’S FISCAL RISKS

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

VOLATILITY IN THE PRIMARY BUDGET BALANCE

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

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

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

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

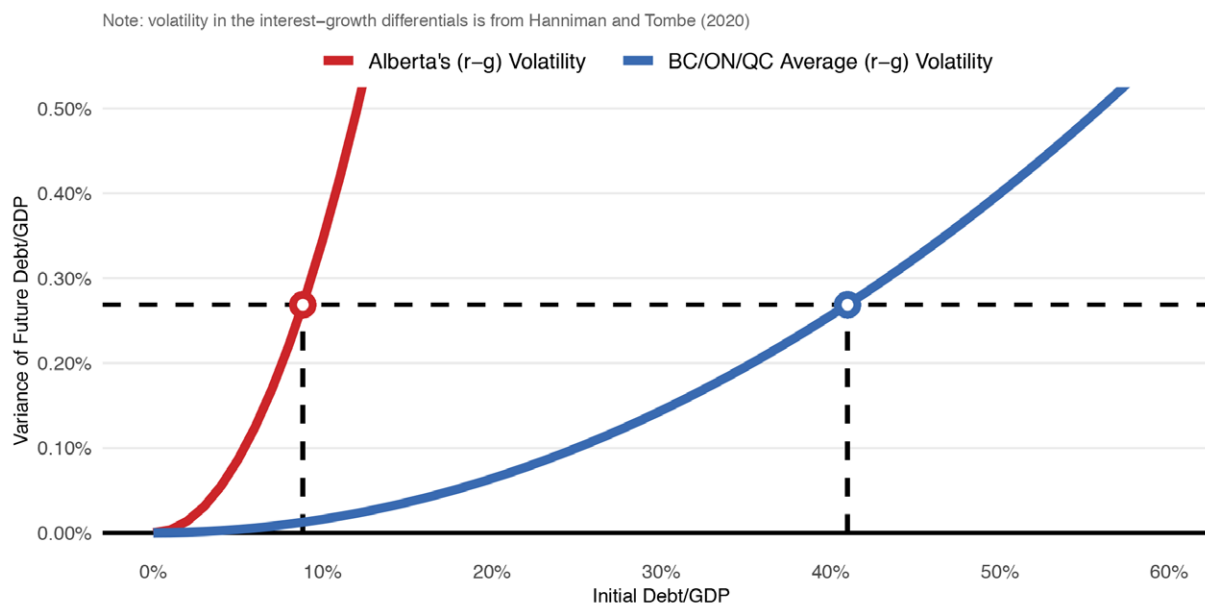
VOLATILITY IN ECONOMIC FUNDAMENTALS

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

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

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

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



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

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

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

PLANNING FOR A ROBUST FISCAL FUTURE IN ALBERTA

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

³

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

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CHAPTER 18

REVENUE OPTIONS TO CLOSE THE FISCAL GAP IN ALBERTA: PICK YOUR POISON

Daria Crisan and Kenneth J. McKenzie

INTRODUCTION

In this paper we examine government revenue options for Alberta in light of the “twin crises” precipitated by the COVID-19 pandemic and changes in the market for fossil fuels. The pandemic has dealt a historic blow to economies worldwide. Alberta is no exception. However, as we emerge from the pandemic, and converge to an uncertain “new normal”, Alberta faces additional challenges. The energy sector, which has been the backbone of Alberta’s economy for decades, was under pressure prior to the pandemic. While the sector will no doubt be subject to the “fits and starts” going forward that Albertans are well used to, this underlying pressure is unlikely to ease as Canada implements policies to meet its environmental obligations under the Paris Agreement by 2030 and the more ambitious “net zero” objective by 2050. Related to this is the decline in the growth of the demand for fossil fuels that will inevitably accompany similar obligations on an international level. And all of this is layered on top of uncertain technological developments in fossil fuels, carbon abatement and renewables going forward.

It thus seems clear that the Alberta of the future will differ from the Alberta of the past. While the precise pathway and speed of these changes are uncertain, they are inevitable in the broad strokes. And there is little doubt that they have important implications for Alberta’s economy and for its underlying fiscal framework. In this paper we focus primarily on the revenue side of the fiscal equation. However, it is important to consider Alberta’s revenue system within the broader fiscal context.

We anchor our discussion to the notion of fiscal sustainability. As explained by Trevor Tombe in his contribution to this volume,¹ the fiscal gap is a measure of fiscal sustainability based on the path of the debt/GDP ratio. A fiscal configuration that results in a rising debt/GDP ratio over time is said to be fiscally unsustainable. The fiscal gap measures the difference between revenues and program expenditures as a percentage of GDP required to maintain a stable debt/GDP ratio over a given period. The fiscal gap is therefore a forward-looking concept, reflecting projected future program expenditures and revenues under the current configuration as determined by underlying assumptions regarding population growth, demographics (aging), labour productivity, interest rates, inflation, etc. It is important to emphasize that the fiscal gap is a dynamic concept, and therefore differs from the deficit which is measured at a point in time.

Over a 10-year period Tombe calculates Alberta’s fiscal gap to be about 4.2 percentage points of GDP, which is the second highest in the country.² Using the nominal GDP forecast in the 2021 budget this is equivalent to about \$15.1 billion in 2022. This means

¹

Tombe (2021), which is an extension of Tombe (2020).

²

Behind Newfoundland and Labrador. Tombe’s calculations of the fiscal gap measured over longer time periods are similar: 4.0% for 25 years, 4.3% for 50 and 75 years, 4.1% for 100 years. It should be noted that the Parliamentary Budget Officer (PBO) calculates Alberta’s fiscal gap to be significantly lower, at 2.1 per cent (https://www.pbo-dpb.gc.ca/web/default/files/Documents/Reports/RP-2021-033-S/RP-2021-033-S_en.pdf). As explained by Tombe (2020), the difference is because he considers various revenue streams individually on a disaggregated basis, while the PBO aggregates own-source revenue and assumes that it simply grows with GDP. Tombe also includes capital expenditures, while the PBO does not. For these reasons we think that the Tombe number is a more accurate depiction of Alberta’s fiscal situation.

that Alberta's finances are not sustainable under the current configuration of taxes and expenditures, and the debt/GDP ratio is projected to rise over this period. Any combination of an increase in revenues or decrease in program expenditures, as a percentage of GDP, that add to 4.2 percentage points is required to close the fiscal gap and put the province on a fiscally sustainable track by this definition.

The debate surrounding the sustainability of the province's finances is sometimes framed in terms of whether Alberta has a "revenue problem" or a "spending problem". This is a false dichotomy. Alberta has a "sustainability problem", one which can be addressed by working on either side of the budget, or both. While choosing how to address this problem may involve difficult economic and political decisions, with the inevitable trade-offs, the underlying math is simple and inescapable. And choose we must.

We therefore discipline our analysis by considering policy configurations that will, by our calculations, roughly eliminate the fiscal gap over a ten-year period. This is the dynamic equivalent to a revenue neutral or balanced budget analysis of changes to public finances. By constraining our analysis in this way, three idioms inform our discussion throughout: "there is no such thing as a free lunch", the province must "follow the money" and "pick its poison".

Having said this, we do not take a strong stand on whether completely closing the fiscal gap is indeed optimal from a welfare perspective. In a low interest rate environment this is in fact an open question.³ Rather, the approach taken here is to discipline the analysis so as to compare "apples to apples" in various scenarios that close the fiscal gap. To the extent that policies aimed at reducing, but not closing, the fiscal gap are adopted the numbers presented below can be scaled accordingly.

We argue that while Alberta's current fiscal configuration is not sustainable, and is in need of an overhaul, it is not as bad as may be thought. The reason for this is that the province has access to policy levers on both sides of the ledger, and in particular to some untapped revenue sources, that can be used to move the province's finances to fiscal sustainability. We present some alternatives below that, while recognizing that some difficult choices need to be made, retain at least some aspects of the "Alberta Advantage" in fiscal policy that the province has enjoyed in the past. And, yes, to address the elephant in the room at the outset, in our view this should include a provincial sales tax harmonized with the GST.

But to see where we need to go, we need to know where we have been and where we are at.

