




Bennett Jones

2024 Economic Outlook

The Long-Term Is Now

*The firm that businesses trust with
their most complex legal matters.*



A worker in a high-visibility vest is welding inside a large industrial tunnel. The tunnel's interior is covered in a blue grid pattern, and the scene is illuminated with a strong blue light. Sparks are visible from the welding process. The worker is positioned in the lower right quadrant of the frame, looking towards the center of the tunnel. The background shows the circular structure of the tunnel and some industrial equipment.

“As a country and a national economy, we have made little progress since our last economic report. In fact, we have lost more ground. There is a light at the end of the tunnel, and it is not benign. With tax and expenditure policy adrift, capital investment and productivity moribund, and our immigration policy ill-suited to building a highly skilled workforce, we are approaching a point where we may severely, and durably, prejudice the prospects of future generations. Our decline in per person living standards should be acceptable to no one. The sources of the problem are many. With fiscal rectitude, capital investment free of excessive policy restraints, a tax policy that at least doesn’t prejudice growth, and significant investments, including in defence production, we may mitigate economic losses incurred and preserve the international relationships that are critical to our prosperity. There is hope, but time is of the essence. The challenges for business enterprises may be daunting, but the pursuit of opportunity by focused and dynamic leaders will be critical to realizing the potential that is still within our reach.”

Hugh MacKinnon KC
Chairman and CEO, Bennett Jones

Executive Summary	iv
1. Cyclical Adjustment and Structural Transformation	1
2. Prospects for the U.S. and Canadian Economies to the End of 2025	13
Recent Developments	13
A Prudent Baseline Scenario	18
Proposed Planning Parameters for Businesses	24
3. Pursuing Advantage in a Complex World	25
4. The Labour Market: Real Wages, Immigration and Impacts of AI	33
5. Technology: Finding Our Place in a Global Race	41
Notes	54
Contributors	59

Disclaimer

The analysis and perspectives in this document are developed by the [Public Policy group](#) of Bennett Jones to stimulate discussion with clients on matters of importance for Canada's economy, public policy, and business and to assist with planning. The document does not constitute legal analysis nor offer legal advice. The views expressed in the document do not purport to represent the views of Bennett Jones LLP or of its individual partners, associates, advisors, or counsels. If you have questions or comments, please call one of the contributors listed.

The analysis in this Economic Outlook is based on published data available as of December 1, 2023.



Executive Summary

The global and Canadian economies are still adjusting to the shocks of COVID and war. Inflation remains elevated, and monetary conditions are restrictive. There are legacies, in particular high public and private debt.

Concurrently, the forces of demographic ageing, climate change, and digitalization are intensifying in a new fragmented world, transforming our economies, and requiring more public and private investment.

These two factors—short-term adjustment and structural change—set the background for our *2024 Economic Outlook*.

Near-Term Prospects

We project that global economic growth will slow to 2.6% in 2024, and rise modestly to 3% in 2025.

Under our prudent baseline scenario, the United States and Canada will both have low growth in 2024. We think that there is a good probability that the Bank of Canada (BoC) and the Federal Reserve (Fed) will begin easing monetary policy after mid-2024, supporting a recovery.

The U.S. economy will grow at an annual rate of about 2.0% from Q4 2024 to the end of 2025. Canada's economy, after slow growth in 2023, will grow faster, by about 2.9%, from Q3 2024 to the end of 2025.

At the end of 2025, inflation in both economies should be near target, and policy rates will be in the range of 3–3.5%, what may be the range for the “new” neutral rate for the Fed and the BoC for the medium term.

There are risks on both sides of our baseline scenario, but in an unstable world, they are somewhat more pronounced on the downside.

Structural Forces and the Challenge of Raising Standards of Living

Beyond this horizon, the interaction of structural forces is likely to create robust demand for investment, and continued upward pressure on costs, while lowering savings rates. This will keep nominal and real interest rates higher than pre-COVID levels. With geopolitical tensions, weak trade and a fragmentation of the global economy, medium-term growth prospects are modest.

For Canada, structural forces pose a formidable challenge. Governments and businesses have to work together to expand public and private investment, accelerate innovation, lift productivity growth and adapt the structure of our economy to sustain and raise per capita income.

Presently, we are not meeting this challenge. Our productivity growth has suffered chronically relative to the United States since the mid-1990s. Since Q1 2020, our GDP per capita has declined at an annual rate of 0.5%, against growth of 1.6% in the United States.

The investment share of our GDP must increase, with the consequence that the consumption share must fall. There can be no illusion that this will be easy since Canada must grow investment in both productive capacity and housing.

Households will have to raise their savings rate, governments exert fiscal discipline and allocate more of their revenue to investment, and businesses retain more of their earnings for reinvestment. In a world of low growth,

this implies quite possibly a period of reduced consumption in absolute terms in the near term and no increase in perceived living standards.

These are difficult messages for Canadians, ones not easily conveyed in today's political environment.

Orienting Our Business Strategies

To be on the winning side of economic transformation, and ultimately to survive and prosper, businesses have no choice but to invest in more, and more productive, physical capital and in the skilling and upskilling of their workers. They will also have to innovate and deploy the right mix of inputs, including technology and intangible assets, to raise total factor productivity.

At the heart of the transformation of the economy globally is technology.

Digital technology has permeated all parts of the economy. It is propelled further by generative artificial intelligence (AI). AI has immense potential to replace or supplement the work of humans, including highly skilled workers, and thus to be both a creative and disruptive force.

Technology is also shaping the paths and costs of the energy transition. If the pace of the transition is uncertain, what *is* certain is that technology will play a critical role in enabling reductions of emissions while preserving energy security, competitiveness and prosperity.

Competitiveness requires adopting new technology at pace—being a quick follower. Even more important, leadership requires developing new ideas, creating and owning valuable intellectual property (IP), and commercializing them successfully.

Yet, our businesses underinvest in innovation. As a proxy, total annual expenditures in research and

development (R&D) of 1.6% of GDP for Canada pale against an OECD average of 2.7%. Canada also holds a disproportionately small share of IP rights globally.

Even in domains where Canada may claim or aspire to have an advantage, including energy and AI, it is struggling to punch at its weight, let alone above it, in the global contest for technology leadership.

As digitalization and the energy transition transform the economy, there is an opportunity for our businesses to gain a stronger foothold in global value chains.

Despite an ever-changing and complex set of global rules, sanctions, regulations, and environmental, social and governance (ESG) standards, it is essential that our businesses pursue export opportunities.

Global trade is still growing, and with the right investments, our economy and our firms can build on strengths to sustain, diversify and expand trade. We can also leverage foreign investment.

Through the energy transition, Canada can capitalize on its capacity to be a reliable exporter of responsibly sourced hydrocarbons and over time pivot to export more clean energy commodities, minerals, technologies and services.

It can build on its world-class human capital, institutions and vibrant ecosystem of digital enterprises to monetize, through global trade, the value of digital innovation and services, including AI and its applications.

With the right investments in infrastructure, our agri-food sector can also draw on natural advantages, know-how and technology to add value and grow exports in markets seeking quality, safety and security of supply.



Orienting Our Policy Frameworks

The priority for monetary policy is to bring inflation back to target and keep it there. That is the best way to keep interest rates as low as possible and to support investment and economic adjustment. Given high public and private debt, low inflation is also important for financial stability.

Fiscal policy has to work in tandem with monetary policy by constraining spending on current services and transfers. It has to set out a credible short- and medium-term track, with a solid fiscal anchor. Governments should aim to keep public debt charges below 10% of their revenue. In the federal *Fall Economic Statement*, that “rule” is breached starting in 2023-24.

Governments have to be honest with Canadians that they cannot deliver greater or improved services today without raising taxes. Moreover, they have to allocate a greater proportion of their revenue to public investment that can grow our economic potential.

Structural policy—the laws, regulations and actions that shape the business environment—must be focused on investment, innovation, and productivity growth. Policy frameworks developed in prior decades have to be adapted to today’s economy. And initiatives that have proven ill-judged and that deter adjustment and investment should be corrected.

We set out five priorities: immigration, competition, taxation, frameworks for the digital economy and environmental regulation.

Immigration is now the source of almost all net growth in the labour force. We need to realign policy and programs, using them less as a stopgap to address immediate worker shortages and more as a source of highly skilled, productive workers.

Competition is the strongest incentive for innovation and productivity growth. We need more of it. Some recent and proposed amendments to the *Competition Act* may be helpful. Principally, the solution lies in trade and marketplace frameworks that keep markets open and contestable.

Tax structure matters. Incentives to work, save and invest can be strengthened, with greater reliance placed on consumption taxes. It may also be appropriate to rebalance the tax and transfer system to provide fewer advantages for retired Canadians and more for workers.

We have to move faster in adapting our business frameworks for a data economy. Our laws, regulations, standards and codes must be modernized to stimulate innovation while safeguarding consumer confidence and trust, privacy and cybersecurity. We are not keeping up.

The energy transition will require sustained, massive investment in new energy infrastructure over the next 20 to 30 years. Critical requirements are a regulatory environment and fiscal instruments that are predictable and competitive. Many matters require timely resolution.

Bottom Line

These are not easy times. We have yet to recover fully from the shocks of COVID and war. The world is uncertain. The U.S. presidential election in 2024 is a wild card. Structural change will test our economy in profound ways while presenting new opportunities.

Navigating these waters and safeguarding our prosperity require collective effort, including government and business collaboration. Our shared responsibility is to raise investment and innovation, lift productivity growth, adapt the structure of our economy and raise per capita income.

Cyclical Adjustment and Structural Transformation

The global and Canadian economies are still adjusting to the shocks of COVID and war. Inflation remains elevated, and monetary conditions are restrictive. There are legacies, in particular high public and private debt. Growth prospects for the short and medium term are weak.

Concurrently, the forces of demographic ageing, climate change, and technology and digitalization are intensifying in a new fragmented world, transforming our economies and requiring more public and private investment.

The investment share of our GDP must increase, and as a consequence the consumption share must fall. Canada must correct a record of poor investment, innovation, and productivity growth.

Canadians have to come to grips with the reality that unless we forego some consumption today in favour of more investment, we are compromising the well-being of next generations.

The Unfinished Adjustment to COVID and War

Inflation in major economies has come down from the peaks of mid-2022, but price pressures persist. Energy prices have dropped from their peaks following the Russian invasion of Ukraine. Meanwhile, supply chain bottlenecks experienced early in the recovery from COVID are largely resolved, and there has been a rebalancing of demand from goods to services, easing pressure on prices of goods. The interest rate increases delivered by central banks beginning in the first half of 2022 are continuing to work through the economy. Global growth has slowed down, helping to balance aggregate supply and demand. Nonetheless, year-to-year, and quarter-to-quarter, headline and core inflation in the major economies remain above target. Near-term inflation expectations remain elevated. Labour markets are still tight, and wage settlements are not yet consistent with the inflation target. Producers still appear to find it too easy to pass on cost increases to consumers.

Major central banks have recently signalled a pause in interest rate increases, but price and wage pressures differ significantly across advanced economies. Authorities have to manage adeptly, amid uncertainty, to return to non-inflationary growth. The Fed, the European Central Bank (ECB), and the BoC have opted at recent decision dates to leave their policy rates unchanged. The Fed last raised the Fed funds rate to 5.5% (upper limit) on July 26; the ECB last lifted its deposit rate to 4% effective September 20; and the BoC has been on pause since July 12, when it raised its policy rate to 5%. Even though the pauses have been synchronous, developments across these economies have differed. The U.S. economy to date has stayed strong, growing at an average annual rate of 3.1% in the first three quarters of 2023. In particular, despite



high interest rates, a tight U.S. labour market has supported robust consumer demand. By contrast, the economy of the eurozone, deeply affected by the war in Ukraine, stalled in the first half of 2023, notably in Germany where output is expected to contract this year. Canada's economy has also cooled down, growing at an annual rate of only 0.9% in the first three quarters of 2023. In part because of the way that a higher policy rate flows through to the cost of mortgages in Canada, there has been a faster slowdown of housing investment and consumer spending than in the United States. Business investment has also reacted more to interest rate increases in Canada. In determining the level and path of interest rates, central banks have to make careful judgements about prospects in their economies as well as global conditions and risks.

While central banks are likely to be at or near peak interest rates, the Fed, the ECB and the BoC have been careful not to signal an early easing of monetary policy.

Interest rate cuts will require clear evidence of wage pressure moderation and price-setting behaviour, and this is unlikely to occur before mid-2024. Moreover, central banks have begun to message that even when inflation comes back to target, interest rates are unlikely to return to pre-COVID levels because of structural factors affecting global savings and investment.

Higher long-term rates are now aiding the process of demand moderation, but they add to fiscal pressures for governments and, given high levels of public and private debt, they intensify risks to growth and financial stability. Bond markets were initially slow to react to the implications of inflationary pressures for interest rates (Charts 1.1 and 1.2). Since then, long-term rates in the United States, Canada and globally

have moved up appreciably. Markets appear to have priced in the judgement that central bank policy rates, and hence long-term bond rates, will remain elevated even once inflation is back to target. Higher long-term rates are aiding the process of disinflation, but this comes at a cost. For governments, including the Government of Canada, debt service charges are absorbing a higher share of revenue, crowding out spending. For households, higher long-term rates mean a more lasting impact on mortgage rates, and financial stress. For businesses, they mean a higher cost of financing. Globally, higher long-term rates, and/or a widening of risk spreads, pose risks of distress for heavily indebted governments and private enterprises.

Chart 1.1:

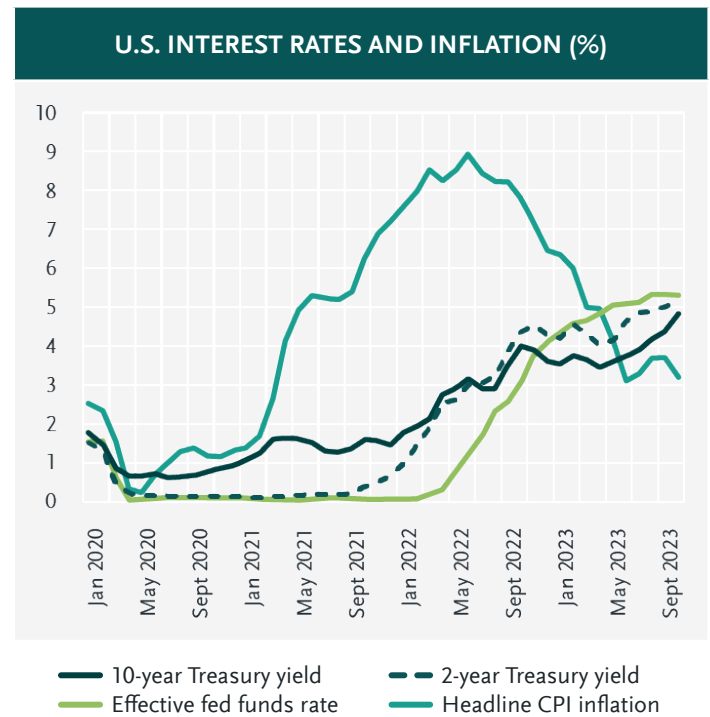
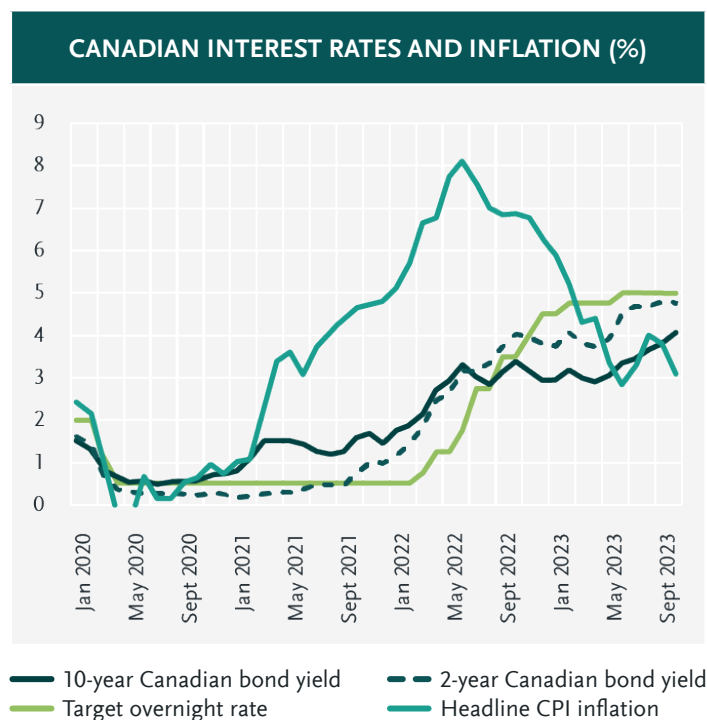


Chart 1.2:



Prospects and Risks to the End of 2025

Our outlook for the United States and Canada to the end of 2025, detailed in Chapter 2, is based on the expectation of low growth for the global economy in 2024 and a moderate recovery in 2025. Specifically, we project global GDP growth of 2.6% in 2024, down from 2.9% in 2023 and 3.5% in 2022. Growth would strengthen to 3% in 2025.

Under our prudent baseline scenario, the United States and Canada will both have weak growth in 2024. The U.S. economy will decelerate as excess savings accumulated by households during COVID are exhausted, fiscal impulses from bursts of government spending attenuate or reverse, and past interest rate increases act on consumption and investment.

If demand stays strong, the Fed will take corrective measures. Thus, we expect near-zero growth until the third quarter of 2024 (Q3 2024). Canada's economy, after slow growth in 2023, will stay roughly flat through Q2 2024.

We think that there is a good probability that the BoC and the Fed will begin lowering their policy rates after mid-2024, supporting a recovery. As inflation comes down, the two central banks will continue to lower rates in 2025. The U.S. economy will grow at an annual rate of about 2% from Q4 2024 to the end of 2025. After a more prolonged slowdown, Canada's economy will grow faster, by 2.9% from Q3 2024 to the end of 2025. At the end of 2025, inflation in both economies should be near target and policy rates will be in a range of 3–3.5%, what may be the range for the “new” neutral rate for the Fed and the BoC for the medium term.

There are risks on both sides of our baseline scenario, but in an unstable world they are somewhat more pronounced on the downside. The domestic risks are more or less balanced. The process of reining in inflation may prove to be quicker than expected, in which case output would be higher over the period than in our baseline scenario. However, if inflation and near-term inflation expectations prove stickier, affecting wage settlements and the price-setting behaviour of firms, interest rates will be higher and the adjustment will be longer. Global factors pose more downside than upside risk. Wars and geopolitical conflicts at any time may disrupt commodity markets and supply chains. Debt crises could reverberate across global capital markets. Such developments would complicate considerably the already difficult balancing act of central banks in getting inflation back to target.



The Effects of Structural Forces on Economic Conditions and Prospects

Our baseline scenario reflects principally the adjustment of the global and Canadian economies to the shocks of COVID and war, aided by policy actions to restore the stability of prices and output. However difficult this adjustment has been, and continues to be, the structural transformation of the economy poses even greater challenges for both the public and private sector.

Structural forces—demography, climate, technology and digitalization, and geoeconomic fragmentation—are now acting more visibly on the economy, affecting aggregate output and prices as well as markets for goods, services, labour, capital and technology (Box 1.1).