WHERE WE HAVE BEEN

Figures 1 through 5 provide a glimpse of Alberta's fiscal situation over four and half decades. Looking first at provincial program expenditures⁴, Figure 1 shows real per capita program spending in Alberta compared to the rest of Canada (ROC), excluding

³

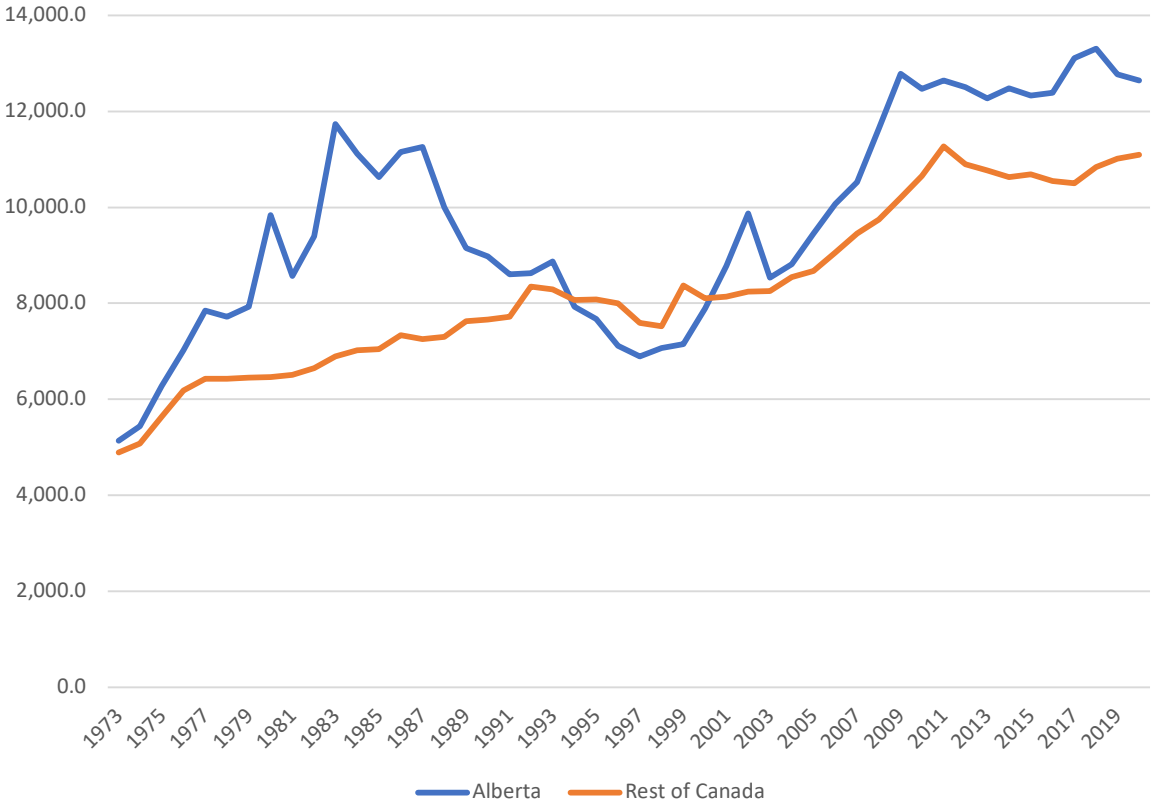
See, for example, Blanchard (2019).

⁴

Program expenditures exclude interest payments on government debt.

Alberta.⁵ It is evident that throughout much of the period per capita expenditures in Alberta have been higher than the rest of the country. The exception is the period between 1994 and 2000, when real per capita expenditures were reduced significantly under the “Klein Revolution”. In 2020, per capita expenditures in Alberta were almost 14 per cent higher than the rest of Canada. It is fair to say that this difference in per capita spending between Alberta and the rest of Canada is the source of the claim that Alberta has a “spending problem.” For example, many of the recommendations contained in the 2019 report of Blue Ribbon Panel on Alberta’s Finances (the “MacKinnon Report”) are justified on the basis of per capita spending in Alberta being out of line with other provinces on several dimensions.⁶

Figure 1: Real Per Capita Program Expenditures, Alberta and the Rest of Canada



Source: Finances of the Nation Government Finances Database at <https://financesofthenation.ca/>. Rest of Canada does not include Alberta.

Notes: 2012 dollars.

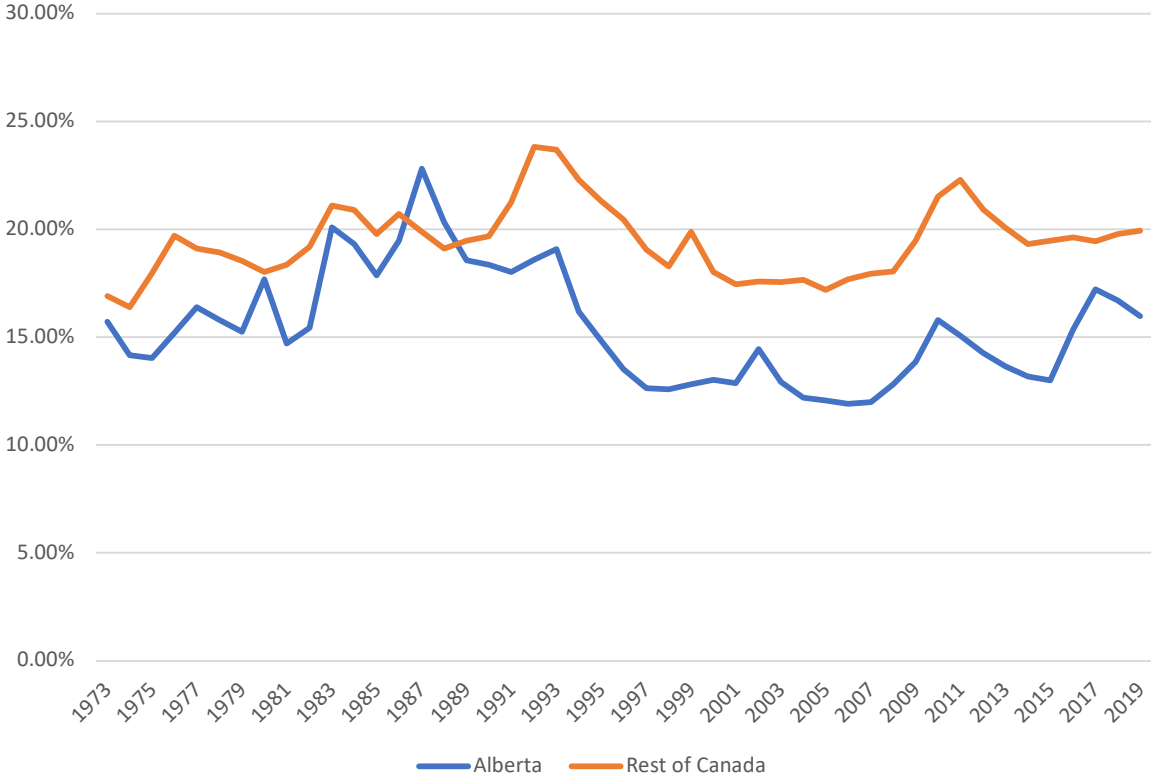
Expressing program spending relative to GDP in Figure 2 tells a different story. Here we see that spending as a percentage of GDP has typically been lower in Alberta than the rest of Canada, most particularly from the mid-90’s on. This is due in large part to the large role that the oil and gas sector plays in the Alberta economy relative to the rest of

⁵ Rather than using the “Rest of Canada” as a comparator the large provinces of Ontario, B.C. and Quebec are sometimes employed (e.g., in the MacKinnon Report). This does not make a substantial difference as the per capita figures for the “Rest of Canada” are dominated by the three largest provinces.

⁶ Blue Ribbon Panel (2019).

the country, which increases per capita GDP in Alberta significantly. As the anticipated decline in the relative importance of the oil and gas sector in the province's economy takes hold over the next several decades, this is expected to moderate.

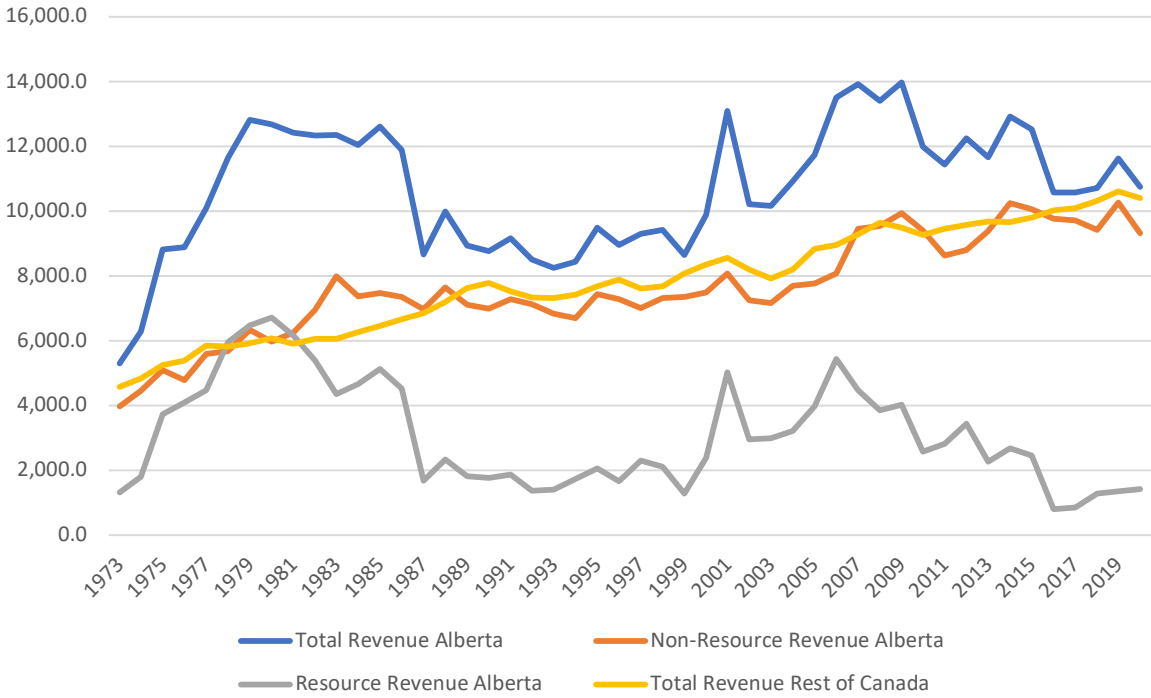
Figure 2: Program Expenditures as a Per Cent of GDP, Alberta and the Rest of Canada



Source: Finances of the Nation Government Finances Database at <https://financesofthenation.ca/>. Rest of Canada does not include Alberta.