Box 1.1

STRUCTURAL FORCES ACTING ON THE ECONOMY AND OVER THE LONG TERM

- **Demography.** In major developed economies, ageing of the baby boom generation can be expected to both diminish private savings (as seniors draw on their retirement savings) and accentuate public dissavings (as governments spend more for health and elderly care). Demographic trends imply that even with immigration there will be fewer working-age Canadians in proportion to the total population. Moreover, since nearly all our net future labour force growth will come from immigration, the selection and adaptation of immigrants will be critical for our economic potential.
- **Climate.** The consequences of climate change are becoming ever more pronounced: 2023 is on track to become the hottest year on record globally, with temperatures projected to average about 1.4 degrees Celsius above the pre-industrial average.¹ In Canada, as early as August, raging forest fires had emitted double the previous record amount of carbon, representing CO₂-equivalent emissions surpassing those of the economy.² Floods have devastated communities, notably in Nova Scotia. While fossil fuels still represent 80% of primary energy demand, and while the demand for oil in particular is still growing, a larger share of energy investment globally is now allocated to clean energy and clean technology. The public and private sectors are aiming for net zero. The International Energy Agency (IAE) estimates that by the end of 2023 US\$1.7 trillion will have been invested in clean technology, upstream and downstream, compared with slightly more than US\$1 trillion in oil, natural gas and coal.³ Yet, the pace of the energy transition is uncertain, and economic trade-offs are complex. Re-engineering the economy requires massive investment in energy infrastructure, materials (e.g., minerals), industry, buildings and transportation. Planning, financing and executing investments while ensuring the security, reliability and competitiveness of energy supply is a critical challenge. For Canada, transitioning an energy industry that is a dominant source of economic activity and exports is existential.
- **Technology and digitalization.** The energy transition is matched by the transformation of the economy through digitalization,

which accelerated during COVID and is now spurred by the emergence of generative AI. The technology is disruptive: AI is expected to have a significant impact on the jobs of highly skilled workers. The net effect will depend on whether and how the technology augments work, as opposed to merely replacing it. It will also depend critically on worker retraining to make the best use of the technology. There is early evidence of the potential for AI to lift productivity significantly, but for any business, and for the economy writ large, earning this productivity dividend requires upfront investment in innovation, as well as an enabling policy framework. This is a matter of relevance not only to the information technology sector, but to all sectors of the economy, where innovation will have to be driven through the development of productivity-enhancing applications.

- **Geoeconomic fragmentation.** Our economies have to restore and sustain non-inflationary growth without the benefit of the efficiency gains and downward pressures on prices delivered by globalization over the last decades. Moreover, the peace dividend earned after the collapse of the Soviet Union is gone, and the provision of national security will absorb more resources. The fragmentation of markets and the shortening of supply chains can provide added security of supply, but they require more investment and impose added costs. As reviewed in Chapter 3, businesses have to navigate an ever-changing and complex set of rules, sanctions, regulations, and ESG standards and tracing requirements. Carbon border adjustments and industrial strategies further cloud the competitive field and add to the regulatory and policy uncertainty faced by businesses.

The interaction of these factors is complex and uncertain. There is a large body of analysis saying that what lies ahead is robust demand for investment and continued pressure on costs simultaneous with a lowering of savings rates, high nominal and real interest rates, and modest growth. As stated above, even with inflation back to target, interest rates are unlikely to return to pre-COVID levels. That is true for short-term rates, which will be higher because of cost pressures in a supply-constrained world. As cautioned by Deputy Governor Carolyn Rogers in a speech

delivered on November 9, it is true for long-term rates because of structural factors and high government debt.⁴ In Chapter 2, we project long-term government bond yields of 3.5% in the United States and Canada by the end of 2025. Stronger investment should generate productivity gains over time and support growth, but there will be adjustment costs along the way. Overall, the International Monetary Fund (IMF) projects global growth of 3.1% over the medium term, well below the historical average of 3.8%.⁵



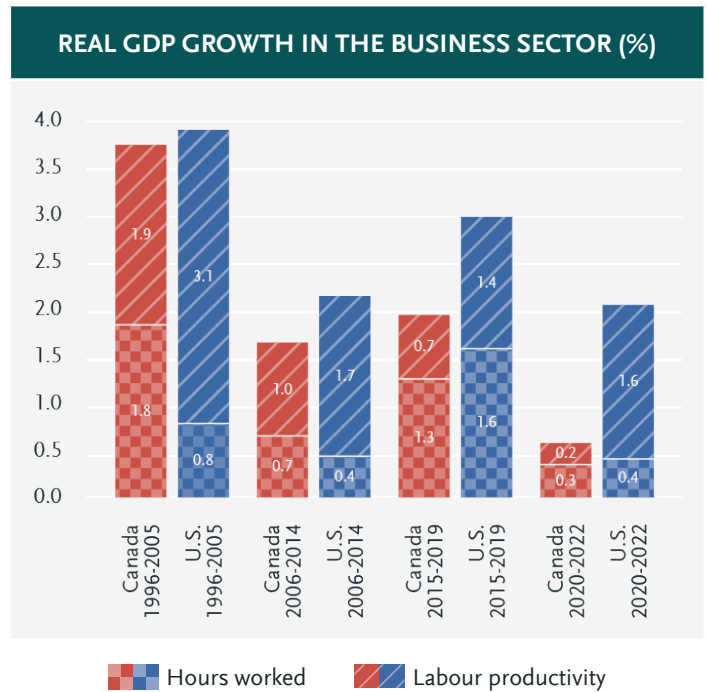
The Challenge for Canada

For Canada, long-term forces pose a formidable challenge, requiring us to expand public and private investment and innovation, lift productivity growth and adapt the structure of our economy to raise per capita income.

We have to shift from relying excessively on the expansion of the labour force and hours worked to grow the economy. Since the mid-1990s, and through the COVID recovery, additions to labour inputs in Canada’s business sector have exceeded or roughly kept pace with those in the United States (Chart 1.3). However, Canadian businesses have been consistently less successful in growing labour productivity. The result since 2015 is much slower growth in real GDP per capita (Chart 1.4). For the period of 2020 to Q3 2023, real GDP per capita fell in Canada while it rose in the United States.

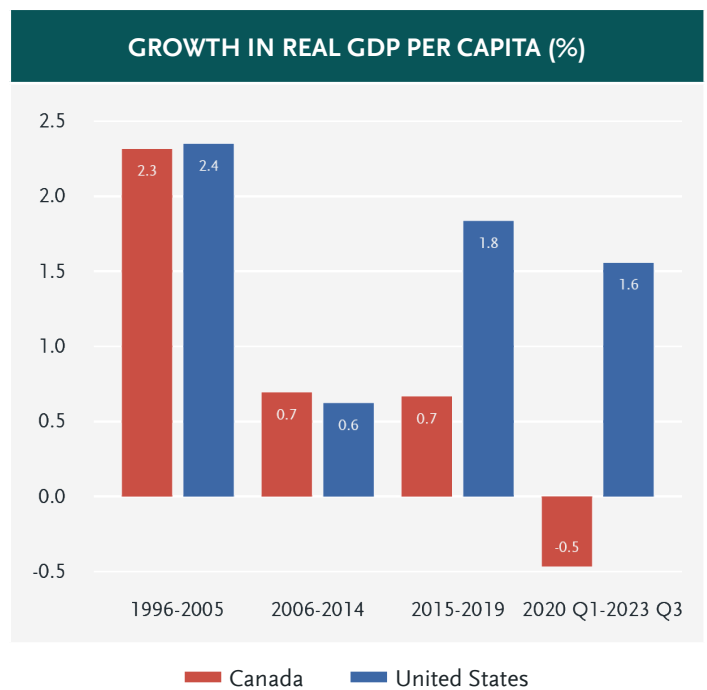
Lifting productivity requires not only deploying more physical capital per worker, but deploying the right mix of labour, capital and technology in innovative ways. Historically, Canada has invested less per unit of GDP and per worker than the United States. As explained in prior *Economic Outlooks*, investment in non-residential structures in Canada (e.g., energy infrastructure) has been proportionately strong, whereas it has been consistently weak in machinery and equipment, R&D, and IP. Since the mid-1990s, the contribution of capital intensity to Canada’s productivity growth has roughly matched the United States—our problem of underinvestment has not become consistently worse (Chart 1.5). Where Canada has fallen further behind throughout the period is in multifactor productivity (MFP). Empirically, MFP is a residual—the gap in labour productivity not explained by capital intensity or by the composition (e.g., education levels) of workers. It is a proxy for innovation, for ingenuity in creating value from the right combination of inputs: labour, physical capital, and intangible assets. Consistently slower gains in MFP explain most of our worsening labour productivity relative to the United States since the mid-1990s.

Chart 1.3:



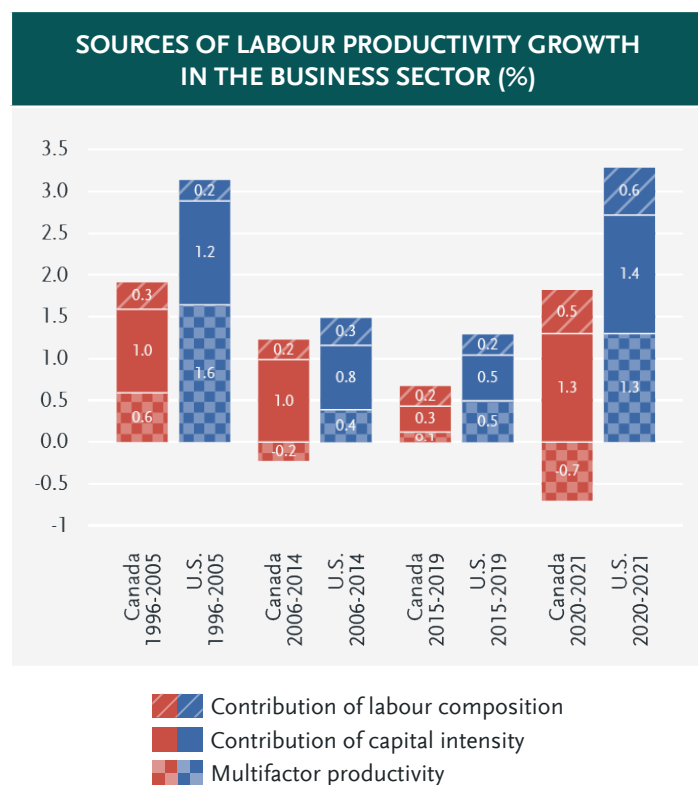
Sources: U.S. Bureau of Labor Statistics and Statistics Canada table 36-10-0480-01.

Chart 1.4:



Sources: U.S. Bureau of Economic Analysis and Statistics Canada tables 36-10-0104-01 and 17-10-0009-01.

Chart 1.5:



Sources: U.S. Bureau of Labor Statistics and Statistics Canada tables 36-10-0206-01.

Despite high interest rates, an uncertain global outlook and fragmented global markets, Canada must respond to structural forces and intensify investments in infrastructure, machinery and equipment, skills, innovation and IP to compete globally.

This entails:

- Shifting output from low productivity to higher productivity activities.** Businesses that are generating low value added (and paying low wages and/or earning low profits) must either raise productivity or shrink so that resources may be reallocated to higher value-added activity. Sustaining low productivity businesses, for example by increasing the supply of temporary foreign workers (see below), will impede this adjustment and perpetuate or worsen our productivity gap.

- Diversifying, expanding and over time shifting our trade of goods and services.** Lifting investment will require more imports of capital goods. Meanwhile, global demand will shift, for example towards energy, materials and technology for a lower-emitting and ultimately net-zero economy. We have to capitalize on export opportunities, innovate and over time adapt our industries to sell the goods and services that the world will want to buy. Energy products, minerals and mineral products, and motor vehicles and parts, that are at the center of the energy transition, represent about 50% of our merchandise exports.⁶ As discussed in Chapter 3, in a fragmented and uncertain world, Canada has to build on strengths in these and other industries, such as digital industries and agri-food, and intensify efforts to diversify and grow our exports.
- Leveraging technology for market advantage.** *Competitiveness* requires adopting available technology at pace: there can be considerable advantage in being an early follower. As elaborated in Chapter 5, *leadership* in the global marketplace requires developing new ideas, creating and owning valuable IP, and commercializing them successfully.

There can be no illusion that this will be easy at a time when Canada must also raise investment in housing.

The Canada Mortgage and Housing Corporation (CMHC) estimates that under a business-as-usual scenario 1.66 million new housing units will be built in Canada between 2022 and 2030. However, it also estimates a supply “gap” of 3.5 million units by 2030, compared with levels that would meet demand and support housing affordability.⁷ This would mean tripling housing construction. The numbers cited by the CMHC are out of reach, but it is clear that the capacity of the economy to deliver investment and the savings to finance it will be tested.

To fund stronger investment, households will have to raise their saving rate, governments will have to exert fiscal discipline and allocate more of their revenue to investment, and businesses will have to retain more of their earnings for reinvestment. Part of the funding



can come from foreign savings, and indeed Canada should actively pursue foreign investment in new productive capacity. But in a supply-constrained world, with our high levels of public and household debt, collectively we cannot simply borrow our way to higher investment.

In sum, to grow investment and build future prosperity, we have to raise national savings and reduce current consumption as a share of the economy. In a world of low growth, this implies quite possibly a period of reduced consumption in absolute terms and no increase in perceived living standards in the near term. Admittedly, this is a difficult message for Canadians.

The Policy Framework to Make This Work

The challenge we set out is a collective one for Canadians; it is not one that any government can solve. Leadership in both the public and private sector is important, to make the right diagnostic, bluntly, to set our ambitions and goals, to mobilize resources, to align partners, to execute.

Still, federal authorities have to articulate a strategy, shape the framework and deliver on priorities.

The priority for monetary policy is clear: to bring inflation back to target and keep it there. Low inflation will foster stability and confidence, and it will help keep both nominal and real interest rates low. This will support higher savings and more investment. This is not a time to fetter central bank independence, nor to advocate easier inflation targets to provide short-term relief to borrowers.

Fiscal policy has to work in tandem with monetary policy by constraining spending on current services and transfers; it has to establish a solid fiscal anchor, and most importantly it has to allocate a greater proportion of government revenue to public investment. Governments, federal and provincial, have to be honest with Canadians that they cannot deliver greater or improved services today without raising taxes. By the same token, governments can

ill-afford broad-based tax cuts while making the necessary investments in infrastructure, housing, skills development, R&D, and national security.

Structural policy—the laws, regulations and actions that shape the business environment—must focus on investment, innovation and productivity growth. Policy frameworks developed in prior decades have to be adapted to today's economy. And recent experiments that have proven ill-judged should be corrected.

There is a risk in establishing any list. It may be too short or too long. We set out five priorities: immigration, competition, taxation, frameworks for the digital economy, and environmental regulation (Box 1.2).

Situating Our Efforts in a Changing World

Policy initiatives and business strategies to bolster productivity and compete globally have to be responsive to, and support, Canada's trade and investment relationships with other major economies.

Relationships with three major economies are deserving of particular attention.

- **The United States.** The presidential election in November 2024 may be a game changer. Canada managed reasonably well under a first Trump presidency. It can take nothing for granted after 2024, regardless of the outcome of the election. The federal government has the lead role in managing the relationship not only with the White House, but with other parts of the U.S. government, notably Congress, and with states. The immediate task is to ensure that Canada is prepared for a range of scenarios.
- **China.** Efforts by the U.S. administration to keep lines of communication open with China at seniormost levels, including the recent Biden–Xi meeting on the margins of the APEC Summit, should inspire the Government of Canada to pursue a renewed dialogue. China remains by far our second-largest trading partner. Our exports

of goods to China grew 2.2% in 2022 to \$29.2 billion, while our imports grew 21.8% to \$69.2 billion.⁸ These numbers alone justify an ongoing political relationship that must also address a wide range of bilateral and global economic and political issues.

- **India.** Canada has to protect its sovereignty and the security of its citizens, and it cannot engage if India is not prepared to come to the table. This said, there is no Indo-Pacific strategy that does not pursue a constructive relationship with a country of 1.4 billion with a large diaspora in Canada, and expanding global influence. The task is to defend important principles while re-establishing a working relationship.

These are not easy times. We have yet to recover fully from the shocks of COVID and war. Structural change will test our economy in more profound ways still, while presenting new opportunities.

Navigating these waters and safeguarding our prosperity require collective effort, including government and business collaboration. Our shared responsibility is to raise investment and innovation, lift productivity growth, adapt the structure of our economy and raise per capita income.

Box 1.2

STRUCTURAL POLICY PRIORITIES TO DRIVE INVESTMENT, INNOVATION AND PRODUCTIVITY GROWTH

- **Immigration.** In the last years, we have altered an economic immigration system that stood as a model for the world. Specifically, we have shifted the selection of permanent immigrants, from one determined principally by a transparent point system estimating future earnings and aiming to attract highly skilled workers, to one accommodating multiple, discretionary programs to close short-term gaps in labour markets. We have also ramped up significantly the intake of temporary workers and foreign students (who can work during their studies), in both cases with streamlined paths to permanent residency. Some of the changes have created flexibility to recruit highly qualified workers (e.g., science, technology, engineering and mathematics [STEM] and health care workers). However, the programs have accommodated a large and rising inflow of workers with lower skills to close gaps in low-skill occupations. This can depress wages, sustain non-competitive businesses and thus restrain rather than stimulate adjustment, investment and productivity growth. Moreover, poor administration and the abuse of some programs are damaging the credibility of the system for immigrants and Canadians. This can be repaired by re-establishing the primacy of the point system for permanent immigration and by lowering the intake of temporary workers (recognizing a role for the programs). The recognition of the credentials of qualified foreign workers should be streamlined. This issue is reviewed in more detail in Chapter 4.
- **Competition.** Market forces provide the strongest incentive for innovation and productivity growth. A recent analysis by the Competition Bureau concludes that “competitive intensity [in Canada] has decreased from 2000 to 2020.”⁹ There is no single explanation for the trends, nor a single solution to correct them. Historically, opening



our borders to foreign trade has been the main instrument to stimulate competition. In a more fragmented, even hostile world, there can be pressures to move in the other direction and to protect our markets and producers from foreign competitors and investors. The pursuit of secure supply chains may require some nearshoring or reshoring. Moreover, in a digital economy dominated by big tech, with large network economies and “winner take most” outcomes, our policy frameworks have to create space for innovative firms to access capital and to grow at scale as Canadian enterprises, not only as acquisition targets for big tech. As a general rule, protectionism will not work, particularly for a small open economy like Canada. To the greatest extent, we must keep our borders open and pursue and take advantage of arrangements to secure our access to markets. Domestically, provinces have to get on with the job of dismantling barriers to internal trade. The changes in the structure of the economy that may be spurred by the energy transition and digitalization create an opportunity to support more competition. For example, open banking—the ability of consumers to use financial data residing in their bank to access services from other providers—could stimulate competition in financial services, lowering costs and creating new value for users. In the Fall Economic Statement, the Government of Canada committed to introduce a legislative regime for open banking in Budget 2024, and it issued a policy statement with the core framework elements. Meanwhile, the government has enacted and proposed amendments to the Competition Act. It has bolstered the resources of the Competition Bureau. Properly administered, some of the changes will be helpful.

- **Taxation.** In a period of structural change, we have to shift the burden of taxation towards consumption and away from investment. The tax system must:
 - raise sufficient revenues to cover current commitments and the additional investments that governments must make (e.g., in public infrastructure);
 - incentivize private investment (e.g., to enhance investment in physical capital, R&D and IP), to the greatest extent through measures of broad rather than narrow application;
 - raise additional revenue, to the extent that it is required, from taxes or levies that fall mainly on consumption, possibly including:
 - user fees to pay for public infrastructure, with the added benefit of facilitating financing through private capital instead of government borrowing; and
 - dedicated taxes to fund new or expanded services, for example in the domain of health care; and, as is always important,
 - keep the tax base as broad as possible and effective marginal rates sufficiently low to keep Canada competitive in attracting and retaining both foreign direct investment and highly skilled workers.

Distribution is an important consideration. Given demographic trends, it may be appropriate to rebalance the tax and transfer system to provide fewer advantages for retired Canadians and more for workers, especially young workers with families.

- **Frameworks for the digital economy.** Digitalization and the application of AI across all sectors of the economy hold the potential to vastly enhance productivity. Canada has competitive strengths in the digital economy; for example, researchers in Canadian universities are among the pioneers of AI, and there is a vibrant ecosystem of business start-ups. Yet, while some firms are doing well, we are not reaping the full benefits of our innovative capacity in the form of commercialization, ownership of IP, and scale up of Canadian firms. As discussed in Chapter 5, this is part of a greater, long-standing challenge for Canada. We like declaring ourselves global leaders and inventors in many fields, yet let others lead the commercialization of technology. Again, there are many causes, and no easy solution. In the digital world, a serious handicap for our innovators is that we are slow in developing the business frameworks for a data economy: the laws, regulations, standards and codes that may stimulate innovation while safeguarding consumer confidence and trust, privacy and cybersecurity. Parliament is still debating in committee a long-awaited modernization of federal privacy law. What is in place is an outdated patchwork of federal and provincial laws. By contrast, the *General Data Protection Regulation* (GDPR) in the 27-member European Union came into force in 2018. This not only constrains the development of our firms in their domestic market, it also cedes to others the role of establishing rules and standards in ways that support their own firms. The Standing Senate Committee on Banking, Commerce and the Economy set out a series of proposals in its recent report *Needed: An innovation strategy for the data-driven economy*.¹⁰
- **Environmental regulation.** The energy transition will require hundreds of billions of dollars of investment in energy infrastructure and resource development, including critical minerals, with a potential to position Canada as a powerhouse in clean economy supply chains. The announcement by Hydro-Québec that it plans to invest \$90–110 billion by 2035 to meet growing demand for clean electricity in Quebec alone gives an idea of the scale of projects to be developed, reviewed, financed and executed across the country to decarbonize the economy. A critical requirement is a process for regulatory review, Indigenous consultation, and permitting that respects jurisdiction and that is open, transparent, predictable and timely. The federal government promised in Budget 2023 to bring forward before the end of the year concrete proposals to streamline its processes. On October 13, the Supreme Court of Canada (SCC) issued an opinion that the federal *Impact Assessment Act* enacted in 2019 through Bill C-69 exceeds Parliament’s law-making jurisdiction. In response, the government committed to act promptly: “We will follow the guidance of the Court and collaborate with the provinces and Indigenous groups to ensure an impact assessment process that works for all Canadians.”¹¹ While the SCC did not strike down the legislation, project proponents and investors need earliest clarity on how the government intends to make its legislation conform with the decision of the Court and to streamline the delivery of processes. This will include an amended *Impact Assessment Act*. Other critical pieces of the energy and climate framework, including the treatment of emissions in the oil and gas sector, the Clean Electricity Regulations, and details of tax credits for investment in clean energy and clean technology, will also require early resolution in ways that will provide clarity, predictability and the right incentives for investment.

Prospects for the U.S. and Canadian Economies to the End of 2025

Against the backdrop of weak global growth, the economies of Canada and the United States will be roughly flat in the first quarters of 2024 as the effect of past hikes in policy interest rates continue to be felt. After mid-2024, as evidence mounts that inflation is on a firm downward track, the BoC and the Fed are likely to begin easing monetary policy. This would support a recovery in the second half of 2024 and in 2025—one that we expect will be slightly stronger in Canada than in the United States. By the end of 2025, in both economies, inflation should be at or near target and policy interest rates should be in a range of 3–3.5%, representing the “new” neutral rates.

In Canada, the fiscal plans of the federal and provincial governments suggest that policy overall will be neither expansionary nor restrictive through to 2025. However, the expenditure and borrowing tracks are optimistic. Deficits and public debt may end up higher than projected, and as a proportion of revenue public debt charges may exceed levels consistent with fiscal sustainability. Moreover, the growth of government expenditures continues to favour current services and transfers over public investment. Shifting the structure of expenditures towards public investment would support stronger, sustainable growth.

Recent Developments

1) Global Growth and Commodity Prices

The world economy has started slowing in the second quarter in the face of several headwinds, including the negative effects of monetary policy tightening, intensified geoeconomic fragmentation, extreme weather events, and the loss of purchasing power from elevated inflation. Continuing robust gains in employment and wage rates provided a partial counterweight by supporting demand through income and confidence effects. Although global headline inflation has receded considerably, underlying inflationary pressures have remained strong and core inflation has eased slowly. Annualized quarterly growth for the G-20, a proxy for global growth,¹ fell to 2.4% in Q2 2023 from 4.0% over the previous three quarters. Growth in China has lost considerable momentum, weighed down by a crisis in the property market and weakness in exports. In the eurozone, previously slow growth has turned into complete stagnation.

Table 2.1:

REAL GDP GROWTH (%) (s.a.a.r.)				
	Average H2 2022	Q1 2023	Q2 2023	Q3 2023
G-20	3.9	4.2	2.4	
Euro area	0.6	0.2	0.6	-0.2
China	9.3	9.5	2.0	5.3
Japan	-0.3	3.7	4.5	-2.1

Sources: OECD Stat and Eurostat. The average for H2 2022 corresponds to the average annualized compound growth rate during Q3 2022 and Q4 2022.

After falling from peaks around the Russian invasion of Ukraine in 2022, oil prices firmed up again between July and September 2023, to reach over US\$90 per barrel (West Texas Intermediate [WTI]), before retreating to US\$74 by the end of November.

The summer increase was supported by a series of supply cuts by OPEC+ and strong global oil demand related to travel and transport. The fall in November reflects renewed concerns about excess supply in a context of weaker global growth and larger oil supply from non-OPEC+ producers. Metals prices have been falling since January 2023, largely due to weakness in China's heavy industry and housing construction and to the negative effects of elevated interest rates on construction and investment in other countries.²

2) Growth in the United States and Canada

Real GDP growth in the United States in Q2 and Q3 2023 proved highly resilient in the face of a substantial tightening of financial conditions since

early 2022, supported by a strong labour market and an expansionary fiscal policy. In Q2, business non-residential investment and government spending made the largest contributions to growth. In Q3, growth surged to 5.2% with a strong rebound in household consumption growth (3.6%), accelerated government spending (5.5%), and a large contribution to growth from inventory investment. While real disposable income was flat in the quarter, consumption surged on the strength of a temporary rebound in consumer confidence together with a fall in the personal saving rate. The escalation of real government spending is explained by a loosening of fiscal policy from an already quite accommodative stance in 2022. The IMF estimates that the general government cyclically adjusted primary deficit will be 6% of potential GDP in 2023, up substantially from 4.1% in 2022.

Preliminary indicators for the U.S. economy in Q4 suggest weak GDP growth, probably well below 2%.

Table 2.2:

CONTRIBUTIONS TO ANNUALIZED REAL GDP GROWTH (%)		Q1 2023	Q2 2023	Q3 2023
UNITED STATES				
Real GDP growth		2.2	2.1	5.2
Contributions from:	Personal consumption	2.5	0.6	2.4
	Government spending	0.8	0.6	0.9
	Changes in inventories	-2.2	0.0	1.4
CANADA				
Real GDP growth		2.5	1.4	-1.1
Contributions from:	Household consumption	2.8	-0.1	0.1
	Government spending	0.4	0.3	1.6
	Housing	-1.1	-0.3	0.6
	Non-residential business investment	0.4	1.2	-1.0
	Change in inventories	-3.2	0.1	-1.0
	Net exports	2.6	0.2	-1.5

In Canada, real GDP growth steadily declined in 2023, from 2.5% at an annualized rate in Q1, to 1.4% in Q2 and -1.1% in Q3. Household consumption was flat in Q2 and Q3 as real disposable income barely grew while the saving rate rose from 4.4% in Q1 to 5.1% in Q3. Real government spending alone showed steady growth over this period, in fact surging in Q3 when it offset nearly half of the substantial decline in real GDP growth caused by falls in non-residential business investment, inventory investment and net exports. Housing was the only other source of strength in Q3, due entirely to a rebound in new construction.

3) The Labour Market

The labour market has been easing in Canada. Labour supply (the labour force) has expanded faster than labour demand (employment plus job vacancies).

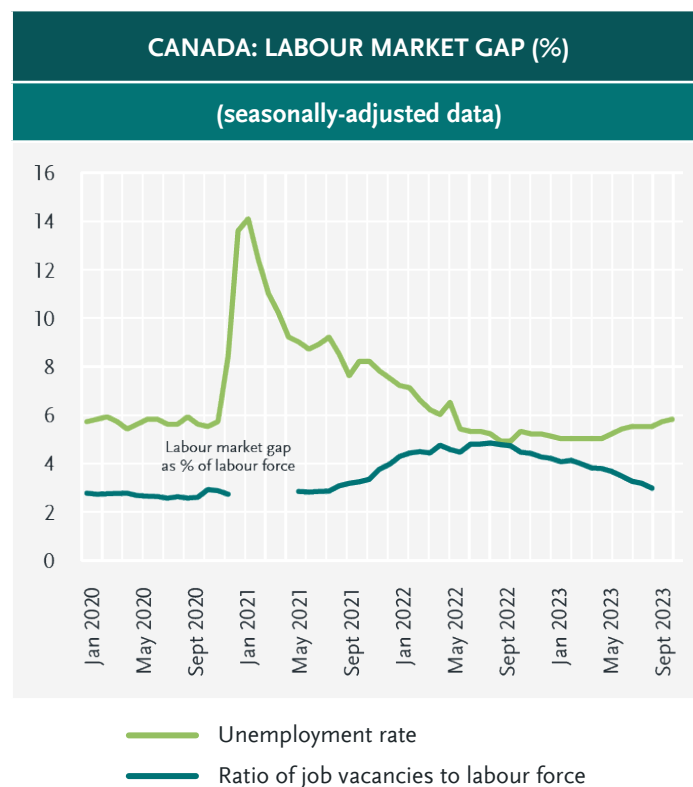
The resulting labour market “gap” measured as the difference between the unemployment rate and the job vacancies ratio, which was almost nil in mid-2022 (representing a very tight labour market), was 2.6% in September and probably above 3% in November (Chart 2.1). The labour market has also been easing in the United States.

The easing of the labour market in Canada is explained by growth in the working-age population, slower employment growth and falling job vacancies.

In the period from May to November 2023, the labour force expanded at an average annualized rate of 3%, driven by 3.2% annualized growth in the working-age population, itself explained by high levels of immigration. The labour force participation rate was stable. At the same time, annualized employment growth decelerated sharply to 1.6%, job vacancies dropped and the unemployment rate rose 0.8 points to 5.8%.

Responding with some lag to an easing of labour markets and to falling inflation, the rate of wage increases has declined slightly in recent months in

Chart 2.1:



Source: Statistics Canada tables 14-10-0287-01, 14-10-0406-01, 14-10-0426-01. The gap corresponds to the difference between the unemployment rate and the job vacancy ratio.

both Canada and the United States. On a fixed-weight basis, the yearly growth in average hourly earnings (AHE) in Canada declined from 4.7% in September to 4.2% in November. In the United States, the year-on-year change in AHE in October 2023, at 4%, was slightly below the numbers for September (4.3%) and for Q3 (4.6%). Recent wage developments in Canada are reviewed in greater detail in Chapter 4.

Job growth in the business sector has decelerated in both economies since the first quarter. Labour productivity has strengthened in the United States, to an annualized growth rate of 4%, but in Canada it has continued to fall, at an average annualized rate of -1.8%.



Table 2.3:

LABOUR MARKET TIGHTNESS AND WAGE INFLATION IN THE UNITED STATES AND CANADA						
	Q1 2023	Q2 2023	Q3 2023	Sept 23	Oct 23	Nov 23
UNITED STATES:						
Job vacancies per unemployed	1.8	1.8	1.4	1.4		
Average hourly earnings - y/y% (not s.a.)	4.4	4.3	4.6	4.3	4.0	
CANADA:						
Job vacancies per unemployed	0.8	0.7	0.6	0.5		
Average hourly earnings - y/y% (not s.a.)	5.1	4.8	5.0	5.0	4.8	4.8
Fixed-weight ave. hourly earnings - y/y%	4.9	4.6	4.5	4.7	4.3	4.2

Sources: U.S. Bureau of Economic Analysis; and Statistics Canada tables 14-10-0287-01, 14-10-0406-01, 14-10-0426-01. The fixed-weight measure of average hourly earnings for Canada is produced by Bennett Jones using Statistics Canada data.

Table 2.4:

CONSUMER PRICE INFLATION IN THE UNITED STATES AND CANADA					
12-MONTH %	Feb 23	Apr 23	June 23	Aug 23	Oct 23
UNITED STATES:					
CPI - all items	6.0	4.9	3.0	3.7	3.2
Core inflation: CPIXFE	5.5	5.5	4.8	4.3	4.0
CANADA:					
CPI - all items	5.2	4.4	2.8	4.0	3.1
Core inflation: CPIXFE	4.8	4.4	3.5	3.6	3.4
Average of CPI-median and CPI-trim	5.0	4.4	4.0	4.1	3.6
3-MONTH S.A.A.R. %					
UNITED STATES:					
CPI - all items	4.1	3.2	2.7	4.0	4.4
Core inflation: CPIXFE	5.2	5.1	4.1	2.4	3.4
CANADA:					
CPI - all items	1.6	3.7	3.1	6.0	2.8
Core inflation: CPIXFE	3.4	4.2	2.5	3.3	3.3
Average of CPI-median and CPI-trim	3.3	3.8	3.7	4.3	3.0

Sources: U.S. Bureau of Labor Statistics; and Statistics Canada tables 18-10-0004-01 and 18-10-0006-01. CPIXFE refers to CPI excluding food and energy. CPI-median and CPI-trim are two measures of core inflation designed by the Bank of Canada to capture the central tendencies of monthly price changes.

4) Inflation

Both headline and core inflation have been trending down in Canada and the United States in 2023. The marked decline in year-on-year headline CPI inflation was temporarily reversed this summer because of a large temporary pick-up in gasoline prices, but the downtrend resumed in September and accelerated in October (Table 2.4). Year-on-year core inflation has also steadily eased in both economies. Measured by CPI excluding food and energy (CPIXFE), core inflation in Canada has hardly declined since June as faster inflation in owned and rented accommodation, essentially mortgage interest cost and rent, has offset slower inflation or even outright price decline in other components. Measured by CPI-trim and CPI-median, which abstract from the most extreme monthly price changes and focus on central tendencies, core inflation has significantly declined since June.

Similarly, the annualized 3-month CPIXFE has held steady at about 3.3% since July, as an acceleration of mortgage interest cost and rent prices offset a fall or slowdown in other core prices. By contrast, CPI-median and CPI-trim point to a marked decline in annualized 3-month core inflation since August.³

5) Interest Rates and Exchange Rate

Central banks in Canada and the United States have been keeping their policy rate constant since last July. Financial conditions have nonetheless tightened because of a significant increase in bond yields. The BoC has kept its policy rate at 5% after July 12, and the Fed at 5.25–5.5% after July 26 (the ECB has also held its policy rate at 4% after September 20). Central banks have kept the door open to further increases if needed, and they cautioned that progress in the “last mile” to achieve their inflation target would be slow. While volatile, bond yields have increased since last May: the U.S. 10-year Treasury rate by 90 basis points to 4.5% in November; and the 10-year Canada bond rate by 65 basis points to 3.7%. Contributing to this rise were investors’ rapidly changing expectations about central bank policy rates, concerns about the volume of future government borrowing and a growing appreciation by

some that structural forces affecting global saving and investment will work towards keeping real bond yields higher than they have been in the period since the Great Financial Crisis.

Table 2.5:

KEY FINANCIAL RATES FOR THE UNITED STATES AND CANADA IN 2023				
	Mar	May	July	Nov
Fed funds rate	4.7	5.1	5.1	5.3
Canadian overnight rate - %	4.5	4.8	5.0	5.0
U.S. 10-year Treasury yield - %	3.7	3.6	3.9	4.5
10-year Canada bond yield - %	3.0	3.0	3.5	3.7
U.S. dollar per Canadian dollar	0.73	0.74	0.76	0.73

The Canadian dollar has lost ground since a peak in July, returning to levels only slightly below those prevailing in the first half of the year.

6) Fiscal Policy

There has been a contrast between the United States and Canada in the impulse to growth and inflation provided by general governments during the year to Q3 2023: in the United States, the impulse boosted excess demand and inflation throughout the period, whereas in Canada it is only in Q3 of 2023 that it may have accentuated excess demand and inflation. In the United States, the impulse to growth provided by the budget deficit and net capital investment averaged 1.1% of GDP from Q4 2022 to Q2 2023 and escalated to 1.6% of GDP in Q3 2023, clearly acting as a counterweight to monetary policy tightening (Table 2.6). Likewise, real government consumption and investment grew at average annualized rates of 4.5% from Q4 2022 to Q2 2023 and 5.5% in Q3 2023, clearly exceeding potential growth and boosting excess demand. In Canada, the fiscal impulse from changes in net borrowing averaged 0% of GDP from Q4 2022 to Q2 2023, but it rose to 0.8% of GDP in Q3 2023. Likewise, real government consumption and investment grew at an average annualized rate of only



1% from Q4 2022 to Q2 2023, well below potential growth, but it surged by 6.5% at an annualized rate in Q3 2023, exacerbating excess demand.

A Prudent Baseline Scenario

1) Assumptions for Global Factors

We developed our scenario for the United States and Canada against the backdrop of a deceleration of growth in the rest of the world in 2023 that continues in 2024 but reverses in 2025, when projected annual growth is still a moderate 3.2% (Table 2.7). Growth in advanced economies (other than the United States and Canada), having fallen from 2.9% in 2022 to 1% in 2023, continues to fall to 0.9% in 2024, before rebounding to 1.8% in 2025. The growth trajectory is explained by the delayed impact of the prior tightening of monetary policy and by a less accommodative fiscal stance in Europe in 2024 and 2025 as compensatory measures (e.g., energy subsidies) introduced in 2023 are withdrawn. Growth in emerging and developing economies is projected to be flatter than in the advanced economies, moving from 4.2% in 2022 to a low of 3.7% in 2024 before rising to 3.9% in 2025. Growth in China should rise to 5.5% in 2023 from 3% in 2022, and then steadily slow by 2025 to a projected rate of 4.2% as excess supply in the property market,

Table 2.7:

SHORT-TERM PROSPECTS FOR REAL GDP GROWTH OUTSIDE NORTH AMERICA (%)				
	2022	2023	2024	2025
World	3.5	2.9	2.6	3.0
World (excluding the U.S. and Canada)	3.8	3.0	2.9	3.2
Advanced Economies (excluding the U.S. and Canada)	2.9	1.0	0.9	1.8
Euro area	3.4	0.5	0.7	1.8
United Kingdom	4.1	0.5	0.5	1.0
Japan	0.9	1.7	0.4	1.0
Emerging and Developing Economies	4.2	3.9	3.7	3.9
China	3.0	5.5	4.4	4.2

an ongoing decline in the working-age population and the absence of social security reform all weigh on growth.