Turning to revenue, Figure 3 shows real per capita revenue in Alberta versus the rest of Canada. For Alberta we show total revenue, non-resource revenue, and resource revenue separately. Several things are evident from the figure. In terms of total revenue, Alberta's real per capita revenue has exceeded the average of the rest of the country throughout the period. This, of course, is because of resource revenue. Note, however, that in 2020 Alberta was very close to the rest of the country. Per capita non-resource revenue in Alberta has been closer to the rest of Canada but has tended on the whole to be slightly lower. Also evident from the figure is the high degree of volatility in total and resource revenue in Alberta, and the precipitous decline starting in 2006.

Figure 3: Real Per Capita Revenue, Alberta and the Rest of Canada

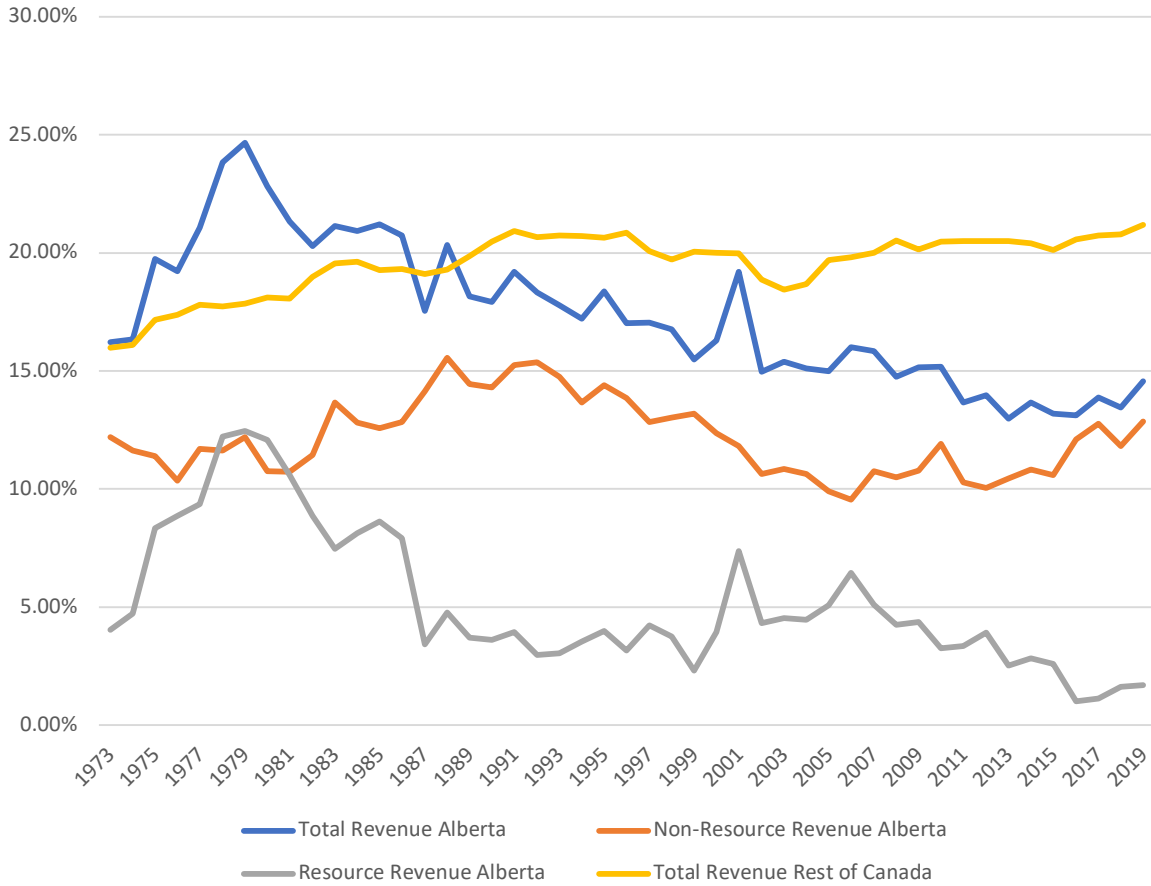


Source: Finances of the Nation Government Finances Database at <https://financesofthenation.ca/>. Rest of Canada does not include Alberta.

Notes: 2012 dollars.

Again, expressing revenue as a share of GDP in Figure 4 tells a different story. Here we see that since 1990 Alberta’s total revenue as a percentage of GDP has been lower than the rest of Canada, and has fallen significantly in the 2000’s. This is due in large part to drop in resource revenue, as non-resource revenue has remained relatively stable as a share of GDP.

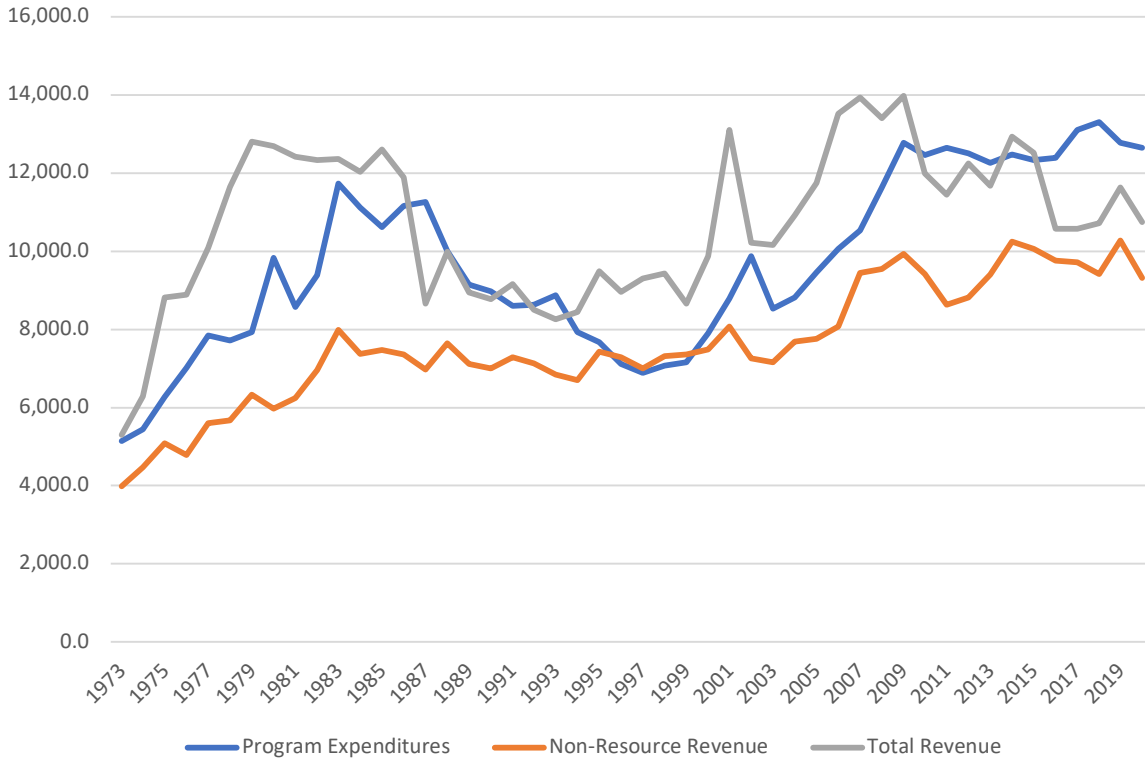
Figure 4: Revenue as a Per Cent of GDP, Alberta and the Rest of Canada



Source: Finances of the Nation Government Finances Database at <https://financesofthenation.ca/>. Rest of Canada does not include Alberta.

Finally, Figure 5 shows program expenditures together with total and non-resource revenue in Alberta in real per capita terms. This, in a nutshell, illustrates the essence of the so-called “Alberta Advantage”. For much of the last 45 years government spending in the province has somewhat closely tracked total revenue on a per capita basis, but been significantly higher than non-resource revenue, the exception being the Klein years from 1995-2000. As such, Albertans have been able to enjoy relatively high per capita program spending without having to pay for it through higher (non-resource) taxes. The reason, of course, is resource revenue. This has resulted in a sort of “fiscal illusion”, whereby Albertans don’t “see” the full cost of government goods and services reflected in their taxes, with resource revenue paying some of the freight.