These assumptions are prudent: global growth is appreciably weaker in our baseline scenario than in the IMF's latest outlook for 2024 (2.6% vs 2.9% for the IMF) and 2025 (3% vs 3.2%),⁴ and roughly the same as in the latest OECD projection of 2.7% for 2024 and 3% for 2025.⁵ In particular, our expectation of growth for advanced economies, including the United States and Canada, is significantly weaker than the IMF's.

Table 2.6:

NET IMPULSE TO GROWTH FROM GENERAL GOVERNMENT				
	Q4 2022	Q1 2023	Q2 2023	Q3 2023
Change in net borrowing as % of GDP:				
U.S.	0.9	1.9	0.5	1.6
Canada	1.2	-0.1	-1.2	0.8
Growth in real consumption and investment (% a.r.):				
U.S.	5.3	4.8	3.3	5.5
Canada	0.3	1.6	1.1	6.5

Sources: U.S. Bureau of Economic Analysis and Statistics Canada tables 36-10-0118-01 and 36-10-0104-01. Net government borrowing in the national accounts essentially corresponds to the budget deficit plus net capital transfers and net non-financial investment.

Correspondingly, we have also adjusted downward in our scenario the projection for emerging and developing economies set out in the IMF's outlook.

Our scenario is also consistent with the following assumptions:

- There are no further unexpected repercussions from COVID, the war in Ukraine, or developments in global supply chains.
- The war in the Middle East has no significant disruptive impact on oil and commodity markets.
- The WTI oil price moves in a range of US\$75 to US\$85; OPEC+ supply further contracts in 2024 to mitigate the impact on oil price of a decline in global oil demand; and the supply loosens in 2025 to take advantage of strengthening demand.

2) Prospects for Monetary Policy

We judge the policy rates in both the United States and Canada to be at their cyclical peak with the fed funds rate range at 5.25–5.50% and the BoC's target overnight rate at 5%. We discount the risk of further policy rate increases because core inflation has been easing gradually and, going forward, growth is expected to be weak enough to move the economy into significant excess supply and to bring short-term inflation expectations closer to the 2% target. This being said, it will take time before central banks start reducing their policy rate as they intend to “move carefully” and “address the risk of being misled by a few good months of data,” in the words of Fed Chairman Powell.⁶

We expect that the two central banks will start lowering their policy rates sometime after mid-2024, so that by December 2024 the effective fed funds rate would be about 4.5% and the overnight rate in Canada would be about 4%. Policy rates would decline further by mid-2025 to about 3.25% in both economies and remain roughly at that level subsequently. In our view, this 3.25% level should be in the vicinity of the neutral rate that in a supply-constrained world would balance

aggregate demand and potential output in Canada and probably in the United States as well.

Table 2.8:

U.S. AND CANADIAN INTEREST RATES IN THE SHORT TERM				
	Q3 2023	Q4 2023	Q4 2024	Q4 2025
Fed funds rate	5.3	5.3	4.6	3.3
Canadian overnight rate - %	5.0	5.0	4.2	3.3
U.S. 10-year Treasury yield - %	4.1	4.6	3.7	3.5
10-year Canada bond yield - %	3.6	3.8	3.5	3.5
U.S. dollar per Canadian dollar	0.75	0.73	0.73- 0.78	0.73- 0.78

We see long-term interest rates in the United States and Canada trending down and converging by mid-2025 to about 3.5% for 10-year government bonds.

Like most analysts, we think that the Canadian dollar is likely to move within a range of US\$0.73 to US\$0.78 over the projection period. The Canadian currency will be supported by faster GDP growth in Canada than in the United States during much of 2024 and 2025, as detailed below.

3) Fiscal Policy in Canada

We judge that the fiscal plans of Canada and the major provinces, if executed, are unlikely to provide a large stimulative or contractionary impulse to growth and inflation through to 2025. In their most recent economic and fiscal updates, the federal government and the governments of Ontario and Québec project a combined deficit which increases by 0.1% of Canadian GDP in 2023–24 and declines by 0.1% and 0.2% of GDP in 2024–25 and 2025–26, respectively. In other words, fiscal deficits neither materially improve nor worsen during the period.

Taken at face value, the fiscal plans of Canada, Ontario, Québec and the other provinces suggest a



rising primary surplus that more than offsets rising debt charges and that by 2025–26 enables a reduction of the debt-to-GDP ratio. The projected debt-to-GDP ratio in 2025–26 is thus roughly the same as in

2022–23 but, with the exception of Québec, the interest-cost-to-revenue ratio will increase markedly, especially federally, where it exceeds the prudent level of 10% starting in 2023–24.

Table 2.9:

2023 FALL FISCAL UPDATES: CANADA, ONTARIO AND QUÉBEC					
		2022-23	2023-24	2024-25	2025-26
CANADA (November 21, 2023)	Deficit (\$ billions)	35.3	40.0	38.4	38.3
	Primary surplus (% of Canadian GDP)	0.0	0.2	0.5	0.5
	Federal debt (% of Canadian GDP)	41.7	42.4	42.7	42.2
	Interest costs (% of revenues)	7.8	10.2	10.8	10.6
ONTARIO (November 2, 2023)	Deficit (\$ billions)	5.9	5.6	5.3	-0.5
	Primary surplus (% of Ontario GDP)	0.6	0.7	0.8	1.4
	Net debt (% of Ontario GDP)	38.3	38.4	39.1	38.7
	Interest costs (% of revenues)	6.4	6.6	6.9	6.9
QUÉBEC (November 7, 2023)	Deficit (\$ billions)	3.1	1.8	0.7	-0.5
	Primary surplus (% of Québec GDP)	1.3	1.4	1.6	1.7
	Net debt (% of Québec GDP)	38.0	37.9	37.8	37.4
	Interest costs (% of revenues)	7.0	6.6	6.6	6.3
Change in total deficit (% of Canadian GDP)		-1.5	0.1	-0.1	-0.2

Box 2.1

OBSERVATIONS ON FEDERAL FISCAL POLICY

The Government of Canada tabled its Fall Economic Statement on November 21, 2023. We offer three comments respecting the current and projected fiscal stance and the composition of spending relative to what we judge to be most important for fiscal sustainability and economic performance.

First, the government’s fiscal policy as represented by its projection over the period to 2025 (a period over which economic and fiscal projections have

at least some degree of certainty) is unsustainable. The fiscal deficits for 2023–24 to 2025–26 are 1.4%, 1.3%, and 1.2% of GDP, respectively, which is not consistent with the government’s fiscal guardrail of a deficit not exceeding 1% of GDP that it proposes to apply in 2026–27 and future years. Moreover, debt service costs, as a proportion of revenue, after rising from 7.8% in 2022-23 to 10.2% in 2023–24, exceed the prudent ratio of 10% through the government’s 5-year planning scenario. This is despite the fact that the

government's fiscal projections are based on a 10-year government bond rate (between 3.1% and 3.3% through the period) that is low compared with our prudent projection of 3.5%. We have proposed the 10% rule as a fiscal anchor, because once debt charges absorb more than 10% of government revenue, or alternatively once citizens receive less than 90 cents of service per dollar of taxation, sustainability is compromised and debt dynamics should then be corrected quickly.

Second, and equally worrying, the financial requirements—representing the added funds that the government has to borrow in the market (in addition to rolling existing debt)—is much higher than the projected changes in the net debt over the next two fiscal years. Gross debt increases by \$111 billion in 2024–25 and \$108 billion in 2025–26, while net debt increases by only \$42 billion in each of the two fiscal years. The large difference between the two numbers is explained in part by exceptionally high levels of government loans, investments and advances, largely to Crown corporations and to large purchases of Canada Mortgage Bonds. Because these constitute financial assets of the government, debt is netted out. The sharply rising interest-bearing (gross) debt nonetheless boosts future debt service costs, while the return on the financial assets is uncertain. The oft-cited advantage of Canada vis-à-vis other G-7 countries with respect to public debt as a percentage of GDP is typically based on comparisons of net debt. It is not as compelling, and may yet diminish considerably if measured instead using interest-bearing (or gross) debt.

Third, and most worrying, the structure of federal spending continues to be geared towards transfers and services which reinforce current consumption at precisely the time when fiscal policy needs to be directed towards increasing public and private investment in productivity-enhancing physical, human and intellectual capital. In nominal terms, transfers to the elderly in 2025–26 will be up 25%

from 2022–23 and transfers to governments, largely for health care and social programs, up 22%. By contrast, spending on direct programs, including transfers to businesses, will essentially remain flat. Real program spending per capita this fiscal year will be up 6% compared to the pre-COVID level in 2019–20; it is set to rise by a modest 0.4% per year over the next two fiscal years. The higher real per capita spending is essentially due to a strong 7% annual growth of (nominal) transfer payments, mostly to persons.

While the government's projections for the outer years (2026–27 to 2028–29) must be taken with a large grain of salt, they indicate continued large increases in transfers to the elderly (about 17%), with growth of direct program expenses of less than 6% and of operating expenses of only 3.5%. At the same time, net capital investment is projected to average only \$1.5 billion, versus \$4 billion in 2024–25 and 2025–26. While the volume of loans, investments and advances is projected to remain high over the outer years, it is not entirely clear how this will translate into the higher public and private capital investments necessary to raise productivity and increase real GDP per capita. At the same time, given the structure of our tax system, projected revenue growth over the period is greater for income taxes (17.3% nominal increase between 2024–25 and 2028–29) than for the GST and excise taxes and duties (12.4%). This is unlikely to favour a necessary shift in the economy from consumption to investment.

In sum, the plan set out in the Fall Economic Statement does not meet prudent criteria for fiscal sustainability in the next two years or in the outer years. Even more worrying is that too small a share of projected spending is allocated directly or indirectly to the type of capital investment that is most susceptible to enhance productivity in the economy. Finally, there is excessive reliance going forward on increases in revenues that come from income taxes rather than consumption taxes.



4) Real GDP Growth in the United States

We project that U.S. growth will slow from an average annualized pace of 3.1% during the first three quarters of 2023 to only 0.4% in the year to Q3 2024, before accelerating to 2% on average from Q4 2024 to the end of 2025. On an annual basis, real GDP growth would be 2.4% in 2023, 1.2% in 2024 and 1.7% in 2025.

Table 2.10:

U.S. REAL GDP GROWTH				
	2022	2023	2024	2025
Year-on-year growth (%)	1.9	2.4	1.2	1.7
Q4/Q4 % change	0.7	2.7	0.5	2.1

The quasi-halt to growth during the year to Q3 2024 is due primarily to the delayed effects of the cumulative tightening of financial conditions in early 2022, to lower growth in the markets for U.S. exports and to a tightening of fiscal policy. As stated above, the IMF projects the general government cyclically adjusted primary deficit to contract from 6% of potential GDP in 2023 to 4.6% in 2024 and to edge down further in 2025. As monetary policy starts easing by the end of Q3 2024, and as firmer growth resumes in foreign markets, U.S. growth will start to strengthen during 2025.

5) Real GDP Growth in Canada

We project that, after growing only 0.9% at an annualized rate during the first three quarters of 2023, the Canadian economy will remain almost flat between Q3 2023 and Q2 2024, before growth accelerates to 2.9% from Q3 2024 to the end of 2025. On an annual basis, real GDP growth would be 1.1% in 2023, 0.6% in 2024 and 2.9% in 2025. On a Q4/Q4 basis, growth would be 0.8% during 2023, 1.5% during 2024 and 3% during 2025. Slack in the economy would build up until mid-2024, and there would still be a small amount of it left late in 2025.

Table 2.11:

CANADIAN REAL GDP GROWTH				
	2022	2023	2024	2025
Year-on-year growth (%)	3.8	1.1	0.6	2.9
Q4/Q4 % change	2.2	0.8	1.5	3.0

The nearly flat aggregate demand over the following quarters is largely explained by the past tightening of financial conditions and by a sharp projected deceleration of the U.S. economy. The adjustment to higher interest rates mostly takes place through a pronounced slowing of household consumption. Higher interest rates not only raise the cost of credit for purchases of goods and for new residential investment, they also increase debt service payments, notably mortgage costs, prompting households to save more and consume less of their disposable income to meet larger current, or anticipated, debt service obligations. This is important in Canada because a considerable proportion of (low-interest) mortgages are due to be rolled over in the next two years.

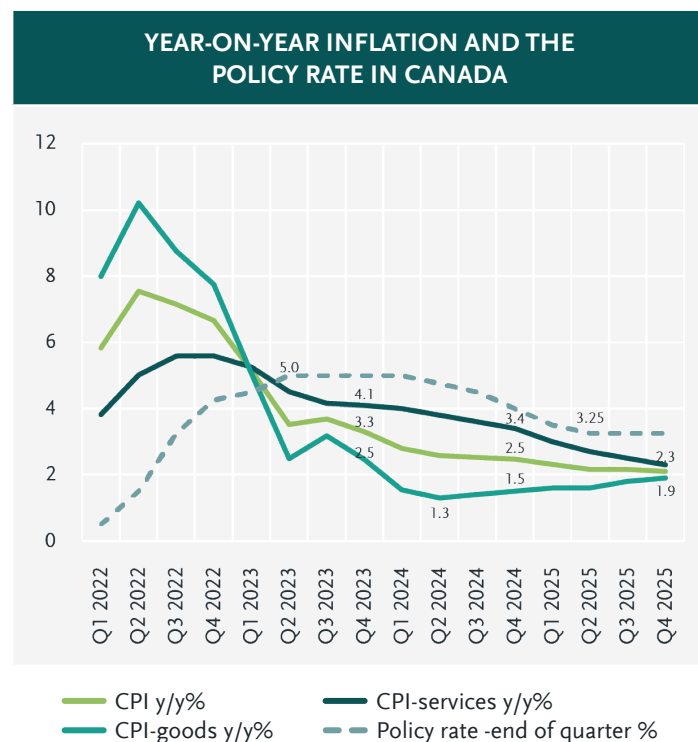
Nevertheless, growth in household consumption and housing firms up going into 2025 as interest rates start to decline by mid-2024 and as real disposable income increases. Likewise, export growth strengthens as foreign demand gains momentum in the second half of 2024 and in 2025. Business non-residential investment also picks up steam as prospects for domestic demand and exports improve, financial conditions ease, and projects to adapt to structural changes and improve competitiveness become more pressing.

6) CPI Inflation in Canada

We subscribe to the headline CPI inflation profile projected by the BoC to 2025 in its October Monetary Policy Report.⁷ Headline CPI inflation declines to 3.3% by Q4 2023, 2.5% by Q4 2024 and 2.1% by Q4 2025. We have estimated profiles for goods price inflation

and services price inflation which are consistent with the headline inflation profile (Chart 2.2). Goods inflation falls to 1.3% by Q2 2024, then edges up to 1.9% by Q4 2025. The fall in services inflation is persistent, to 3.4% by Q4 2024 and 2.3% by Q4 2025.

Chart 2.2:



We see the following factors acting on core and services inflation:

- Excess supply in the economy increases until mid-2024; it does not completely unwind thereafter, thus keeping downward pressure on inflation, albeit with lesser intensity going into 2025.
- Wage rate inflation eases slowly in response to excess supply in the labour market and declining CPI inflation, contributing to a gradual pace of disinflation in non-housing services.
- Corporate pricing normalizes, and any increase in unit costs due to weak productivity or demand is at least partially absorbed by a compression of profit margins.
- Mortgage interest costs contribute to keep core and service inflation elevated and persistent, but as interest rates decline from mid-2024 onwards, they make a diminishing contribution.
- Housing rental markets are expected to remain tight due to high population growth resulting from large net inflows of foreign students, temporary foreign workers and new permanent residents, thereby keeping rent inflation high and persistent.

7) Risks to Growth in Canada

Clearly, there continues to be much uncertainty about future geopolitical developments and their consequences for the world and Canadian economies.

Abstracting from possible external shocks, we judge the risks to our projection of Canadian growth to be roughly balanced. We flag three sources of risk, in particular.

- **U.S. growth:** There are risks on both sides for U.S. growth, a key influence on Canadian performance. U.S. aggregate demand might continue to surprise on the upside, much as it has done in the last year, or it might adjust more brutally than we project to the cumulative tightening of financial conditions, giving rise to more than stagnation or a shallow recession over the best part of 2024 as we project. The U.S. elections in 2024 are a wild card.
- **Canadian household behaviour:** there are risks concerning the extent to which Canadian households will save more and retrench consumption in the next two years in the face of current or expected higher contractual payments once they renew their mortgages at considerably higher rates. We see this as more of a downside risk for our projection.
- **Stickiness of inflation:** There are risks concerning the pace at which inflation will converge on the 2% target. There is a chance that inflation in Canada declines more rapidly than we expect, in which case real incomes would strengthen more and financial conditions would ease earlier, two conditions that could support more growth than



we project. If this were to happen also in the United States, then stronger growth there would reinforce the impact of looser financial conditions in Canada. On the other hand, high core or services inflation could prove stickier than we project, in which case gains in real incomes would be slower, the loosening of financial conditions would be delayed, and growth would be weaker than projected.

Proposed Planning Parameters for Businesses

While uncertainties abound, we consider that our scenario for the U.S. and Canadian economies to the end of 2025 constitutes a reasonable basis for business planning. Under this scenario, the two economies evolve broadly in sync: there is a period of very little growth on average during the four quarters to Q3 2024 in the United States and the three quarters to Q2 2024 in Canada, followed by a period of growth above potential as adjustment to high policy interest rates fades and the global economy strengthens. Inflation is projected to be on a steady downward track, reaching the 2% target by the end of 2025 for all practical purposes. Risks overall are roughly balanced in our view. Businesses must maintain the flexibility to adjust if conditions turn out to be markedly different than anticipated.

Table 2.12:

PLANNING PARAMETERS		
	United States	Canada
GDP GROWTH (Q4/Q4% CHANGE)		
2022	0.7	2.2
2023	2.7	0.8
2024	0.5	1.5
2025	2.1	3.0
HEADLINE CPI (Q4/Q4% CHANGE)		
2022	7.1	6.7
2023	3.2	3.3
2024	2.5	2.5
2025	2.1	2.1
POLICY RATE (%)		
Dec. 22	4.1	4.25
Dec. 23	5.3	5.0
Dec. 24	4.6	4.0
Dec. 25	3.3	3.25
10-YEAR TREASURY YIELD (%)		
Q4 2022	3.8	3.2
Q4 2023	4.6	3.8
Q4 2024	3.7	3.5
Q4 2025	3.5	3.5
WTI OIL PRICE (US\$ PER BARREL)		
2022	95	
2023	78	
2024	75-85	
2025	75-85	

Pursuing Advantage in a Complex World

The outlook for trade and investment is subdued. An ever-more complex international environment, where national security and economic security intersect, wars persist, protectionism and populism are ascendant and fragmentation of trading rules result, poses new challenges to the pursuit of international business. Canadian businesses, supported by governments, can nonetheless grow internationally by building from strengths. Smart investment in innovation and improved productivity—accompanied by agility and perseverance in keeping pace with changes in the global environment—are key elements of success.

The Outlook for Trade and Investment

Modest growth in global international trade and in flows of foreign direct investment are expected in 2024. Globalization is not in full retreat. International trade and investment continue to grow, but they are no longer outpacing and driving growth. The IMF and the World Trade Organization (WTO) are both projecting that the volume of merchandise trade, after growing by less than 1% in 2023, will grow by about 3.5% in 2024, slightly faster than global output.¹ The WTO's outlook highlights “inflation, high interest rates, U.S. dollar appreciation, and geopolitical tensions” as contributing elements. Any increase in demand in major markets is likely to be subdued, and in capital-exporting countries the appetite for new investments and expansion abroad similarly is likely to remain muted. Regionally, North America will likely show better trade performance than Europe, Latin America or Asia, with implications for Canadian business in assessing market prospects in the coming year. Channels and patterns of trade are evolving.

A Complex International Environment

Aside from cyclical factors, a set of global developments and trends are creating a complex and uncertain environment for international business in the medium term. The pursuit of international opportunity must be responsive to these new realities.

- Western–China tensions are likely to continue.** As is now largely recognized, the pursuits of economic prosperity and national security are intertwined. Despite a more cordial tone struck by Presidents Biden and Xi at their bilateral summit on the margins of APEC in November, concern is growing that China is more aggressively pursuing foreign goods and technology for military ends. It continues to expand state oversight and control of private sector activities, despite recent claims by leadership that it welcomes foreign investment. China's ambition to upgrade its semiconductor chip capacity has led to Western technology export restrictions, and the United States has issued an executive order subjecting outward investment to China in related sectors to mandatory review and approval procedures. China in return continues to selectively weaponize its own export controls to the detriment of key sectors abroad; in October 2023 it announced that starting in December, export permits will be required for synthetic graphite material, including high-purity, high-strength and high-density versions as well as for natural flake. Graphite is a key component in the production of electric vehicle batteries, and China dominates its worldwide production and processing. Further, building on a succession of data security and cybersecurity measures passed in recent years, last spring China adopted a wide-ranging update to its anti-espionage legislation, banning the transfer of information related to national security and broadening the definition of spying. Raids on foreign auditing and management consulting firms have followed. Investors have



become more cautious as a result. Some of the large Canadian pension plans are reported to have paused private equity investments in the country.² On the other hand, U.S., Canadian and EU trade with China is still growing, albeit at a reduced pace recently, reflecting the slowdown of China's economy since the second quarter of 2023.³

- **Wars will remain a feature of the international landscape.** The war in Ukraine is likely to continue for some time, with ongoing consequences for oil and gas markets, particularly in Western Europe, as well as grains, potash and a range of minerals from Russia now subject to sanctions. Both supplies and prices are thus facing continued volatility. The war in Gaza, in addition to its human toll and refugee crisis, is destabilizing economic relations in the region, again with implications in the energy sector,⁴ and under pessimistic scenarios, putting maritime transport through the Suez Canal at risk. Disruptions in global shipping, and thus in supply chains more broadly, cannot be discounted, as business learned in March 2021 when the “Ever Given” container ship remained stuck in the canal for three months: it was reported that \$US9.6 billion in trade was held up each day during that period and that shipping costs from Asia to the Middle East jumped by over 40%.⁵
- **Supply chains are shifting.** There is an active debate and inconclusive data about whether reduced growth in international trade is in part a result of a structural shift, as firms have prioritized resilience over efficiency by aiming to make their supply chains more localized. A detailed study by the Bank for International Settlements concludes that in fact many supply chains have lengthened, particularly in Asia, where intermediate goods are increasingly integrated with Chinese-origin production en route to export markets.⁶ The reality of the reshuffling of supply chains will challenge business planning, requiring firm-level decisions on reshoring, nearshoring and third-country intermediation, taking into account a range of costs and risks.
- **Politics, protectionism and industrial policy are pervasive.** Prominent examples are the U.S. *Inflation Reduction Act* and the *Chips and Science Act*, analogous EU measures, and efforts by Canada, Japan and others to match incentives. With national elections in the offing in 2024 in the United States, Mexico, India, Indonesia and Taiwan, and EU parliamentary elections in June, among others, pressures for measures to favour domestic firms and workers can be expected.
 - Of note is the fact that the Canada–U.S.–Mexico Agreement (CUSMA or USMCA) includes a provision for “review and term extension,” known as the “sunset provision,” establishing that all three nations must convene every six years to confirm their ongoing interest in keeping the treaty in force. The first such review will occur in 2026. Current and simmering disputes concerning actions or proposed measures, and failure to abide by clear rules or dispute settlement rulings by one or another country are raising concerns in business and government circles and could become political issues in elections between now and the formal review, potentially inviting calls for renegotiation. Examples include Mexican energy and agricultural regulation, alleged Canadian non-implementation of a decision on dairy tariff-rate quotas, the U.S. failure to implement a panel ruling on applying proper automotive rules of origin, and Canada's potential implementation of a digital services tax, depending on discussions with OECD partners on a multilaterally agreed approach.
- **Standards and rules for the movement and management of data are evolving.** The emergence and rapid deployment of AI, as discussed in Chapter 5, create a new impetus to work towards common standards across borders on data flows that facilitate commerce, on the one hand, and provide adequate protection of personal information, on the other hand. While there

are some provisions in the CUSMA and in the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), there are as yet no globally agreed codes. However, a majority of WTO members continue efforts to forge an agreement on electronic commerce; the Digital Economy Partnership Agreement is an expanding “club” of countries committed to high standards; the EU and Japan reached a bilateral agreement in October on cross-border data flows; and the U.S. and EU continue discussions to resolve their differences.

- **Climate and social accountability are increasingly becoming regulatory requirements, as a range of standards and reporting requirements regarding climate-related risks have come to the fore.**

In Canada, the Office of the Superintendent of Financial Institutions (OSFI) has set out requirements for banks and insurance companies to disclose climate-related risks through annual reporting, starting in fiscal year 2024 for larger institutions and in 2025 for smaller ones.⁷ Financial institutions in turn will require information from their clients. More broadly, in June 2023 the International Sustainability Standards Board (ISSB) released its inaugural standards-setting requirements for sustainability-related (IFRS S1) and climate-related (IFRS S2) financial disclosures (ISSB Standards).⁸ The Canadian Securities Administrators are consulting on making these reporting requirements mandatory for publicly traded firms.⁹ In the Fall Economic Statement, the federal government announced an intent to develop options for making climate disclosures mandatory for private

companies in consultation with the private sector and independent experts, but no timeline was specified. Abroad, under its carbon border adjustment mechanism or CBAM, the EU now requires importers of certain carbon-intensive products—specifically, iron and steel, aluminium, fertilizer, cement, electricity and hydrogen—to declare greenhouse gas emissions (GHGs) embedded in their imports and, as of 2026, pay import taxes that mirror the domestic EU carbon price. A joint study undertaken by the OECD and the World Economic Forum published in November 2023 highlights that more discussions are needed involving governments, businesses and other stakeholders to standardize approaches.¹⁰

Social dimensions of business are also increasingly becoming subject to accountability and reporting requirements. Canada’s *Fighting Against Forced Labour and Child Labour in Supply Chains Act*, described in detail in Box 3.1, the U.S. *Uyghur Forced Labor Prevention Act*, which since 2021 has authorized customs seizure of offending goods, and the expansion on the same date of Germany’s *Supply Chain Due Diligence Act*, alongside analogous Dutch and EU-wide measures, increase the onus on firms to know their suppliers and their environmental and social practices while adding to reporting requirements. The Canadian Ombudsperson for Responsible Enterprises, created in 2019, is authorized to review complaints about possible human rights abuses by Canadian companies when those companies work outside of Canada in the garment, mining, and oil and gas sectors.¹¹



Box 3.1

CANADA'S SUPPLY CHAINS ACT

On May 11, 2023, the *Fighting Against Forced Labour and Child Labour in Supply Chains Act* (the “Act”) received Royal Assent.¹² The Act requires many government institutions¹³ and certain companies and organizations to publicly report to the Minister of Public Safety and Emergency Preparedness on the steps they take to prevent or mitigate the risk of forced labour or child labour in their supply chains. Reports must be signed off on by the governing body of the organization, and there is director and officer liability for non-compliance or for false or misleading statements. At present, the Act is scheduled to come into force on January 1, 2024, with the first reports due by May 31, 2024.

The new reporting obligations are mandatory for government institutions that produce, purchase or distribute goods in Canada, as well as for companies or organizations that meet the definition of an “entity” and that produce, sell or distribute goods in Canada or elsewhere, that import into Canada goods produced elsewhere, or that control another “entity” that does any of these things.

Public companies are “entities” as are any corporations, trusts, partnerships or other unincorporated organizations that (i) have a sufficient nexus to Canada and (ii) meet certain size thresholds set out in the Act. A Canadian nexus is established by having a place of business in Canada, doing business in Canada or having assets in Canada. The size thresholds (based on the organization’s last two years of consolidated financial statements) are determined by whether

organizations—worldwide, not just in Canada—meet two of the following three criteria: (i) \$20 million in assets; (ii) \$40 million in revenue; or (iii) on average 250 employees.

Reports filed by entities must be approved and attested to by their governing bodies. Entities may provide an individual report or a joint report with more than one entity.¹⁴ The annual reports must be filed by May 31 of each year, with the first deadline currently scheduled to fall on May 31, 2024. The report must be sent to the Minister and be made available to the public, including by placing it in a prominent place on the entity’s or government institution’s website.¹⁵

Failure to comply with obligations under the Act may constitute an offence punishable on summary conviction and liable to a fine of up to \$250,000. Knowingly making any false or misleading statements or providing false or misleading information is also an offence. The Act establishes personal liability for directors and officers, among others, who direct, authorize, assent to, acquiesce to or participate in a commission of an offence under the Act.

Companies should therefore ensure that the proper governance structures are in place to identify and mitigate risks, including with respect to forced labour and child labour. Companies that meet the reporting entity thresholds described above should review their supply chain due diligence and monitoring practices now, in anticipation of the reporting requirements expected to begin in May 2024.

- **Spaghetti and noodle bowls characterize a fragmented international trading system.** The patchwork of bilateral, regional and plurilateral agreements, with varying tariff levels, differing standards disciplines, divergences in coverage of services and investment obligations, alongside a growing number of *ad hoc* clubs and coalitions in various sectors, for example regarding critical minerals and “green steel” seeking to steer trade among like-minded countries, remain a dominant characteristic of the global trading environment. As such agreements and arrangements continue to grow in number, increasing complexities and inefficiencies with higher trade costs result. While efforts continue among senior officials and Ministers alike to agree on an agenda for needed WTO reforms, including restoring an effective dispute settlement mechanism, expectations remain modest for the WTO’s 13th Ministerial Conference (MC13), which is to take place from February 26 to 29, 2024, in Abu Dhabi.

Opportunities to Build on Canada’s Strengths

Despite the challenging context set out above, there are significant opportunities for Canadian businesses—supported by governments—to build from strength. With agility and perseverance, and a strategic approach to investing in such opportunities, firms in various sectors stand to reap rewards. Three examples serve to illustrate both the challenges and the opportunities.

1. The Energy Transition

Canada can play a meaningful role both at home and abroad in the global transition to a lower-emitting and ultimately net-zero economy.

The transition will require sustained, massive investment in the energy system, upstream and downstream, as well as a reconfiguration of supply chains, over the next decades. Upstream, the necessary investments comprise cleaner fossil fuels,

electrification, renewable energies, hydrogen and nuclear (large and small modular). Downstream, the transition requires the transformation of energy use, including fuel switching and energy efficiency, in industry, buildings and transportation. Given the limits to the abatement of emissions, carbon capture, utilization, and sequestration (CCUS) and direct capture technologies will play a significant role. In its most recent net-zero scenario for 2050, the IEA estimates that global investment in clean energy must grow from US\$1.8 trillion in 2023 to \$4.5 trillion annually by 2030.¹⁶ Similarly, the International Renewable Energy Agency (IRENA) estimates that limiting the average increase in global temperatures to 1.5°C will require investments of over US\$5 trillion annually across energy transition technologies through to 2050.¹⁷ The necessary investment in materials for a clean economy, including critical minerals, will also be massive. While most of the additional capital is expected to come from the private sector, public financing is required to catalyze private finance. Advances in technology, and supporting policies, will be instrumental.

An orderly transition entails a progressive shift of global supply and demand, and to the greatest extent, a trading environment that enables economies to draw on the best available resources, materials and technologies. For example, the IEA notes that “sequencing the decline of fossil fuel supply investment and the increase in clean energy investment is vital if damaging price spikes or supply gluts are to be avoided.” Investment in the development of technologies will be greatest, deployment fastest, and impacts on emissions most effective if there is access to larger markets. No national or even regional economy can succeed alone in the energy transition.

Canada can capitalize on its capacity through the transition to be a reliable exporter of responsibly sourced hydrocarbons and over time pivot to exporting more clean energy commodities, technology and services. Global demand for oil has not peaked.



When it does, it will diminish gradually, and even in a net-zero future there will be demand for the petrochemical industry. Meanwhile, there is opportunity beyond projects already on stream to export liquified natural gas (LNG), notably to Asian markets, to assist with the replacement of coal. Exports of energy products generated revenue of \$212 billion for Canada in 2022. This is a critical contribution to our trade balance and economy that must be preserved, potentially enhanced in the medium term, and over a long period replaced to enable Canada to finance and to implement its own energy transition. Opportunities in a clean economy include not only clean energy sources such as green or blue hydrogen, but also, as discussed in Chapter 5, technologies and services as we develop new capacities in domains such as hydrogen, CCUS, nuclear energy and other clean technologies. As projects are developed, Canada can serve a rapidly growing market for critical minerals.

Canada has demonstrated potential in clean technologies, attracting domestic and foreign investment.¹⁸ According to Export Development Canada, cleantech already accounts for nearly \$10 billion in exports, of which 50% are complex manufactured goods.¹⁹ Federal government policies are supportive and are paralleled by various provincial initiatives. Commentators and analysts alike have underscored the importance of catalyzing additional investment, with particular attention to be paid to supporting leading-edge firms and technologies at the commercialization stage.²⁰

2. The Digital Ecosystem

Digitalization and the emergence of AI are transforming business models, with a capacity for rapid international deployment through networks, the cloud and data. The multiple dimensions of this impact are the subject of many books and articles, conferences and debates in and beyond governments, and are not within the scope of this report. On the positive side, the technology is fostering a universe

of new and enhanced private and public services for businesses and consumers. “Big data” is growing in importance, as the cloud becomes the dominant information technology platform, AI speeds analytics, modelling and scenario planning, and the convergence of technologies enables rapid innovation and production (e.g., real-time problem-solving, 3-D printing, optimized logistics). Social benefits can include improvements in the science and delivery of health care, better access to education, and financial inclusion. Risks are pervasive, however, including threats to privacy and security, ransomware extortion, mobile malware, “Zero-Day” vulnerabilities, and global attacks on business.

Cross-border trade in the underlying technologies and services is subject to a distinct set of rules that, as per the review in this chapter, is evolving as jurisdictions around the world assess potential benefits and risks, and their interests. The digital economy is largely “dematerialized”: as discussed in Chapter 5, value and market advantage are founded on innovation and on the creation and commercialization of mostly intangible assets such as IP and data.

Canada must build on its world-class human capital, institutions and vibrant “ecosystem” of digital enterprises to monetize, through global trade, the value of its innovations and services. Clearly, U.S. big tech firms have established dominant positions in the digital marketplace. Nonetheless, the market is an exceptionally dynamic one, and the potential to create new value through innovative technologies and applications is immense. Canada has strong assets. For example, it is home to one of the world’s largest cybersecurity innovation hubs and it claims global leadership in preparedness for cyber-attacks, supported by a national cybersecurity strategy and the Cyber Security Innovation Network.²¹ Its universities and research hubs through to start-up firms focused on AI reflect a growing capacity in science, research and talent, supported by the active promotion of responsible use.²²

Public and private sector collaboration is required to realize Canada’s potential and to position our firms for success in the global digital economy. The Information and Communications Technology (ICT) Council emphasizes the importance of enhancing R&D investments, reversing a risk-averse business culture towards global markets and boosting commercialization and market access, especially under Canada’s preferential trade agreements.²³ We review added conditions of success in Chapter 5.

3. Agri-food and Food Security

“Climate change, COVID-19, and the war in Ukraine are just some of the crises that have exposed an unfortunate new reality—our global food supply is perilously insecure. Russia’s illegal invasion of Ukraine, whose food exports directly and indirectly impact almost two billion people, has impacted many in the poorest countries. Inflation that has been attributed to the war and to supply chain disruptions hasn’t helped. Climate change and the resulting impacts on extreme weather patterns of drought, flooding, forest fires, water shortages and unprecedented temperature conditions have impacted agriculture and growth across more and more of the world. And yet, this crisis—per the eternal aphorism—also presents an opportunity for Canada to take its place as a global food superpower.”

Charles McMillan, *Policy Magazine*, January 23, 2023

Canada has natural strengths and world-leading expertise in agriculture and agri-food. We are the fifth-largest exporter of agri-food and seafood in the world, behind only the EU-27 block of countries, the U.S., Brazil and China.²⁴ Internationally, Canada is a leading voice for improving agricultural productivity and sustainability in developing countries, and it continues to make major contributions, beyond humanitarian aid, to support this effort.²⁵

Under the auspices of the federal-government-led Protein Cluster²⁶ and the industry-led Protein Industries Canada,²⁷ several Canadian firms are finding opportunities to innovate and enhance sustainability and value added to production and thus to sales at home and abroad. An example of the benefits of such collaboration is Soileos, a sustainable, non-polluting, climate-positive micronutrient fertilizer created from the upcycling of pea, lentil and oat hulls—co-products from food processing. The use of Soileos increases crop yields and improves the health of soil while also increasing revenues for both farmers and food processors.²⁸

To realize global opportunity, sustained effort is needed to expand infrastructure and supply capacity, boost innovation and grow value added. As demonstrated by successes to date, investment in productivity-enhancing R&D and in the pursuit of export opportunities will deliver dividends for our firms while contributing to our trade performance and to the growth of incomes for Canadians.



Some Guideposts

The foregoing analysis makes clear that, despite a muted global outlook in the short term and the complexities of the international conjuncture, opportunities exist for Canadian businesses to position themselves on the winning side of change by building from strength. While the world is complex, Canada has trade agreements with economies representing 60% of global GDP that still provide, as a starting point, predictable rules of access to markets.

Capitalizing on opportunity requires:

- 1. Staying agile.** Staying alert to, and anticipating, changes in the global environment, with a view to identifying key export markets, to ensuring continuing access to essential inputs, equipment, parts and services, and, importantly, to maintaining engagement with governments on such key issues as regulatory reform, from supply chains to AI.²⁹
- 2. Investing.** Accelerating innovation and productivity growth and enhancing the offer of goods and services that the world will want to buy through such transformations as the energy transition and digitalization.
- 3. Sustaining engagement.** Persevering and building and sustaining relationships with potential customers, buyers, partners and investors.
- 4. Collaborating.** Engaging with governments and research centres to take full advantage of funding and support for investment, R&D and innovation, with Export Development Canada for export financing and insurance and with trade commissioners abroad to gather intelligence and to get advice and support on the ground for building relationships and markets.

The Labour Market: Wages, Immigration and the Impacts of AI

Like the wider economy, the labour market is adjusting to short-term developments in output and prices and to longer-term structural factors, notably demography and technology.