Figure 5: Real Per Capita Program Expenditures and Revenue, Alberta



Source: Finances of the Nation Government Finances Database at <https://financesofthenation.ca/>. Rest of Canada does not include Alberta.

Notes: 2012 dollars.

This is changing. In response to the release of the MacKinnon Report Alberta Finance Minister Travis Towes opined, “We can no longer spend like we’re the rich kids on the block because, quite frankly, we’re not anymore.”⁷ The flip side is that we can no longer tax like we’re the rich kid on the block. The money generated from our “trust fund” (our endowment of natural resources) is being squeezed. It is time for the rich kids to cut the apron strings and face the “real world”.

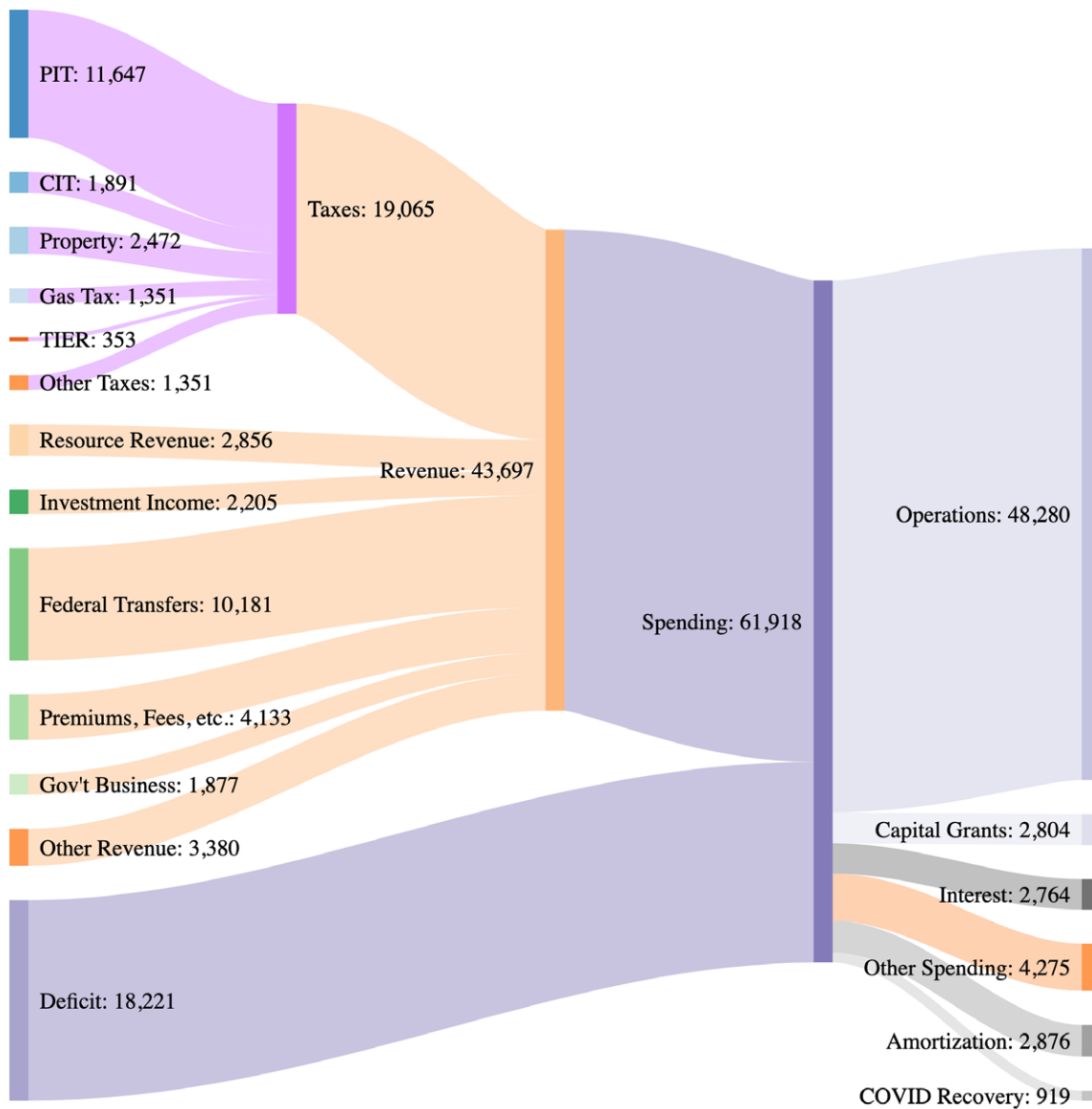
WHERE WE ARE AT

Before turning to a discussion of revenue options going forward, we briefly discuss the current financial status of the province.

Figure 6 presents the estimated financial flows for 2021/22 from the most recent Alberta budget. Total spending, including capital spending, is estimated to be about \$61.9 billion, financed by total revenue of \$43.7 billion and a deficit of \$18.2 billion.

⁷ <https://www.thestar.com/business/2019/09/04/no-longer-the-rich-kids-on-the-block-alberta-finance-minister-sells-restraint.html>

Figure 6: Government of Alberta Estimated Financial Flows 2021/22



Source: Government of Alberta Budget 2021, *Fiscal Plan: Protecting Lives and Livelihoods*. Created with Sankeymatic.com.

On the revenue side, which is the focus of our analysis, we see that taxes in aggregate are estimated to generate a little over \$19.0 billion, or 43.6 per cent of total revenue. Looking at tax revenue, personal income taxes are by far the single biggest source of revenue, accounting for 26.6 per cent of total revenue, followed by property taxes (5.7 per cent) and corporate income taxes (4.3 per cent). Resource revenue of \$2.9 billion accounts for about 6.5 per cent of total revenue. There are a plethora of fees, licenses, premiums and other tax and revenue sources that in aggregate account for about 20.2 per cent of total revenue. Also identified is \$353 million in revenue from the TIER (*Technology Innovation and Emissions Reduction*) regulations, which is the provincial carbon tax imposed on large industrial emitters. More on this below. Notably absent from the diagram, of course, is revenue from a provincial sales tax as Alberta is the only province in the country that does not impose such a tax. More on this below.

On the expenditure side government operations (program spending on health, education, advanced education, social services, etc.) account for the bulk (78.0 per cent) of total spending, with capital spending, interest, other spending, etc. taking up the rest. The government estimates \$919 million in spending for COVID-19 recovery in 2021/22.

WHERE WE NEED TO GO

From the perspective of the sustainability of its public finances, the current fiscal configuration in Alberta is untenable; the province has a sizable fiscal gap that needs to be addressed going forward, one way or another. We think a balanced approach is best.

In this regard, recall from above that in per capita terms program spending is about 14 per cent higher than the rest of Canada (see Figure 1). Using Tombe's estimate of Alberta's fiscal gap of 4.2 percentage points of GDP, our calculations suggest that reducing per capita program spending in Alberta to the average of the rest of Canada would lower the fiscal gap by about 2.1 percentage points, or 50 per cent. Thus, if the province spends like the rest of Canada going forward, rather than the rich kids on the block, it can eliminate half of the fiscal gap, leaving the rest to be taken care of by higher revenues. We therefore take this as a reasonable starting point, and "anchor" our subsequent calculations accordingly. Indeed, in the April 2021 budget the government announced that bringing Alberta's spending in line with the other provinces as an explicit policy objective, and one of the intermediate term "fiscal anchors" guiding government finances going forward.⁸ The numbers presented below can be scaled appropriately if more or less is done on the expenditure side.

In considering alternative revenue sources to close the rest of the fiscal gap two broad concepts guide our discussion: efficiency and equity. Efficiency in "econ-speak" refers to the distortionary impact of a tax. All taxes are distortionary because they alter prices which in turn results in changes in economic behaviour. The greater are the behavioural effects the more distortionary and less efficient is the tax, and the greater are the costs imposed on the economy.⁹ Equity concerns the distribution of the burden of a tax, typically across different income groups. As a general rule, when evaluating alternative revenue sources there is an equity-efficiency trade-off; in order to get more of one you have to give up some of the other.

We now turn to an evaluation of some alternative revenue sources to assist in closing the fiscal gap. The revenue increases from various options we consider are shown in Table 1 as a percentage of GDP and as a percentage of the fiscal gap. This table is referred to throughout. We begin with the elephant in the room: an Alberta Sales Tax.

⁸ See Dahlby's (2021) contribution to this volume for more discussion on fiscal anchors.

⁹ See McKenzie (2019) for further discussion in this context.

Table 1: Options for Closing the 4.2 Percentage Point Fiscal Gap by 2030

	Expenditure Restraint to Equal ROC	6% PST	Carbon Tax Average Rebate	Carbon Tax Targeted Rebated	PIT Increase 2 pp Lower Three Brackets	PIT Increase 4 pp Top Two Brackets
Per cent of GDP	2.10	1.11	0.59	1.11	1.03	0.13
Per cent of Fiscal Gap	50.0	26.5	14.0	26.5	24.6	3.2

Source: Author calculations. Some of the calculations used Statistics Canada Social Policy Simulation Database and Model (SPSD/M). The assumptions and calculations underlying the simulations were prepared by the authors and the responsibility for the use and interpretation of these data lies entirely with them.

Notes: It is assumed that PST and PIT revenues grow proportionately with GDP. Carbon tax revenues are based on federal government projections. The PST scenario includes provincial credits commensurate with the federal GST credit. All calculations present the total impact on revenue, which is equal to the mechanical effect of the tax change less the behavioural effect which accounts for the associated shrinkage in the tax base.

THE ELEPHANT IN THE ROOM: AN ALBERTA SALES TAX

We are certainly not the first to address the issue of a provincial sales tax (PST) in Alberta.¹⁰ The introduction of a sales tax harmonized with the federal GST (a harmonized sales tax, or HST) has been recommended by economists for years, for different purposes. Several School of Public Policy papers have analyzed sales taxes in an Alberta context. For example, Bazel and Mintz (2013) argue that a PST of eight per cent (a 13 per cent HST) would enhance Alberta’s competitiveness by providing enough revenues to eliminate the personal income tax for the majority of Albertans and to reduce the corporate income tax by more than 15 per cent. McKenzie (2019) similarly argues that a sales tax in Alberta would be an efficient, stable and non-volatile revenue source that would help get the province off of the royalty roller-coaster. Finally, and more in keeping with the theme of this paper, Tombe (2018) discusses the role of a sales tax in addressing Alberta’s fiscal gap.

The lack of a PST appears to be a matter of provincial pride, and an important part of the often touted “Alberta Advantage”. However, the absence of a sales tax in the province’s fiscal tool-kit is an outlier, both nationally and internationally. Of course all of the other provinces have some form of a sales tax.¹¹ The United States is the only Organization for Economic Co-operation and Development (OECD) member country without a national value-added tax,¹² however 45 U.S. states levy sales taxes, and local sales taxes are imposed in 38 U.S. states.¹³ In 2018, VAT/GST-type taxes were responsible for an average of 20.4 per cent of total tax revenues (equivalent to 6.8 per cent of GDP) in OECD countries (OECD 2020 Annex 1.A.4). In Canada this figure was only 13.6 per cent (4.4 per cent of GDP), where the low 5 per cent national GST rate is supplemented by provincial sales taxes in all provinces except Alberta.

¹⁰ Throughout we use PST to refer to the provincial part of a harmonized sales tax (HST). The total HST rate is the sum of the PST and the federal GST.

¹¹ None of the three territories levy a sales tax.

¹² OECD (2020) Annex 1.A.4

¹³ <https://taxfoundation.org/publications/state-and-local-sales-tax-rates/>

The introduction of a PST is clearly challenging from a political perspective. Consumption taxes are visible and, as a result, unpopular. In October 1990, less than two months before the introduction of the federal GST, a Maclean's article called it "an obsession" and "the most unpopular levy since the days of the Boston Tea Party",¹⁴ with a slim chance of success. However, a little more than a decade later, the GST is viewed as perhaps the most important legacy of Brian Mulroney's tenure of Prime Minister, more important than the signing of the Free Trade Agreement with U.S. and Mexico.¹⁵

Leaving aside how difficult it might be to "sell" a PST in Alberta, from an economic point of view it is commonly viewed as one of the least costly ways of generating revenue.¹⁶ As a general rule, people do not like paying taxes and try to avoid them by avoiding the goods or activities being taxed. Income taxes discourage earning (or reporting) income, corporate taxes discourage investment, sales taxes discourage consumption. Economists refer to these as behavioral changes. Relative to other taxes, both theory and evidence suggest that the behavioural changes in response to sales taxes are quite small; in economic jargon, the elasticity of the tax base with respect to the tax rate is relatively low. Due to these relatively small behavioral effects, sales taxes are largely viewed as one of the least distortionary and therefore most efficient ways of raising revenue, more so than personal income taxes, and certainly corporate income taxes.¹⁷ From a growth perspective there is some evidence suggesting that changing the tax mix to favour consumption taxation is associated with higher growth in GDP per capita.¹⁸

Another advantage of sales taxes is that they raise revenue from everyone who spends their income in a jurisdiction: residents, tourists, visitors, temporary workers. Bazel and Mintz (2013) estimate that approximately 10 per cent of the tax revenues expected to be collected from an eight per cent Alberta PST would come from non-residents.

One of the common arguments against sales taxes is that they are regressive, imposing a greater burden on low-income families than high income families. This is debatable. A progressive tax system imposes a higher tax rate on those with a higher "standard of living." The question then becomes how do we measure the "standard of living?" Many economists argue that consumption is in fact a better measure of standard of living than current income. Consumption out of inherited wealth, or offshore income not reported to tax authorities, etc., is subject to sales taxes, but not income taxes. Moreover, increased reliance on sales taxation can shift some of the burden of taxes to older generations who have benefited from previous periods of buoyant economic growth, and who will benefit from publicly funded health care as the population ages going forward. Finally, and importantly, even if sales taxes are regressive, this can be

¹⁴ Newman (1990)

¹⁵ Policy Options (2003).

¹⁶ See Dahlby and Ferede (2016).

¹⁷ See McKenzie (2019) for a discussion.

¹⁸ For example, see Arnold et al (2011).

taken care of by way of a refundable tax credit similar to the federal GST credit aimed at low-income earners.

We consider a PST rate of six per cent harmonized with the federal GST, giving an HST of 11 per cent in Alberta. This would be the lowest HST rate amongst the Canadian provinces (tied with Saskatchewan) and would put Alberta slightly above all U.S states¹⁹ but it would still be the sixth lowest rate among the 38 OECD countries.²⁰

The total effect on revenue of introducing a PST in Alberta consists of the mechanical effect, which ignores any shrinkage in the tax base, less the behavioural effect, which accounts for the shrinkage in the base as consumers respond to the tax by reducing expenditures. While the behavioural effect of sales taxes is small, it is not zero. Thus, unlike most previous studies, we incorporate behavioural responses into our calculations. There are not many studies of the sensitivity of the sales tax base in Canada to changes in the PST rate. One recent examination by Smart (2021) considers the impact of the reduction in the PST rate in Saskatchewan in 2006 from seven to five per cent. He estimates this led to a 5.4 per cent increase in retail sales. We use this result to model the behavioural effect of the introduction of a PST in Alberta.²¹

By our calculations the mechanical effect of a PST of six per cent, coupled with a provincial low-income credit equivalent to the federal GST credit, would generate about \$4.86 billion in revenue in 2022, which is about 1.35 per cent of GDP. Thus, ignoring behavioural effects, a six per cent PST would lower the fiscal gap by 32.1 per cent. However, accounting for the shrinkage in the tax base due to behavioural effects lowers the revenue generated by the tax by about \$860 million, giving total revenue of \$4.0 billion, which is 1.11 per cent of GDP and would close about 26.5 per cent of the fiscal gap.

Thus, by our calculations, incorporating behavioural effects and providing a credit to low-income households, a six per cent PST in Alberta coupled with a reduction in per capita expenditures to equal the rest of Canada, would close about 3.21 percentage points, or about 76.5 per cent, of the fiscal gap (see Table 1). The question then becomes, where can the province get the rest of the money?

¹⁹ California has the highest state-level sales tax rate, at 7.25 per cent. After including city, county and municipal sales taxes the average sales tax in California is 8.68 per cent. Five U.S. states have combined state-local sales tax rates of more than 9 per cent (Tennessee, Louisiana, Arkansas, Washington, Alabama). See <https://taxfoundation.org/publications/state-and-local-sales-tax-rates/>.

²⁰ After U.S. (no national sales tax), Switzerland (7.7 per cent), Japan, Australia and Korea (10 per cent). The OECD average VAT rate is 19.3 per cent.

²¹ We assume that the Saskatchewan PST is applied to the same base as the federal GST, recognizing that this is an approximation. The 2 percentage point reduction in the PST thus results in a 16.7 per cent reduction in the combined provincial plus federal sales tax rate. Combined with Smart's estimate of the increase in sales of 5.4 per cent, this suggests an elasticity of the sales tax base of 0.32. We then use the standard formula to decompose the total revenue effect of a change in the sales tax rate into a mechanical effect less the behavioural effect.

REPATRIATE THE CONSUMER CARBON TAX

The history of carbon taxes in Alberta has been, to say the least, a long and winding road. By our count, the province is currently operating under its third carbon tax regime in the last 14 years. In our view, and in light of the Supreme Court of Canada establishing the constitutional authority of the federal government to impose a so-called “backstop” carbon tax in provinces that do not comply with federal standards, it is time to move to a fourth-generation regime. But first a bit of history. It is important to distinguish between carbon taxes applied to large industrial facilities and to consumers and other businesses separately.