Since 2021, a tight labour market and higher CPI inflation have led to rising wage pressures. Since the first quarter of 2023, wage inflation has exceeded CPI inflation such that there are real wage increases and thus a recovery of earlier losses of purchasing power for workers. Wage settlements in collective bargaining are still catching up to inflation because of the fixed term of the agreements. While wages may be expected for some time to rise faster than the CPI, there is no indication of a wage-price spiral as excess demand for labour, inflation, and inflation expectations are falling, lessening future pressure on wages.

Immigration is now the source of virtually all net growth in the labour force. Canada has raised its intake of immigrants. It has also allowed sharp increases in the temporary worker and international student populations. Unfortunately, in doing so the government has also shifted policy such that more immigrants and temporary workers are selected to close labour market gaps, including in lower-wage and lower skilled occupations, than to raise the skills and productivity of our workforce. This boosts growth in the short term, but not GDP per capita, nor our competitiveness.

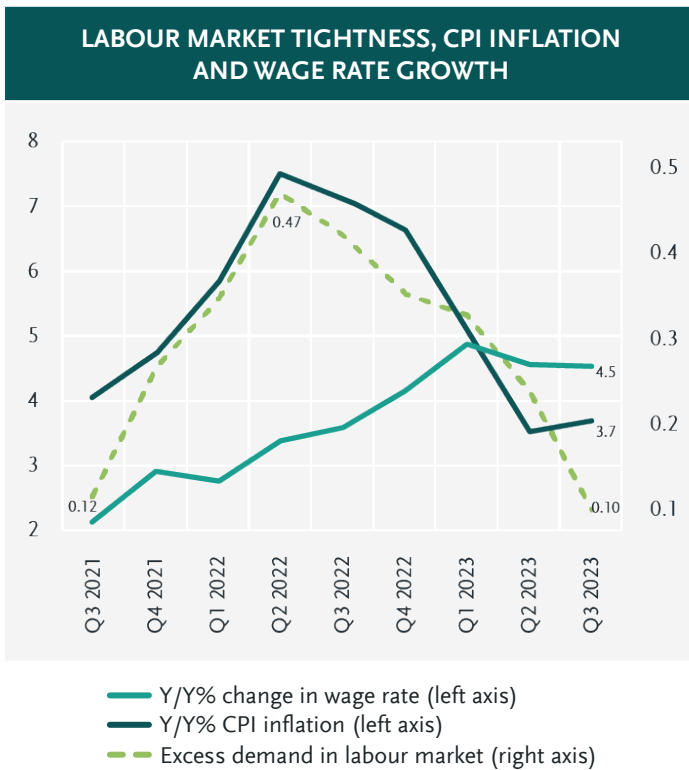
Finally, generative AI, as a general-purpose technology, will no doubt enhance the productivity of the labour force, and it may offer a partial solution to labour shortages. Although the timing of the full impact of AI is uncertain, there will be major shifts in jobs, including job losses. It is incumbent upon governments and the business community to address the reskilling and upskilling of workers to realize the benefits and mitigate the costs and risks of generative AI for workers.

Recent Wage Developments and Prospects¹

Since 2021, wage inflation has been consistent with a lagged response to CPI inflation and to excess demand in the labour market; year-on-year real wage growth turned positive and averaged 1% over Q2 and Q3 2023. Excess demand in the labour market emerged in Q3 2021 and peaked in Q2 2022.² It steadily diminished thereafter to almost disappear by Q3 2023. Similarly, CPI inflation accelerated in 2021, peaked in Q2 2022 and then trended down. Wage inflation, while also rising, lagged CPI inflation through most of the period. It peaked at 4.9% in Q1 2023 and since then has exceeded CPI inflation. By Q3 2023, wage inflation was 4.5%.



Chart 4.1:



Sources: Statistics Canada tables 14-10-0063-01, 14-10-0287-01, 18-10-0004-01.

The lagged response of wage inflation reflects the fact that wage adjustment is less frequent than price adjustment and changes in labour market conditions, with wages being set at a fixed level between adjustments. The interval for wage change is usually four quarters or 12 months, whereas for items in the CPI it may average around four months based on past evidence in the United States.³

Wage inflation in the recent past has been affected not only by CPI inflation and labour market tightness but also by other factors, including statutory minimum wage increases in several provinces. Higher minimum wages have boosted wage growth in sectors like restaurants, accommodation and retail trade. On the other hand, collective agreements spanning several years have held back wage growth in health care, public administration and educational services.

As tightness in the labour market eases, and as inflation and inflation expectations diminish, the rate of wage growth will trend downward; real wages will continue to appreciate, but we believe prospects of a wage-price spiral are low. The recent levels of wage rate increases, if sustained, would not be compatible with the inflation target. Wage inflation will moderate as aggregate supply and demand in the economy adjust. Additionally, we expect the mark-up of prices over wages to be compressed as the economy slows and as short-term inflation expectations abate, both making it harder for firms to pass on higher labour costs to consumers.

This said, there is uncertainty and a range of possible scenarios, as informed by a wide band of wage increases in recent collective bargaining agreements. On average, wage increases in settlements this year appear consistent with worker attempts to catch up with past inflation, and with expectations that inflation will be lower going forward. From May to September, settlements were 6.1% for the first year and 4.4% for the duration of 2–4 year contracts—much higher than the inflation target but directionally consistent with a process of adjustment to high and then lowering inflation.⁴ Some high-profile settlements have been at the high end of a wide range. For example, Stellantis workers secured a wage increase of more than 15% over three years. Similarly, longshore workers at British Columbia ports negotiated wage increases of 18% over four years. By contrast, some university and regional government workers earned annual increases in the 2–3.5% range only. Collective agreements in any period cover only a small proportion of the labour force, and any conclusions about future aggregate wage adjustments must be drawn with caution.

Immigration, Labour Supply, and Worker Skills and Productivity

Canada’s demographic trends show us that more older workers today are retiring than younger Canadians are entering the labour force, such that virtually all net labour force growth comes from immigration. The retiring and ageing of the baby boom generation are

not only reducing the labour force, they are raising the dependency ratio—that is, there is a diminishing proportion of workers in the total population. In this context, immigration, and the composition of immigration, are important factors in adjustment to sustain and grow standards of living.⁵

In response, Canada has undertaken to augment sharply the intake of both permanent residents and temporary workers. In addition, Canada has allowed a large increase in the number of international students who do not enter the country for the stated purpose of employment, but who are nevertheless allowed to work while studying.

The composition of immigrants and temporary workers is important for the performance of the economy based on what may be cast as two complementary but also potentially competing objectives of economic immigration.

- **First, improving the skill base of the workforce.** The end game in this case is to contribute, now and over time, to stronger productivity, more innovation and higher income per capita. It is accomplished by bringing individuals with strong skill sets that will be able over time to respond and to adapt to changing labour market conditions. This is the objective that historically has anchored our economic immigration program.
- **Second, helping to close gaps in a tight labour market.** This typically entails the selection of workers to address an immediate shortage, in some cases in highly skilled occupations, such as informational technology (e.g., programmers), but equally in lower skilled ones such as in personal services, homecare, and food and accommodation. Many recent programs and initiatives appear to be principally serving this objective.

Our review of recent policy trends shows that Canada has tilted the balance towards the second objective at the expense of the first, diminishing the potential contribution of immigration to our long-term economic performance.

This chapter sets aside the question of whether the recent and planned intakes of immigrants and temporary workers (and foreign students) are aligned with the absorptive capacity of our economy and social infrastructure—another important and complex policy question. It focuses on the paths and criteria for the selection of economic immigrants, and the impact on productivity, without reference to the proportion of total immigration (including dependents of economic migrants) that in fact adds to our labour force.

The Evolution of Programs for Temporary Workers and Permanent Residents

1. Temporary Workers

Approximately 606,000 temporary workers came to Canada in 2022, under two principal programs.⁶

The classic temporary foreign worker (TFW) enters Canada for 3–6 months in response to a seasonal demand for labour. At the end of the term, the worker returns to the country of origin. The employers must show through labour market surveys that there is not a sufficient domestic supply of labour. The TFW program admitted over 136,000 workers in 2022, close to double the amount in 2015.

In recent years, the largest growth in the temporary worker class is attributable to the International Mobility Program (IMP), which has multiple streams and then a bridge to permanent residency. In 2022, the program admitted over 470,000 workers, up from about 176,000 in 2015. There is no cap or target for the IMP, the employer does not have to show a labour market shortage, and in most instances there is an offer of employment prior to entry. Although the IMP was initially conceived as a temporary work experience, in 2022 over 97,000 IMP workers transitioned to permanent residency.⁷

Most of the IMP workers are medium to higher skilled workers, but there is also a significant intake of lower skilled workers.⁸ The most common jobs include computer programmers, interactive media



developers, software engineers, information systems analysts, university lecturers and specialist physicians. To a lesser extent, the IMP also attracts lower skilled workers such as truck drivers, cooks and food service supervisors.

In sum, the IMP worker program has allowed the rapid entry of temporary workers of varying skills based on employer demand. It has enabled employers to meet chronic rather than seasonal or temporary shortages. In doing so, it may also have kept wages lower than they would have been absent the program, and reduced the incentive for employers to invest in physical capital, skills and innovation to enhance productivity.

2. International Students

Canada admitted 550,000 new international students in 2022.⁹

Increasingly, students come to Canada as a step to permanent residency. While only 6% of all new permanent residents had studied in Canada in 2000, that figure was 38% by 2019. Almost 60% of graduate-level students achieve permanent residency within 10 years of arrival.¹⁰

As with the growth of the IMP, the increase in the number of international students, and their easier access to permanent residence, are not, in and of themselves, problematic, particularly if the shift is aligned with the goal of building a well-educated, productive workforce. Colleges and universities depend on international student tuition revenue because of shortfalls in funding from provinces as well as constraints on tuition fees for domestic students.

However, there are three problems emerging with recent trends.

- **First, foreign students are allowed to work during their studies, and typically this is in low-skill, low-wage occupations,** for example in the accommodation and food services sector. Since 2022, there has been no limit on the number of hours of work of these students.

- **Second, there is no restriction on the kinds of courses that can be taken by international students.** To the extent that enrollment creates a streamlined pathway to permanent residency, depending on the program of study, there can be greater or lesser contributions to the agile, highly skilled workforce that Canada should be seeking.
- **Third, the international student experience is rife with abuse, diminishing the credibility of the system.** As highlighted in a recent report from four senators, there are instances of falsification of academic credentials, high fees charged by education consultants, and false advertising by colleges regarding the impact of a student visa on eligibility for permanent residency.¹¹ In response, the Government of Canada announced on October 27, 2023, that it intends to redress some of these shortcomings as well as create a “designated institution” program to better control where students study.¹² The commitments are welcome, but it will likely take some time for them to be implemented.

3. Permanent Residents

Canada welcomed 437,000 immigrants in 2022.¹³ It targeted 465,000 in 2023. Going forward, the federal targets for new permanent residents are 485,000 in 2024, and 500,000 in each of 2025 and 2026.¹⁴

The process of selection of permanent residents has shifted over time from one driven consistently by an objective assessment of education and skills to one responding to a diversity of needs and pressures; the result is a higher proportion of lower skilled permanent residents.

Again, a number of policy decisions have contributed to this shift:

- **The proportion of permanent residents accepted under the Federal Skilled Worker Program (FSWP) has continuously declined.** The FSWP began in 1967. It was one of the first programs in the world to assess individual applications for permanent residency based on education and skills, including linguistic ability and “adaptability” (how well

workers would likely settle in Canada), as captured together under a points system, applied universally and consistently. By 2022, however, FSWP entrants accounted for only 15% of male and 22% of female economic class permanent residents.

- Conversely, Canada has continuously expanded the Provincial Nominee Program (PNP), which is a vehicle by which provinces can select permanent immigrants based on regional needs.** In 2022, the PNP accounted for 43% of male and 39% of female economic class permanent residents.¹⁵ In the early days of this program, applicants were usually lower skilled workers who were often spouses or dependents and who, as a family unit, were prepared to reside outside of major metropolitan areas. Today, the applicants are mostly young, principal workers who have Canadian work experience obtained as temporary foreign workers. While the overall skill level of PNP applicants has risen over time, these immigrants are nevertheless less skilled, on average, than those who are admitted under the FSWP.
- More recently, the Government of Canada launched a new “category-based selection process” with the stated goal of assisting employers in filling vacant positions across the country.** The announcement of May 31, 2023, states that “category-based selection will make Express Entry more responsive to Canada’s changing economic and labour market needs, while building on the high human capital approach that has been a hallmark of Canada’s successful economic immigration system.”¹⁶ The stated intent is defensible, but what matters most is how the program will be implemented. The criteria at the outset include work experience in healthcare; STEM professions; trades, such as carpenters, plumbers and contractors; transport; and agriculture and agri-food. The program also seeks workers with French language proficiency. While this will be consistent in some cases with the objective to build a highly skilled workforce, the new approach also opens the door to workers who will fill low-skilled jobs.¹⁷

Finding the Right Balance in Attracting Immigrants and Workers to Canada

The shifts in policy and programs reflect a responsiveness to evolving economic conditions but also a tilting of balance away from what should be an overriding objective of building a highly skilled, productive workforce for the long term.

Some of the changes have aimed to correct for the fact that historically some highly skilled workers admitted to Canada did not find work in their field of expertise. Many, at least initially, were unemployed or worked in a lower skilled job.¹⁹ This outcome was the result of a combination of factors including regulatory, financial and language barriers.¹⁷ Rather than responding to these barriers head on, Canada now favours newcomers who can immediately find work, even if that work is less skilled, lower paid and less likely to help enhance productivity.

However, transforming the programs increasingly to meet labour shortages in specific sectors, occupations or regions can create chronic dependency, depress wages, disincentivize productivity-enhancing investment and slow down structural adjustment in the economy. In Canada, job vacancies are currently highest in health care, accommodation and food services, and retail trade. Closing large gaps in the latter two sectors will not help build a more productive economy, even less so if there is a path to permanent residence.

Striking the right balance is a delicate matter, not only economically, but also politically, including to sustain public support for immigration. Canada has a reputation as a country that is welcoming of immigrants and that can attract highly skilled workers and their families. This is an important asset that should be leveraged and that should not be compromised by too high an intake of lower skilled workers that will not be able to make the same contribution to the economy.



Generative AI and Its Prospective Impacts on the Labour Market

The impact of AI on the economy and the labour market became a top-of-mind issue in 2023 as the world witnessed the extraordinary potential of the technology as revealed by the launch in November 2022 of ChatGPT.

There is little doubt that given a capacity to perform functions that normally are performed by humans, including skilled, white-collar workers, AI has the potential to generate labour productivity gains, accelerate structural change and disrupt labour markets. In Canada, the Centre for Future Skills estimates that 40% of jobs are at medium risk and 20% at high risk.²⁰ McKinsey estimates a potential to automate work activities that absorb 60% to 70% of employees' time.²¹ Goldman Sachs, reviewing 900 occupations, expects that some two-thirds of jobs could be affected, with 25–50% of their workload replaced by the technology.²² The OECD has also commented on the potential for the technology to profoundly disrupt the workplace.

“Progress in AI has been such that, in some areas, its output has become indistinguishable from that of humans. These rapid developments, combined with the falling costs of producing and adopting these new technologies, suggest that OECD economies may be on the cusp of an AI revolution which could fundamentally change the workplace.”²³

OECD

It is far less certain how fast the impact will be felt and what the *net* impact will be on employment.

1. How Fast the Change?

History demonstrates that impacts of technological advances—in particular productivity gains—are felt with a lag, but lags have shortened with each wave of major technological innovation, and in the case of AI, the lag could again be shorter. ICT was largely developed in the 1950 and 60s, commercialized in the 1970 and 80s, and gave rise to productivity gains most noticeable in the 1990s and early 2000s. This evolution was faster than experienced previously with electricity or the steam engine railway. ChatGPT went live in November 2022; within two months, it had 100 million users, prompting the quick launch of competitor services. The technology is improving quickly, as is its commercialization. Moreover, there is typically no need for large physical infrastructure investment for AI to be deployed.²⁴

Yet, to be realized, productivity gains require on the part of firms across the economy investments in innovation, skills and data management, as well as responsiveness to new opportunities created by the technology. To effectively use AI, businesses have to reconfigure business processes, invest in the collection, acquisition and management of data, and reskill their workforce. These changes will impose short-term costs, particularly for larger firms with legacy systems. Progress will not be linear. There will be trial and error, and ongoing adjustment.

Lags will also be a function of government policies that may accelerate, or slow down, the development and diffusion of the technology. As discussed in both Chapters 3 and 5, the major economies are still in the early stages of developing policy and regulation for AI and determining the right measures to promote innovation, manage the downside risks of AI for the economy, national security and democracy, and to promote their national interests in a global market.

There is legislation in Parliament (C-27) purporting to create a regulatory framework for Canada. The legislation is advancing slowly, and it is the subject of intense debate. To realize the full potential of the technology, there will need to be a clear legal framework, domestically and internationally.

Last, AI is an enabling technology that requires companion innovation in fields of applications for productivity gains and the creation of value.²⁵ AI can provide solutions faster, but the problem statement still must be framed. For example, health care experts have to frame the research required or factors to be analyzed through AI to improve medical diagnostics or treatment. Companion innovation can amplify the impact of AI or delay its realization.

2. What Net Change on Jobs?

Governments, businesses and labour do not appear to have focused yet on the risk of “technological unemployment,” a phrase coined in the 1930s by John Maynard Keynes who explained it as a “temporary phase of maladjustment.” There are many possible reasons. First, as observed by the OECD, there is not yet evidence of large job losses.²⁶ Second, there has been experience through the past decades and indeed centuries of economies transitioning to higher paid work through technological advances. Finally, in a period of demographic ageing and labour shortages, concern about potential job losses is lessened. There are exceptions, however. How AI would be used by employers was a key issue in the recently resolved U.S. Writers Guild strike. The new contract stipulates that AI cannot be used by studios to write or rewrite scripts, and AI-generated writing cannot be considered source material. Writers can choose to use AI if they so desire, but a company cannot mandate that they use certain AI tools while working on a production.

However, policy and business planning must be alert to profound changes in the economy and the workplace that, absent timely adjustment, could lead to large losses of jobs through a period of transition. It is estimated that 300 million jobs could be lost or altered globally because of AI.²⁷ There is a consensus that AI, unlike earlier technological innovation, will impact mostly white-collar and higher-paying jobs. The jobs most exposed include high-skilled work such as office and administrative, legal, architecture, business and financing. As well, coding, software design and other technology jobs are at risk, along with creative jobs in media and marketing that require research and writing skills. A recent study suggests that in the United States workers most exposed last year earned \$33 per hour on average, while jobs with the least amount of exposure earned \$20 per hour.²⁸ AI can affect not only total jobs, but also, critically, the structure of the labour market.

Jobs and competitiveness will best be preserved and enhanced if there is investment in the skilling and reskilling of the workforce such that AI augments work, rather than simply replacing it. The use of bots instead of call centres is an example of job replacement, whereas facilitating legal research and drafting is an example of job assistance that, applied successfully by trained workers, can enhance value. In both instances, there are gains in productivity, but the latter model holds the greatest promise of delivering widely shared benefits and lifting standards of living.