Alberta was the first jurisdiction in Canada to impose a carbon tax, under the *Specified Gas Emitters Regulation* (SEGR) introduced in 2007. The SEGR applied to large industrial facilities emitting more than 100,000 tonnes of carbon dioxide equivalent per year. In 2018 SEGR was replaced by the *Carbon Competitiveness Incentive Regulation* (CCIR). Alberta has been a pioneer in the use of output-based pricing systems (OBPS) in the application of carbon taxes to large industrial emitters. The OBPS is intended to provide a price incentive for large industrial facilities to reduce emissions while maintaining competitiveness for carbon-intensive trade-exposed industries, and protect against “carbon leakage” to other jurisdictions. Under the OBPS intensity-based emission targets, or benchmarks, are established. If a facility’s emissions exceed the benchmark, it must purchase carbon credits at the price set by the carbon tax; if emissions are lower than the benchmark, it may sell credits accordingly. Under the CCIR, the OBPS emissions targets for individual facilities were, for the most part, based on industry-wide intensity benchmarks, whereby each facility in a specific industry shared a common emission intensity standard. The CCIR was replaced by the *Technology Innovation and Emissions Reduction* (TIER) Regulation in 2020, which modified the OBPS, moving away from the industry-wide benchmarks to facility specific benchmarks based on historical performance.²² The industrial carbon tax under TIER applies to about 60 per cent of Alberta’s carbon emissions.²³ The TIER meets the federally mandated carbon standards for large emitters established by the federal government. As such, the backstop federal carbon tax on large emitters does not apply to large facilities in Alberta and all of the revenue generated by TIER stays in Alberta. As mentioned above, in 2021/22 the TIER is estimated to generate about \$353 million in revenue.

The so-called consumer carbon tax was introduced in Alberta in 2017. The tax was applied economy wide to various fuels based on their carbon content. This tax was eliminated in 2020, ostensibly to “create jobs and put more money back into the pockets of hard-working Albertans”.²⁴ However, under the federal government’s *Greenhouse Gas Pollution Pricing Act* (GGPA), the provincial carbon tax was replaced with the federal backstop, the *Federal Fuel Surcharge*. Under the federal backstop,

²² Each facility’s allowable emissions threshold is based on the average past performance of that facility between 2016-2018.

²³ Smaller firms, emitting less than 100,000 tonnes, may choose to opt-in to the TIER.

²⁴ Jason Kenney, as quoted in a government press release at <https://www.alberta.ca/release.cfm?xID=63919C897F608-B026-62E8-61626ECCC59B50FC>.

a federal tax is imposed in any province that does not levy the equivalent of the federal carbon tax. Albertans therefore continue to pay a carbon tax at the consumer level, however it is collected by the federal government rather than the provincial government. The Federal Fuel Surcharge also applies to businesses and industrial emitters that are not subject to the TIER. Under the GGPA 90 per cent of carbon tax revenue collected in Alberta by the federal government are returned to Albertans as lump sum “rebates”.²⁵

To sum up, since 2007 Albertans have been subject to three different carbon tax regimes: 1) 2007-2017, SEGR levied on large industrial emitters, no consumer carbon tax; 2) 2017/2018-2019, CCIR levied on large industrial emitters, provincial consumer carbon tax levied on fuel; 3) TIER levied on large industrial emitters, federal consumer carbon tax levied on fuel. In our view, it is time for a fourth-generation carbon tax regime, one which repatriates the consumer carbon tax, and the associated revenue, to Alberta.

We think that there are two compelling arguments to do this. First, the federal government has been quite flexible in accepting provincial carbon tax and pricing regimes as meeting the federal standard to avoid the imposition of the backstop; and indeed, there is a relatively wide variation across the provinces. This means that Alberta has some flexibility to implement a “made in Alberta” consumer level tax on its own. Second, and more relevant to this discussion, the province would be able to keep the revenue and do what it wants with it. Frankly, politics aside, in our view repatriating the consumer carbon tax is the proverbial “no brainer”.

In 2021 the carbon tax rate is \$40 per tonne of CO² emissions. According to federal government data, for 2021 carbon tax revenue in Alberta under the federal policy is expected to be about \$1.8 billion, increasing to over \$2.2 billion when the tax increases to \$50 per tonne in 2022, and to over \$2.8 billion when the tax increases to \$60 in 2023. By 2030, when the carbon tax is slated to reach \$170 per tonne, taking account of estimated behavioural effects as emissions decline in response to the rising tax, consumer carbon tax revenue from Alberta is anticipated to be about \$6.3 billion.²⁶ If Alberta was to repatriate the carbon tax this revenue would accrue to the province rather than the federal government. The question is then what should it do with the money? There are, of course, a myriad of possibilities.

One of us has argued previously that carbon tax revenues should be used to lower other distortionary taxes, such as the PIT and the CIT, rendering the tax revenue neutral.²⁷ From the perspective of pure economic efficiency this is widely thought to be the best approach, dominating the return of the revenue in the form of lump sum

²⁵ The term “rebate” is a misnomer, as the revenues are in fact returned on a lump sum basis to all Albertans independently of how much carbon tax they actually pay. However, we use the term “rebate” in what follows as it reflects its common usage in Canada in this context. The remaining 10 per cent of revenue is allocated to universities, schools, nonprofits, indigenous communities and medium-sized businesses to help offset the impact of the carbon tax.

²⁶ This is based on federal government forecasts of carbon tax rebates in Alberta discussed below, which suggest about a 20 per cent reduction in emissions over this period due to the rising carbon tax rate. See footnote 20.

²⁷ See McKenzie (2019).

transfers.²⁸ However, this implicitly presumes that the province is in a sustainable fiscal balance. In light of the substantial fiscal challenge facing the province this may not be a prudent use of the revenue under the circumstances. As such, in keeping with the perspective of this paper we argue that some of the revenue from repatriating the consumer carbon tax could be used to help close the fiscal gap, effectively forestalling the need to raise more revenue for this purpose by increasing other more distortionary taxes like the PIT or CIT. There is no such thing as a free lunch.

In 2021 the average household in Alberta is expected to pay \$598 in carbon taxes under the federal system; however, the average lump sum rebate per household is forecast to be \$953.²⁹ This is because higher income households pay more in carbon taxes. By 2030 the average household is expected to pay about \$1,740 in carbon taxes and receive \$2,764 in rebates. Thus, under the federal carbon tax regime the average household receives a rebate about 1.6 higher than the amount of carbon tax they actually pay.

Carbon taxes are generally viewed as being regressive, falling more on lower income households than higher income households. This is based on the observation that households at the bottom of the income distribution spend a larger share of their income on carbon-intensive products like gasoline, electricity, and natural gas than do higher income households.³⁰ This suggests that from an equity perspective some sort of rebate to lower income households is desirable. However, it is apparent from the above that the rebates under the federal system are overly generous for the bulk of the population. One option under a repatriated consumer carbon tax would be for the province to lower the rebates to coincide with average carbon taxes paid. Rather than returning 90 per cent of carbon tax revenue to households in the form of rebates this would return 60 per cent. Based on the 2021 figures, this would free up \$355 per household that could be used to address the province's fiscal gap; by 2030 this would increase to about \$1,024 per household.

Recall from above that by our rough calculations reducing per capita expenditures in Alberta to the average of the rest of Canada, coupled with a six per cent provincial PST (with a low income credit), would eliminate about 3.21 percentage points, or 76.5 per cent, of the 4.2 per cent fiscal gap. Repatriating the carbon tax and lowering the lump sum rebates to reflect carbon taxes paid by the average household would close an additional 0.59 percentage points (14.0 per cent) of the gap by 2030. These three measures combined would thus close about 3.80 percentage points, or 90.5 per cent, of the fiscal gap by 2030.

However, we think there is a better approach. B.C. targets the lump sum rebates from their carbon tax to middle- and low-income families, with payments declining by 2 per cent over a family income threshold. For example, for a household with two adults

²⁸ See McKenzie (2016, 2019).

²⁹ <https://www.canada.ca/en/department-finance/news/2020/12/climate-action-incentive-payment-amounts-for-2021.html>.

³⁰ This view is not universally held. For example, Beck et al (2015) find that the carbon tax in British Columbia is slightly progressive across the income distribution even before taking account of rebates or other measures.

and two children, the family income threshold in 2021 is \$42,165 and the rebates cease at income of \$64,665. Under this more targeted approach, B.C. allocates about 16 per cent of their carbon tax revenue to rebates.³¹ If Alberta took a similar targeted approach to rebates, it could eliminate about 1.11 percentage points, or 26.5 per cent, of the fiscal gap with the carbon tax revenue (see Table 1). Coupled with a six per cent HST and expenditure cuts that bring Alberta in line with the other provinces this would close the entire fiscal gap by 2030.

Of course, many other combinations are possible. Our point is that Alberta can achieve a fiscally sustainable path over the next decade with a combination of expenditure restraint that would bring the province in line with the rest of the country, the imposition of a six per cent provincial PST (with low-income credits) that would be the lowest in the country, and repatriating the consumer carbon tax coupled with targeted lump sum rebates similar to the approach followed in B.C.

It bears mentioning that carbon tax revenue is likely to fall after 2030 as emissions decline and no further increases in the tax rate are anticipated. As such, the province may need to adjust its fiscal configuration again at that time. But first things first.

There are, of course, other revenue levers available to the province. We discuss some of these briefly below.