Governments, businesses and labour would be well advised to work together on strategies to leverage the potential of the technology such that it may deliver the greatest shared benefits. If seen by employers strictly as an opportunity to cut costs, the benefits may be small and short-lived. Similarly, if resisted by workers because of the risk of job losses, opportunity will be foregone.

Technology and Structural Change: Finding Our Stride in a Global Race

Canada's economy and its standing in the world in the next decades will depend on how well public and private sector leadership drives innovation.

At the heart of the transformation of the economy globally is technology. Digitalization has permeated all parts of the economy. It is propelled further by generative AI. Technology is also shaping the paths and the costs of the energy transition.

In a period of geostrategic rivalry between the U.S. and China, technology—from semiconductors and AI to clean technology and electric vehicle (EV) supply chains—is a battlefield for economic and strategic advantage. Developing, deploying, commercializing and regulating technology is a critical enterprise, not only for the two superpowers, but for all nations. The same logic holds true for firms. *Competitiveness* requires adopting new technology at pace—being a quick follower. *Leadership* in the marketplace requires developing and owning new ideas and commercializing them successfully.

For Canada and for our firms, this means more investment: in acquisition of productivity-enhancing capital and technology, and in innovation, R&D, and IP. Canada has successes, notably among small and medium enterprises (SMEs) that have secured IP rights and commercialized their innovation. We need more such firms, and we need them to grow as Canadian enterprises, faster.

Technology a Driver and Enabler of Structural Change

Technology will largely determine the course of two ongoing transformations of our economy over the second quarter of this century: digitalization and decarbonization.

Digitalization, sharply accelerated during COVID, is being propelled further by the emergence and rapid development of generative AI. AI and its capabilities to perform such tasks as voice or image recognition and sophisticated data analysis are already delivering value across sectors, from manufacturing (e.g., robotics and quality control), to finance (data analytics, fraud detection) and transportation (self-driving features of automotive vehicles).

Generative AI is a new technology frontier, with the potential to create significant value and to reshape markets and jobs in ways still difficult to predict.

While official statistics suggest that to date the take-up of AI has been low, it will accelerate as per the normal process of technology diffusion and adoption (“S-curve”).¹ The new wave of innovation and applications introduced by generative AI will further accelerate development. ChatGPT went live in November 2022; within two months, it had 100 million users, prompting the quick launch of competitor services. Focusing on a sample of use cases, McKinsey estimates that generative AI could grow global economic output by some US\$2.6 to US\$4.4 trillion annually; the estimate doubles once extrapolated to the wider economy.² Goldman Sachs estimates a potential gain in global GDP of US\$7 trillion annually, equivalent to close to 3.5 times Canada's GDP.³ As discussed in Chapter 4, the workplace correspondingly is likely to be transformed profoundly, with economic and potentially social consequences as the pace of change challenges the ability of firms and workers to adapt.



In parallel, the policy and business drive to decarbonize the economy supposes a transformation of the energy supply and demand infrastructure over the next 20–30 years that will also be reliant on technology. Change in this case is more gradual. Lead times are longer. Investments are predominantly in tangible infrastructure and equipment, unlike the intangible world of digitalization. Impacts on the economy are no less pervasive and consequential.

Scenarios developed by the Canadian Energy Regulator (CER) illustrate the scope of changes in our energy system that are consistent with a net-zero Canadian economy.⁴ The scenarios draw out a transformational switching of end-use energy from hydrocarbons to electricity, biofuels and hydrogen.⁵ Electricity demand more than doubles, and meeting this demand from non-emitting sources requires the sustained, rapid expansion over the next decades of wind energy, predominantly, including onshore and offshore, as well as nuclear, solar, geothermal and biomass energy. Under the CER scenarios, CCUS and direct capture (DC) technologies make critical contributions. The drive to a net-zero economy also requires massive investment in end-use sectors—homes, buildings, industry and transportation—to convert to new fuels and to use energy more efficiently. The development of the EV industry is a compelling example. Technology will also shape the supply chains upstream of the clean economy, for example for the efficient and safe extraction and processing of critical minerals.

The pace of the energy transition globally is uncertain. What is certain is that technology will play a critical role in enabling reductions of emissions while preserving energy security, competitiveness and prosperity. In its latest scenarios, the IEA estimates that technologies not yet on the market represent around 35% of the CO₂ emissions reductions needed on a path to net zero by 2050.⁶ Meeting any climate target in Canada and internationally—even coming anywhere close—requires both the massive deployment of technology available today and rapid innovation to solve harder-to-abate emissions and to bring costs down.

Technology Is a Determining Factor in Global Value Chains

Who develops and commercializes leading-edge technology is a critical factor for countries and firms as they pursue digitalization, decarbonization and growth. Countries and firms seek to position themselves in supply chains generally understood to represent flows of materials, from the raw resource to the finished product. Supply chains are complex, and their efficiency and resilience are a priority goal. In an economy driven by technology, and increasingly founded on intangible as well as tangible assets, what matters at least equally is the wider concept of value chains—how, through the supply chains for goods or services, value is realized, notably on the strength of ownership and control of technology. These value chains are even more complex.

Technology Prominent in the Economic and National Security Strategies of Major Powers

Leadership in critical technologies like AI and clean technology is a priority in the economic and national security strategies of major global powers, motivating both offensive and defensive actions.

The United States is deploying an arsenal of tools of industrial policy to support private investment at home, and it is working with partners to manage security risks posed by China. National Security Advisor Jake Sullivan described the context succinctly: “In a world being transformed by the clean energy transition, by dynamic emerging economies, by a quest for supply chain resilience—by digitization, by AI, and by a revolution in biotechnology—the game is not the same.”⁷ The *CHIPS and Science Act (2022)*, with a public investment of US\$53 billion, aims to boost the research, development and production of semiconductors in the United States, lessen dependence on Asian producers, and counter China.⁸ Under what is described as a small garden with a high fence, the United States is applying a mix of export controls, inbound investment screening, and outbound investment restrictions to limit Chinese

access to sensitive technologies, including advanced chips to power AI. Simultaneously, the *Inflation Reduction Act* aims to ensure that “the United States—powered by American workers—remains the global leader in clean energy technology, manufacturing, and innovation.”⁹ It introduced or modified tax incentives and programs for clean energy technology, officially estimated to cost \$370 billion over 10 years, but, depending on take up, representing a potential public investment of near US\$1 trillion.¹⁰ To guard against the risk that clean energy supply chains may be weaponized, the United States is working with global partners, including the EU and Canada, to diversify sources of supply.

The EU, under a first-ever economic security strategy, is marshalling similar efforts. The EU passed its own *Chips Act* and *Net-Zero Industry Act*. It launched a STEP program that, with leveraging and crowding in of private capital, aims to mobilize 160 billion euros in the pursuit of three technology priorities, namely deep and digital technologies (including AI), clean technologies and biotechnologies.¹¹ The European Commission (EC) is developing with Member States a list of technologies that are critical to economic security and mitigating risk through measures that may include trade and inbound and outbound investment restrictions.¹² As “a clean tech race is in full swing,” the EC has also introduced a Green Deal Industrial Plan that aims at “getting

better at nurturing our own industry—from hydrogen to chemicals, from biotech to nanotech.”¹³

China has high ambitions, and it is flexing its muscles as a technological power under its own institutions, markets, relationships and values. The 14th Five-Year Plan, covering the years 2021–2025, states that “we will formulate an action agenda for becoming an S&T powerhouse, improve the new structure for leveraging national capabilities under the conditions of the socialist market economy, successfully fight tough battles for key and core technologies, and raise the overall effectiveness of the innovation chain.”¹⁴ The Plan’s IP strategy speaks to a “focus on strategic emerging industries such as new generation information technology, biotechnology, new energy, new materials, high-end equipment, new energy vehicles, green and environmentally friendly products, and aerospace and marine equipment.” The Plan also elaborates on means “to accelerate digitalization-based development and construct a digital China.” In support of its efforts, China can mobilize the full apparatus of the state, including state-owned enterprises and research institutes, and it can enlist innovative private enterprises.

The regulatory instruments for climate and clean technology are differentiated across the three major powers, reflecting distinct circumstances and value systems, but also a common ambition to secure economic advantage. Box 5.1 describes the approaches to AI.

Box 5.1

APPROACHES OF MAJOR POWERS TO REGULATE AI AND TO LEAD GLOBALLY

- In the **United States**, the president issued in October 2023 an executive order, noting that “the rapid speed at which AI capabilities are advancing compels the United States to lead in this moment for the sake of our security, economy, and society.”¹⁵ The order sets out principles and priorities to govern the actions of the administration in harnessing

the benefits of AI and managing its risks. It says the following about the undertakings: “My Administration will support programs to provide Americans the skills they need for the age of AI and attract the world’s AI talent to our shores—not just to study, but to stay—so that the companies and technologies of the future are made in America.” The order follows the



efforts of the U.S. administration to secure voluntary commitments for “safe, secure, and transparent development” from the companies that dominate the field in the United States and globally (Amazon, Anthropic, Google, Inflection, Meta, Microsoft and OpenAI).¹⁶

- In the **EU**, the Parliament adopted in June 2023 a draft AI law that sets out a framework to manage risk, restrict harmful uses of the technology, and impose transparency requirements for developers of generative AI.¹⁷ The draft law is being discussed with member countries, and a final text is expected by the end of 2023. This is consistent with the determination of the EU, through such instruments as the *Digital Services Act* or the *General Data Protection Regulation (GDPR)*, to establish *de facto* global standards for the digital economy.
- **China** enacted in August 2023 a set of regulations for generative AI services that require providers to carry out a security review and to register their services with the government. The final regulations are less stringent than a first draft issued in April, reportedly reflecting consultations, including with China technology leaders such as Baidu,

Alibaba and SenseTime.¹⁸ Perceived by some initially as conveying an overriding goal of Chinese authorities to control the technology and its security and political risks, for example by requiring that developers uphold “core Socialist values,” the intent is described by an expert more comprehensively as establishing “an AI governance framework (that) will reshape how the technology is built and deployed within China and internationally, impacting both Chinese technology exports and global AI research networks.”¹⁹

- The major powers are also participating in various fora to establish principles and standards for the development and application of AI. At the AI Safety Summit convened by Prime Minister Rishi Sunak of the United Kingdom on November 1–2, 2023, 29 signatories, including the United States, the EU, Canada, other members of the G7 and China, signed a declaration, agreeing that “many risks arising from AI are inherently international in nature, and so are best addressed through international cooperation. We resolve (...) to promote cooperation to address the broad range of risks posed by AI.”²⁰

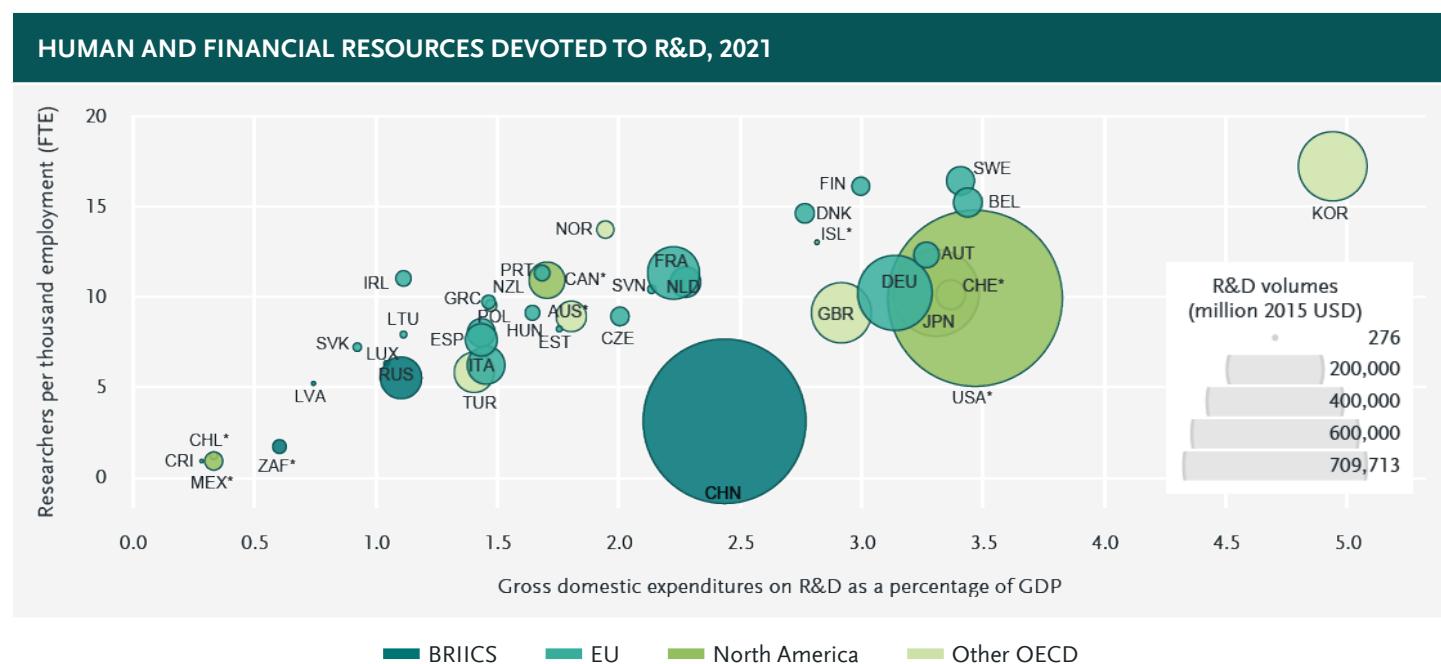
Major Powers in Strong Technology Leadership Positions

The global race for technological leadership, including in the domains of AI and clean technology, is dominated by the major powers and by economies, such as Japan and Korea, that historically have placed innovation at the centre of their development strategy.

The volume and intensity of R&D give a picture of the innovation capacity of the major economies. As a proportion of GDP, there is a cluster of countries, including the United States, Japan, Germany and the

Scandinavian countries, that invest 2.5% to 3.5% of their GDP in R&D (public and private sectors), with also a high proportion of researchers in the workforce (Chart 5.1). China invests proportionately less, 2.2% of GDP in 2019, but its volume of R&D is second only to the United States, and it has risen fast. Korea is an outlier in the OECD, with R&D representing 4.6% of its GDP. Note that Canada and Australia, two resource-based economies, are in a cluster of economies with a competitive proportion of researchers but low spending on R&D (1.5% to 2% of GDP).

Chart 5.1



Source: OECD, Main Science and Technology Indicators Database, <http://oe.cd/msti>, September 2023. * Latest available data prior to 2021

The technology prowess of the major powers and leading innovative economies is also illustrated by the propensity of their corporations and research institutes to pursue IP rights. R&D expenditures are an input. The target output is technologies or processes that will realize value. One indicator of commercial value is the IP rights that flow from the R&D. Patent applications are an imperfect indicator (not all patents are created equal and not all are valuable), but they illustrate how intensely different economies are pursuing advantage. China overwhelms other economies, even the United States, in the filing of patent applications, although the large majority of its patenting is done in China itself, potentially limiting commercial value globally (Table 5.1). The United States, Japan and Korea follow in order for the number of applications. Large, multinational firms from these economies, predictably, dominate global patent filings. For example, among the top ten corporations filing under the Patent Cooperation Treaty in 2021 (seeking protection in multiple jurisdictions simultaneously), three are Chinese (Huawei, Oppo and BOE Technology), three Japanese (Mitsubishi, Nippon

Telegraph and Panasonic), two Korean (Samsung and LG), one American (Qualcomm), and one Swedish (Ericsson).²¹ Adjusting patent data (in this case patent families) for the size of the economies modifies some of the ranking—Korea then dominates largely and Finland and Sweden outperform their peers—but the leading pack is roughly the same (Table 5.2).²²

In the Global Technological Race, Canada Is Not Starting from a Position of Strength

Canada under-invests in R&D. Prior issues of our *Economic Outlook* described Canada's investment gaps relative to the United States and the average of the OECD countries, notably for machinery and equipment, and IP products. Chart 5.1 illustrates the gap for R&D. The total annual expenditure of 1.6% of GDP for Canada, compared with an OECD average of 2.7%, represents a gap of some \$30 billion, year-after-year. Moreover, the gap with the OECD average and major economic partners has been growing over the past 20 years (Chart 5.2). The trend is a matter of both Canada spending less on R&D as a share of



Table 5.1:

WORLD PATENT APPLICATIONS BY ORIGIN, 2021			
Origin	Resident	Abroad	Total
China	1,426,644	111,960	1,538,604
United States	262,244	247,718	509,962
Japan	222,452	190,433	412,885
Republic of Korea	186,245	81,282	267,527
Germany	65,757	100,069	165,826
France	24,036	42,101	66,137
UK	17,215	36,435	53,650
Switzerland	9,732	38,604	48,336
India	26,267	16,896	43,163
Italy	15,205	19,001	34,206
Netherlands	8,648	24,131	32,779
Sweden	6,721	21,081	27,802
Canada	4,710	21,794	26,504

Source: World Intellectual Property Office (WIPO) Statistics Database. Patent filing by origin includes resident applications (in home jurisdiction) and applications filed abroad. The origin of a patent application is determined by the residence of the first named applicant.

Table 5.2:

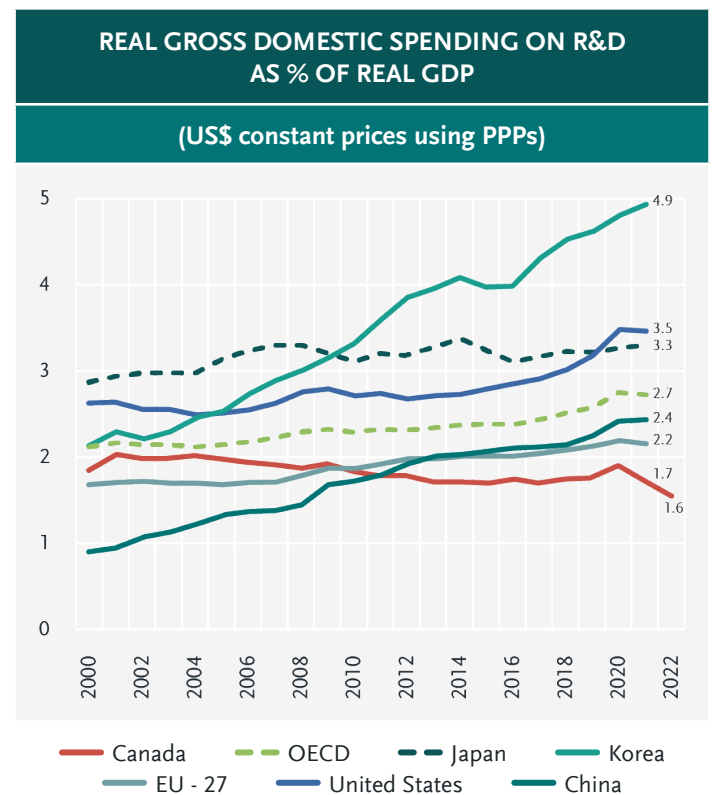
PATENT FAMILIES PER US\$100 BILLION OF GDP, BY ORIGIN, 2021			
1. Korea	55.3	9. Denmark	20.8
2. Japan	42.6	10. Netherlands	20.7
3. Switzerland	33.0	11. United States	18.2
4. Finland	26.7	12. Austria	17.0
5. Sweden	25.4	13. Luxembourg	16.8
6. Singapore	24.9	14. Belgium	13.5
7. Israel	23.6	15. France	11.9
8. Germany	22.2	16. Canada	11.4

Source: WIPO Statistics Database. Foreign-oriented patent family by origin (nominal count). Compiled by the Canadian Intellectual Property Office.

its economy and other countries spending more, in some cases spectacularly so (Korea and China). In a global race that is accelerating, Canada is taking its foot off the pedal. Developments that have hurt our performance over the last 15–20 years include the demise of Nortel, the downfall of Blackberry, the retreat of big pharma, and more recently the restructuring of Bombardier. Success stories have not been at that scale.