PICK YOUR POISON: INCREASES IN PERSONAL INCOME TAXES

As indicted at the outset, we constrain our analysis by tying it to the objective of closing the 4.2 percentage point fiscal gap calculated by Tombe. As such, if the province does not adopt a provincial PST or repatriate the consumer carbon tax as discussed above, it must close the gap in some other way. In our framework, the province must pick its poison. Here we briefly consider increases in personal income taxes (PIT).

There are many ways of increasing PIT, but we focus here on just one, admittedly somewhat arbitrary, approach to get a feel for the magnitudes involved. To fix ideas, we consider a configuration of increases in PIT rates that would generate about the same revenue as a six per cent provincial PST.

Specifically, we consider a two-percentage point increase in the bottom three provincial tax brackets (currently 10, 12, and 13 per cent) and a four-percentage point increase in the top two brackets (currently 14 and 15 per cent). The two-percentage point increase is thus applied to all taxable income less than \$209,952, and the four-percentage point increase is applied to taxable income in excess of this, roughly to the top 1 per cent of tax filers in Alberta.³²

³¹

In B.C. forecast carbon tax revenues for 2021/22 are \$1.985 billion and the Climate Action Tax Credit is projected to cost \$312 million. See https://www.bcbudget.gov.bc.ca/2021/pdf/2021_Budget%20and%20Fiscal%20Plan.pdf.

³²

See Statistics Canada high income tax filers data base at <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1110005501&pickMembers%5B0%5D=1.12&pickMembers%5B1%5D=3.3&cubeTimeFrame.startYear=2014&cubeTimeFrame.endYear=2018&referencePeriods=20140101%2C20180101>

As discussed above, one of the advantages of the PST as a revenue source is that the underlying tax base is not very responsive to changes in the tax rate. Thus, the behavioural effects are relatively small, and the tax is generally viewed as being one of the most efficient ways of raising revenue. Personal income taxes are a little less so. In particular, there is significant evidence that individuals at the top of the income distribution, in particular the top 1 per cent, react to changes in the marginal tax rate by reducing their taxable income, though there is some disagreement on the precise magnitude of this behavioural effect. The primary mechanism is tax planning and avoidance by way of income shifting. On the other hand, individuals at lower income levels are relatively unresponsive to changes in tax rates. In our calculations we therefore take account of behavioural effects associated with the increase in the tax rates for the top two brackets only.³³

As shown in Table 1, the two-percentage point increase applied to the bottom three brackets does the heavy lifting here, generating about \$3.7 billion in revenue, or 1.03 per cent of GDP, in 2022. This is because it applies to a very broad base of all taxpayers earning more than the basic personal amount of \$19,369. It is interesting to note that the four-percentage point increase in the top two brackets, after accounting for behavioural effects, generates only about \$480 million, or 0.13 per cent of GDP in 2022.³⁴ Thus, we see that despite common perceptions, generating significant revenue by increasing tax rates on the “1 per centers” is difficult, even in the absence of behavioural effects — there is simply not enough money there on an aggregate basis.³⁵ In this regard, it is important to emphasize the obvious point that taxpayers in the top two brackets pay higher taxes due to the increase in the tax rates in the first three brackets.

Together, our calculations thus suggest that the PIT increases described above would generate slightly more revenue than a six per cent PST, about \$4.2 billion in 2022, or 1.17 per cent of GDP. Thus, if the choice is made to eschew the introduction of a provincial PST, a significant across the board increase in PIT rates would be required to close the fiscal gap.

Of course, there are other revenue generation options open to the government. We do not explore these here other than to say that none of them has the potential to increase revenues to the same extent as broad-based taxes like the PST or PIT. In tax policy the simple rule is “follow the money.” Further, as a rule narrowly based tax increases tend to give rise to larger behavioural effects, and are therefore less economically efficient than broad based taxes.³⁶

³³ We assume an elasticity of taxable income for the top 1% with respect to the net-of-tax rate of 0.60, which is roughly consistent with Milligan and Smart (2015).

³⁴ Ignoring behavioural effects, the increase in the top two brackets would generate about \$626 million.

³⁵ See, for example, Smart (2019).

³⁶ Some have raised the possibility of introducing a “health care levy” based on income. This, for example, was floated in the 2015 budget, but never implemented due to a subsequent change in government. From an economic perspective a health care levy is just an income tax by another name.

TIME TO GET RADICAL ON THE CIT?

Under the *Job Creation Tax Cut* introduced in 2019 the statutory corporate income tax (CIT) rate in Alberta was slated to decline from 12 per cent in 2018 to 8 per cent by 2022. However, as a part of the *Alberta Recovery Plan* in response to the pandemic, the government accelerated the tax cut to 8 percent effective July 1, 2020. At 23 percent, the general combined (15 per cent federal plus 8 per cent provincial) CIT rate in Alberta is one of the lowest in North America.³⁷ If the U.S. proceeds with an increase in the federal CIT rate to 28 percent, as proposed by the Biden administration, Alberta's CIT tax rate advantage would increase even more.

The corporate income tax (CIT) is widely viewed to be one of the more distortionary and economically costly taxes because of relatively large behavioural effects.³⁸ For example, capital investment is thought to be relatively sensitive to corporate taxes.³⁹ There are also income shifting and tax avoidance considerations which arise due to differences in statutory tax rates, both internationally and interprovincially.⁴⁰ Thus, corporate income tax increases receive a low grade from an economic efficiency perspective.

What about equity? The key issue here involves who bears the ultimate burden of the CIT, and in particular whether it falls mostly on owners of capital in the form of lower returns, and is therefore more progressive, or on labour in the form of lower wages, in which case it is less progressive. This is an unsettled issue amongst economists. However, there is good reason to believe that in a small open economy with mobile capital, which is a reasonable depiction of Canada generally and certainly for Alberta specifically, much of the burden of the CIT falls on labour through lower wages.⁴¹ This is due to the sensitivity of investment to increases in the CIT, which lowers the productivity of labour, which in turn dampens the demand for workers.

For these reasons closing the fiscal gap by way of increasing the CIT rate would not in our view be the best approach, and Alberta would be wise to maintain its current advantage on this dimension. There may nonetheless be scope for corporate tax reform in Alberta, not from the perspective of generating more revenue, but rather with a view to implementing a more efficient corporate tax system, one which encourages investment and job creation.

First some context. All of the provinces and territories except Alberta and Quebec are part of the corporate Tax Collection Agreements (TCA).⁴² The provinces subject to the TCA agree to adopt the federal tax base (taxable income) but may levy their own tax

³⁷ The federal rate in the U.S. is currently 21 percent. Nevada, Ohio and Texas do not levy a state CIT, but do impose a gross receipts tax instead. South Dakota and Wyoming are the only states that levy neither a CIT nor a gross receipts tax. The CIT rate in Mexico is 30 percent. With provincial rates of 11.5 percent, B.C. and Ontario have the next lowest combined rate in Canada at 26.5 percent.

³⁸ See Dahlby and Ferede (2016).

³⁹ See Wen and Yilmaz (2020).

⁴⁰ See McKenzie and Smart (2019) for a discussion.

⁴¹ See McKenzie and Ferede (2017).

⁴² Alberta is part of the Tax Collection Agreements for the personal income tax.

rate on that base.⁴³ For corporations with entities in several provinces, taxable income is allocated according to a formula based on wages and sales in each province. Alberta and Quebec are not part of the TCA for corporate tax purposes and levy their own CIT separately from the federal government. However, both provinces have tended to closely follow the federal CIT base. For example, when the federal government introduced accelerated tax depreciation in 2017 in reaction to the federal tax cuts in the U.S., Alberta automatically followed suit.

This needs not be the case. Alberta can adopt a different tax base than the federal government. The question is, should it?

In this regard, there is an alternative approach to taxing corporations that would, in principle, increase investment, jobs, and wages: a so-called rent-based tax. Economic rent is income earned in excess of the “normal” return on capital required to just satisfy the shareholders/owners of a business. The idea is to remove taxes levied on the “normal” return to capital and impose taxes only on the “above normal” return, or economic rent. A pure rent-based tax is thus largely non-distortionary and, at the margin, does not affect investment.⁴⁴

There are many ways of taxing economic rents, the simplest being a cash-flow tax. We will not go into a discussion of these alternative approaches here. One of us has argued elsewhere for the implementation of a rent-based tax at the federal level in Canada.⁴⁵ The question here is, can Alberta go it alone, abandon the federal corporate income tax base and replace it with a rent-based tax?

This is a complicated question, which would require careful consideration along several dimensions. We do not propose to resolve these issues here. However, as Alberta is not a part of the TCA the possibility certainly exists. Indeed, Alberta already imposes a type of rent-based tax (in addition to the CIT) under the province’s “royalty” system applied to oil sands operations. This involves levying a cash-flow tax on oil sands facilities that have achieved “pay-out”, and generated sufficient income to cover capital expenditures plus a “normal” rate of return. Is it time to take a conceptually similar approach to the entire provincial corporate tax system?

Moreover, one of the advantages of Canada’s decentralized federal system is that individual provinces can experiment with different policies. We have seen this in Canada several times, for example historically with the introduction of medicare first in Saskatchewan before it was adopted country wide, and more recently with the proposal to introduce a national childcare program based on the experience of Quebec. Further on this, some have mused that it may be time for Alberta to “go it alone” on several dimensions of policy as it seeks a “fair deal” from the rest of the country.⁴⁶ Is it time for Alberta to “go it alone” and act as a “laboratory” for a fundamental change

⁴³ Provinces can, and do, grant various tax credits which lower provincial corporate taxes payable directly.

⁴⁴ Rent-based taxes could have inframarginal effects and affect firm location decisions. For a discussion see McKenzie and Smart (2019).

⁴⁵ McKenzie and Smart (2019).

⁴⁶ <https://www.alberta.ca/fair-deal-panel.aspx>. See also Mintz et al (2020).

in the taxation of corporate income in Canada? These are complicated questions for another day. We raise them here as being worthy of further study and consideration going forward.

CONCLUSION

The purpose of this paper is to examine some revenue options that will help put the province of Alberta on a sustainable fiscal track. The analysis is anchored, disciplined if you will, by the need to eliminate the province's fiscal gap of 4.2 percentage points of GDP by 2030, as calculated by Tombe (2021) in his contribution to this volume.

Our operating assumption throughout is that Alberta can close half of the fiscal gap by way of expenditure restraint that brings the province roughly in line with the rest of the country in per capita terms. This leaves the remainder of the gap to be closed by new revenue.

The analysis is by no means exhaustive. Rather we focus on a few selected alternatives in order to provide a feel for the magnitudes involved. In particular, we argue that if relatively modest expenditure restraint is coupled with a six per cent provincial sales tax (harmonized with the GST and with target low-income credits) and a repatriation of the consumer carbon tax (with targeted low-income rebates) Alberta can achieve fiscal sustainability. We think that this provides a reasonable path to sustainability for the province, while maintaining some of the vaunted "Alberta Advantage" with similar expenditures to the rest of Canada on a per capita basis, coupled with the lowest CIT and sales tax rates in the country. However, other options are obviously available which rely more or less on expenditure restraint, more or less on sales and carbon taxes, and more or less on personal income taxes. Regardless of the approach taken, further research on the efficiency and distributional implications is merited.

We emphasize that we take a long-run perspective in this paper. It is possible that commodity prices will rise, and the province's fiscal situation will improve, over the next few years as we emerge from the COVID-19 pandemic. Or not. As stressed by Tombe (2021) in his contribution to this volume, there are considerable uncertainties ahead which have significant implications for the province's fiscal sustainability.

Ignoring the fiscal realities facing the province won't make them go away. Hoping for a surge in resource revenues is not a plan. And if it occurs at all it would offer at best a temporary respite from the province's fiscal reality. Indeed, if such a surge occurs there is merit in using some of the revenue to bolster saving or paying down the provincial debt.⁴⁷ But this is a discussion for another day.

One thing is clear – postponing the day of reckoning for too long will only make matters worse. In keeping with the themes of the paper, "there is no such thing as a free lunch", the province must "follow the money" and "pick its poison". The choices may be difficult, but the math is simple; and choose we must.

⁴⁷

Paying down debt or investing in a savings fund is essentially a portfolio composition decision.

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Danielle Smith is the President of the Alberta Enterprise Group. As a University of Calgary graduate with degrees in Economics and English, Danielle has had a lifelong interest in Alberta public policy and finding the right balance between free enterprise and individual freedom, and the role of government. Danielle's public policy experience began with an internship at the Fraser Institute. She was also elected as a trustee for the Calgary board of education and served as the director of the Alberta Property Rights Initiative and the Canadian Property Rights Research Institute. She was also the director of provincial affairs for Alberta with the Canadian Federation of Independent Business. She was a Member of the Legislative Assembly for Highwood, leader of the Official Opposition, and leader of the Wildrose Party. Before entering politics, Danielle had extensive experience in the media. Most recently she was a radio host with Corus

Entertainment for six years. She was also an editorial writer and columnist at the Calgary Herald, she served as host of Global Sunday, a national current affairs television talk show, and was the host of two programs on CKMX 1060 AM radio in Calgary, Health Frontiers and Standing Ground. She has made frequent guest appearances as a commentator on TV and radio. She married her husband, David Moretta in 2006 and together they own and operate The Whistle Stop Diner, a fully renovated 1940s railcar dining car. She is the proud stepmother of David's son Jonathan. Danielle and David live in High River with their two dogs, Caine and Colt.

Karen Spencer, P.Eng., MPP, is the Project Coordinator, Simpson Centre for Agricultural and Food innovation and Public Education at The School of Public Policy, University of Calgary. Prior to joining the Simpson Centre, Karen's policy work focused on energy and the environment in Alberta's energy sector. Ms. Spencer holds a BSc in Chemical Engineering and a Master's Degree in Public Policy. Her focus on agriculture policy is linked to both her experience in Alberta's environmental regulatory system, and her ownership of a small cow-calf operation located outside of Consort, Alberta. Recent research includes study of greenhouse gas emissions from Alberta's agriculture sector, and developing practical policy that can help to reduce emissions while enhancing economic growth. Her work continues to aim toward engaging with stakeholders and increasing transparency and knowledge in the areas of agriculture policy, climate change in Alberta, and policies that can marry the concepts of sustainability and economic growth and recovery.

Lindsay M. Tedds is currently an Associate Professor in the Department of Economics and Scientific Director, Fiscal and Economic Policy, School of Public Policy at the University of Calgary. Her primary research fields are in tax policy, public economics, and Canadian public policy and her approach to research is multidisciplinary. Her approach harnesses the strengths of economics, law, and public administration in the study of public policy problems. Her objective is to make both an academic contribution and to have an impact on Canadian policy-making and policy-implementation. She does this by publishing in a wide range of outlets, including academic peer-reviewed journals across a several disciplines, through a variety of knowledge-mobilization efforts, and by forming strategic partnerships that lead to technical reports for decision makers and the general public.

Bryce C. Tingle, QC is the Director of the Financial Markets Regulation Programme, School of Public Policy, and holds the N. Murray Edwards Chair in Business Law, at the University of Calgary. He has degrees in law from the University of Alberta, Duke, and Osgoode. He was a member of the Ontario Securities Commission's Exempt Markets Committee and he is a member of the Alberta Securities Commission's Securities Advisory Committee.

Trevor Tombe is an Associate Professor of Economics at the University of Calgary and a Research Fellow at The School of Public Policy. Prior to joining the University of Calgary, he was an Assistant Professor of Economics at Wilfrid Laurier University. His research focuses on a broad range of topics from international trade and public finance to energy and environmental policy. His current work focuses on economic integration in Canada, from estimating the size and consequences of interprovincial trade costs

to exploring the implications of fiscal transfers between provinces (such as through equalization). In addition to his academic work, he regularly promotes the public understanding of economics and policy issues through numerous public policy papers, active social media presence, and general interest writings in various media outlets.

Mac Van Wielingen is an investment management executive, corporate director, entrepreneur and philanthropist. He is Founder and Chair of Viewpoint Group, a private group of companies, including Viewpoint Investment Partners, a specialized global, multi-asset investment manager; Founder and Partner (Present) of ARC Financial Corp, the largest energy focused private equity manager in Canada; Founder and former Chair (1996-2016) of ARC Resources; current Director of the Institute of Corporate Directors (2018-present); former Director and Chair of Alberta Investment Management Corporation from 2007 to 2017; and currently serves on the Premier's Economic Recovery Council in Alberta. Based on extensive corporate and investment experience, Mr. Van Wielingen has contributed significantly to the energy sector and the interests of Albertans and Canadians, offering expert opinion to advance the vision for Canada to serve as a model for responsible resource development aligned with increasing societal Environment, Social and Governance (ESG) expectations.

Margarita Wilkins is a Research Associate in the Social Policy Program at The School of Public Policy at the University of Calgary. Her current research analyzes the finances of provincial governments and examines issues relating to poverty and homelessness. She is a frequent coauthor of *Social Policy Trends*, a publication released monthly by The School, which considers a variety of issues impacting social policy. She holds an MA in Economics from the University of Calgary.

L. Daniel Wilson has recently returned to academia after a career spanning more than 25 years as a corporate lawyer, senior business executive and serial entrepreneur. He is currently an Assistant Professor in the School of Business at MacEwan University in Edmonton, teaching a variety of courses related to business law and corporate finance. His research focus is in the area of financial markets regulation, and his 2020 PhD dissertation involved an extensive empirical analysis of the factors contributing to the decline of the number of operating public companies in the Canadian public markets. He is also the author of the Alberta Annotated Securities Legislation reference tool published annually by Lexis/Nexis.

Jennifer Winter is an Associate Professor in the Department of Economics and Scientific Director of the Energy and Environmental Policy Research Division at the School of Public Policy, University of Calgary. Her research evaluates climate policies, and examines the consequences and trade-offs of government regulation and policy on energy development. She has testified to the Senate of Canada on emissions pricing policies, and has advised the Governments of Alberta and Canada in several capacities. Dr. Winter is actively engaged in increasing public understanding of energy and environmental policy issues, and she serves on several boards and advisory committees.