Canada also claims a small share of innovation in the form of IP rights. This is largely a corollary of the R&D gap, and it has particular significance because it means that our firms are in a lesser position to commercialize and realize dividends of innovation in global value chains. As shown in Table 5.2, on a comparison of patent families per US\$100 billion of annual GDP, Canada ranks low and far behind some small advanced economies, such as Switzerland, Finland or Singapore.

Chart 5.2:



Source: OECD

Even in domains now at the heart of structural change, where Canada may claim or aspire to have an advantage—including AI and energy—it is struggling to punch at its weight, let alone above it, in the global contest for technological leadership (Box 5.2).

Canada’s modest results in establishing a technology leadership position and securing IP rights in turn becomes an impediment to R&D and to the scale-up of innovative firms by constraining their “freedom to operate.” Firms that aim to innovate, secure private capital, grow and conquer global markets need the IP rights to do so. Global competitors that have captured such rights are in a position to thwart the Canadian firm, discourage investment, diminish the value or the enterprise, or acquire it or its assets on favourable terms.

Canadian innovators may be further encumbered by policies and industry standards shaped by the major economic powers to advantage their firms in their domestic and global markets. IP rights, data governance and management, the protection of privacy, competition policy, industrial policy, technical standards, or even voluntary codes all are played out in domestic markets but also in international trade and investment agreements and protocols. Canada has a lesser voice in negotiating the rules of the game than the major powers and technology leaders, because of both the smaller size of our economy and the fewer resources we apply to innovation.

A Long-Standing Challenge for Canada with No Easy Fix

The innovation gap has been reviewed in a succession of reports and policy documents over time (see Box 5.3); there is a complex set of factors at play and policy responses to date, while supportive of business-led innovation, have not yet succeeded in moving the needle appreciably. The reports by expert panels and business leaders all recognize a gap that historically is rooted, among other factors, in our industrial structure, shaped by a strong resource sector and branch-plant manufacturing, and a prudent business

culture—factors difficult to overcome. The reports convey a similar ambition to position Canada among global technology leaders in domains of comparative advantage, in particular by enabling our innovative firms to scale up and win internationally. They agree that there is no single solution, and that a suite of policies has to be enacted in collaboration with the private sector, as well as universities, to create the right conditions and incentives. Governments have responded by amending and creating a diversity of programs, but none appear to have succeeded in creating a self-reinforcing dynamic of change.

In Budget 2022, the Government announced a new Canada Innovation Corporation (CIC) to support Canadian businesses in developing and protecting IP and in capturing segments of global supply chains, starting from the same diagnostic.

“Canadian businesses do not invest in research and development (R&D) at the same level as their global peers. This has resulted in their reduced capacity for turning new ideas and inventions into globally competitive products and processes, and challenges in creating and protecting intangible assets, such as intellectual property. (...) This is Canada’s longstanding economic Achilles’ heel.”²³

Federal Budget 2022

The new corporation, once operational, may address some gaps, but there needs to be an integrated strategy and collaboration with the private sector to change the game. The CIC has been legislated in 2023 as a new Crown corporation. It will absorb and deliver the Industrial Research Assistance Program (IRAP) of the National Research Council (NRC), develop and administer other funding programs, and provide advisory services to firms. It will act as a centre of expertise on national and international industrial and technology trends and promote the ownership of intangible assets in Canada. It will



have a budget of \$2.6 billion over four years. Even with the best implementation, the new entity will be only one cog in a complex machine of federal (and provincial) programs.

Similarly, efforts targeting the incentives and capacity of Canadian businesses to acquire and manage IP for (offensive and defensive) market advantage can play a role, but only if framed within a wider strategy.

In 2018, the Government of Canada launched “a comprehensive IP Strategy to help Canadian businesses, creators, entrepreneurs and innovators understand, protect and access IP.”²⁴ The goals and mechanisms, some at the pilot stage (e.g., a Patent Collective), are valid. The strategy may help raise awareness among SMEs, in particular. Federal and provincial programs are also available to assist SMEs with some of the costs of patent filings. IP policy and programs have to recognize the long lead times for commercialization of IP and encourage firms to secure not only more patents, but critically high-quality patents that withstand litigation and generate value.

Placing Innovation and Technology at the Centre of Business Strategy and Policy

As digitalization and the energy transition transform the economy, there is an opportunity for Canada to leverage its strengths, innovate and gain a stronger foothold in global value chains. Our universities, research centres and businesses have the human resources to be more innovative. Our natural resource base, from hydrocarbons to critical minerals or uranium, covers the full spectrum of commodities that, with the right technology, can power the economy and supply global markets through and beyond the transition. Industries like energy, agri-food, automotive products, advanced manufacturing and services, for example financial services, are ripe for innovation. Where the risk-return proposition is sound, financial capital can be mobilized.

Canadian businesses and researchers will not dominate the global technology race across entire domains, but by focusing on comparative strengths and commercial opportunity, they can gain early-mover advantage and capture some segments of world markets. Large multinational firms from the major economies already have a stronghold in foundational technologies for digitalization and the clean economy. For our firms, the first order of business is to buy and adopt the best available technology. There is considerable value—and typically modest risk—in being an early follower. In fact, to be globally competitive, Canadian businesses have to invest more in machinery and equipment, information and communication technology, and software, the majority of which will be acquired from foreign sources or Canadian subsidiaries. However, the greatest rewards for start-ups or established firms flow from innovation and R&D that is translated into commercial opportunities and the creation of IP and intangible assets. Technological edge even in niche applications can propel the development of firms in global markets.

Indeed, to claim credibly to be a leader in AI, or in critical minerals, hydrogen, CCUS, SMRs, batteries or the EV supply chain, Canada requires an ability to create its own technological and market leadership through innovation. For AI, accepting the dominant position acquired by big tech through massive R&D and M&As, there is a wide field for innovation in the continued development of the technology and critically in its safe and responsible applications across the economy. Similarly, through the energy transition, billions of dollars of public and private investment can serve in part to push out the frontier of technology and to earn dividends for Canada in global markets. In this case, the rewards may be not only financial, through the sale or licensing of technology, but environmental through contributing to lower emissions globally. Our success in creating such advantages in a global race for technology will be critical for Canada’s prosperity.

Our innovative start-up, emerging and established firms can help chart a path. While our standing as an economy in aggregate is below par, some of our home-grown firms match or beat global competition and serve as examples that can inspire business strategy and public policy. There is a vibrant ecosystem of start-ups and unicorns in AI-related fields. Some of our firms in the resource and clean tech industries are also at the frontier of technology. These firms know the potential rewards. They also know the struggles, particularly when aiming to commercialize their innovation. It is widely accepted that governments are poor at picking winners, but there is a need to work with the private sector and researchers to articulate a strategy, implement enabling policies, and make the right investments, covering the range from basic science to commercial application. There is advantage in allowing winners to inform and to inspire public policy.

Innovation and technology leadership must be at the heart of policy and business strategy. Industrial policy is making a comeback internationally, notably in the United States, and Canada has introduced and expanded a universe of programs, grants and tax credits, in particular to accelerate the energy transition. Quite reasonably, this includes the attraction of foreign investment. The announcements of new foreign investments often cite the number of jobs created, the emissions reductions, or the contribution to secure supply chains. These are important goals. Critically, policy has to be responsive to the needs of *Canadian* innovative enterprises, helping to de-risk investment in R&D and technology and to support the commercialization of ideas in domestic and export markets.

Canada has no shortage of funding programs; indeed, there may be too many. Firms need to spend

more of their time building their technological and market advantage, and less time navigating a sea of programs. With refinements, the Scientific Research and Experimental Development (SR&ED) tax credit and IRAP, both well-known and of general application, can provide the foundation for a streamlined program architecture. If there is a case for a CIC, it is largely to improve the integration and delivery of programs and to connect policy initiatives within a coherent strategy.

Beyond funding programs, framework legislation and market regulation have to be modernized to support innovation while managing risks. Our enterprises will be thwarted in their innovation efforts if our market rules are not up to global standards and do not create the space for competition and innovation. Chapter 1 cites some structural policy priorities for Canada.

Governments and businesses have to work with global partners to realize the full benefits of technology, but this should not obscure the need to create distinct Canadian advantages. Our businesses will work with global partners, and Canada will aim to attract foreign investment. Universities and research institutes will collaborate internationally. Governments will also work with their international peers to ensure that trade agreements, rules, standards and codes facilitate the conduct of international business. However, like the United States, the EU, Japan, Korea or other economic partners, we have to do so by ensuring that collaborations advance win-win outcomes and strengthen the capacity of our innovative firms to compete effectively with their global peers.

In sum, businesses and governments have to place innovation and technology at the core of their strategy and collaboration. The opportunity and the need are even more compelling in a period of structural transformation.



Box 5.2

PATENT FILINGS IN DOMAINS OF COMPARATIVE STRENGTH FOR CANADA

AI

Canada boasts pioneering work in AI. It has three university-based centres of excellence with world-leading researchers, as well as an ecosystem of businesses, from start-ups funded by venture capital investors to subsidiaries of multinational firms. The head start by Canada enabled it to be among early leaders for research publications and to claim about 1.8% of global patents by 2017 (roughly equivalent to our economic weight), ranking 6th behind China, the United States, Japan, Korea and Germany.²⁵ The meteoric rise in patenting activity by China and the United States starting in the mid-2000s and the acceleration of innovation worldwide have diminished Canada's early-mover advantage. In 2019, the top 30 patent applicants worldwide were large corporations from Japan, the United States, Korea and Germany, plus three research institutes from China and one from Korea.²⁶

The recent emergence of generative AI, with again important early contributions from researchers in Canada, creates excitement. Some 30 generative-AI Canadian companies have attracted investment of close to US\$700 million.²⁷ Canadian-based AI innovators filed patent applications at an accelerated pace in the past two years, with a rate of increase greater than in the United States. There is an appreciable economic opportunity. However, the base (e.g., our patent portfolio) is small, and global competition is fierce. In fact, a majority of patent applications filed from Canada originate from subsidiaries of foreign multinationals, including big tech.

This speaks positively to the Canadian talent base and to our capacity to attract investment around our major centers of AI learning and research, but

not equally to the ability of Canadian businesses to emerge, to grow, to develop a market advantage, and to realize the full benefits of innovation.

Energy and Clean Tech

Similarly, as regards energy, it is reasonable to expect one of the world's largest and most diversified energy suppliers, with again an impressive pool of talent and deep sources of capital, to be at the leading edge of energy technology. However, the evidence does not demonstrate this. In 2021–2022, the leading patentees in Canada (patents granted by CIPO) included Halliburton Energy Services (133) and Schlumberger Canada (49), far ahead of Suncor (21).²⁸ Foreign entities are carving more of an IP space in the Canadian energy industry than our own firms. This could be even more pronounced in the energy transition. Over the period of 2010 to 2019, Europe dominated the filing of patent applications (in more than one jurisdiction worldwide) for clean energy technology (28%).²⁹ It was followed by Japan (25%) and the United States (20%). China and Korea had smaller shares during this period—8% and 10%, respectively—but again both economies are ramping up their innovation activity rather quickly.

Europeans have a strong position in renewable energy technologies. The United States has relative strengths, among other fields, in clean technology for heavy industry, refining and long-distance transportation, as well as in nuclear technology and CCUS. Japan and Korea both are pursuing leadership in a range of fields, notably in batteries and the EV industry. It is not apparent where Canada may be seeking or securing a technological competitive edge.

For example, in hydrogen, where Canada has the ambition to become a world-leading producer and exporter, there is not yet a demonstrated technological advantage (Table 5.3). Again, the patenting is led by the EU and Japan, with the United States third, followed by Korea and China. Canada has a share of patent applications over the period of about 2%, not out of line with our economic weight, but also not conveying a distinct advantage for our industry.

Chart 5.3:

SHARE OF PATENT APPLICATIONS FOR HYDROGEN TECHNOLOGIES, BY ORIGIN, 2011–20	
	%
European Union	28
Japan	24
United States	20
Korea	7
China	4
Canada	2

Source: International Energy Agency, *Hydrogen Patents for a Clean Energy Future. A global trend analysis of innovation along hydrogen value chains*, January 2023, Percentages based on International Patent Family (IPF) filings representing filings in more than one jurisdiction.

Box 5.3

A HISTORY OF ANALYSIS AND POLICY TO LIFT BUSINESS INNOVATION

Canada's sub-par innovation and R&D performance has been a preoccupation of analysts and policy-makers for decades. A Senate Commission in the early 1970s observed the following:

“Since 1916 ... the main objective of Canadian science policy has been to promote technological innovation in industry ... Almost every decade since the 1920s has witnessed renewed attempts by successive Canadian governments to achieve it, but on the whole they have all failed.”³⁰

In 2009, an expert panel convened by the Council of Canadian Academies (CCA), in a report called *Innovation and Business Strategy: Why Canada*

Falls Short, noted Canada's productivity problem, in particular low growth in multifactor productivity, which it attributed largely to weak business innovation, including low levels of R&D.³¹ On comparing business R&D spending between Canada and the United States, the panel observed that more of Canada's gap was explained by differences *within* sectors, than by Canada–U.S. differences in sector mix. The panel explained that the decision of firms to make innovation the core of their business strategy depends on a complex set of factors, including market opportunities, industry characteristics, competitive intensity, the climate for new ventures (e.g., risk capital, relationships with universities), public policy and business ambition. Correspondingly, raising innovation and R&D intensity requires sector-by-sector consultations and strategies to align policies with the forces shaping business decisions.



In 2011, another expert panel was asked by the Government of Canada to conduct a comprehensive review of federal support for R&D. The report, *Innovation Canada: A Call to Action*, started with the same diagnostic as the CCA.³² Setting out a vision of a more productive and internationally competitive economy, it stated that “the government must focus its efforts on the goal of growing innovative firms into larger enterprises, rooted in Canada but facing outward to the world and equipped to compete with the best.” The panel’s recommendations, covering the structure and delivery of funding aids, including programs and the SR&ED tax credit, the provision of venture capital, government procurement, and an enhanced business orientation for the NRC, inspired efforts in subsequent federal budgets to improve federal support and private financing for business-led innovation and R&D.³³ Noting that “the necessity created by competition is often the “mother” of innovation,” the panel commented that its proposed actions would have more impact if complemented by policies to foster stronger competition. There was less follow through on this point.

Budget 2016 launched an **Innovation Agenda** with a high ambition, namely, “to build Canada as a center of global innovation. Canada will be propelled by its creative and entrepreneurial citizens; its leading science and technology; its excellent innovation infrastructure; and its globally competitive companies offering high-quality products and services, thriving within a business environment that supports commercialization and growth.”³⁴ The vision underpinned a series of initiatives rolled out in successive budgets aimed to support world-class research, clusters of innovation, foreign investment, and the growth of innovative Canadian firms.

In 2017, in the second of its reports called *Unlocking Innovation to Drive Scale and Growth*, the Advisory Council on Economic Growth noted the complexity of the innovation ecosystem and identified three bottlenecks: “a gap between invention and revenue-generating commercialization, a struggle to scale up successful start-ups and SMEs, and no burning platform for corporate adoption of innovation.”³⁵ The Council observed, in particular, that “the country does not benefit as much as it should from the IP that it generates.” The recommendations were for the most part high-level, with the one most immediately pursued by the government being to simplify the attraction and retention of top global talent.

In 2020, during COVID, the government sought the advice of the private-sector-led Industry Strategy Council, which submitted a report entitled *An Ambitious Growth Plan for Building a Digital, Sustainable and Innovative Economy*.³⁶ Again, among the challenges cited by the Council was that: “Canada’s business sector has long faced an innovation challenge, particularly in exploiting R&D and our ability to capture value from our intellectual property.” The Council advocated for an industrial strategy building on Canada’s strengths in the digital economy, resources and clean tech, high-value manufacturing and agri-food. Follow through on the report was not immediate. With the United States and other global competitors moving aggressively, the government has introduced new instruments of industrial policy (e.g., tax credits and subsidies), but it has been slower to address the structural policies—for example, a focus on competitive regulation—advocated by the Council.

In June 2023, the Senate Standing Committee on Banking, Commerce and Trade released a report entitled ***Needed: An Innovation Strategy for the Data-Driven Economy***.³⁷ The report states that: “Current government policies, programs and technical knowhow are not adapted to the realities of the innovation-based and data-driven economy – or the intangible economy. (...) Most peer nations, including the United States, have already

shifted their attention. Without coordinated policy changes that adapt to the realities of the intangible economy, Canada will continue to see an erosion in both domestic and foreign investment, and in standards of living.” Policy proposals in the report cover the IP regime, a national data strategy and digital standards, the streams of capital, government procurement and federal framework legislation for data usage, privacy and competition.



Notes

Chapter 1

1. Copernicus Climate Change (European Union), [Monthly Climate Bulletin, 2023 on track to become the warmest year after record October](#), November 10, 2023.
2. Copernicus Atmosphere Monitoring Service (European Union), [2023 Canada wildfires emissions have already doubled previous annual record](#), press release, August 3, 2023. For a more complete analysis, see *The Guardian*, [After a record year of wildfires, will Canada ever be the same again?](#) November 9, 2023.
3. International Energy Agency, [Clean energy investment is extending its lead over fossil fuels, boosted by energy security strengths](#), press release, May 25, 2023.
4. Bank of Canada, Remarks by Carolyn Rogers, Senior Deputy Governor, [Financial stability in a world of higher interest rates](#), Vancouver, November 9, 2023.
5. International Monetary Fund, [World Economic Outlook, Navigating Global Divergencies](#), October 2023.
6. Of total merchandise exports of \$636.3 billion for Canada in 2021, energy products represented \$134.8 billion, or 21.2%; minerals and mineral products, \$102.3 billion, or 16.1%; and motor vehicles and parts \$72 billion, or 11.3%. See Government of Canada, [State of Trade 2023: Inclusive Trade](#).
7. Canada Mortgage and Housing Corporation, [Estimating how much housing we'll need by 2030](#), September 13, 2023.
8. *Supra*, footnote 6.
9. Competition Bureau, [Competition in Canada from 2000 to 2020: An Economy at a Crossroads](#), October 2023
10. Senate of Canada, Standing Committee on Banking, Commerce and the Economy, [Needed: An innovation strategy for the data-driven economy](#), June 2023
11. Government of Canada, [Statement by Ministers Guilbeault and Virani on the Supreme Court of Canada's opinion on the constitutionality of the Impact Assessment Act](#), October 13, 2023

Chapter 2

1. On an annual basis, growth rates for the G-20 were almost identical to world growth rates over 2011–2022. For instance, in the period 2020–2022, the former were -3.0%, 6.5% and 3.2% and the latter -2.8%, 6.3% and 3.5%.
2. See World Bank, [Commodity Markets Outlook](#), October 2023.
3. It is highly appropriate for the BoC to monitor CPI-trim and CPI-median as measures of core inflation because CPI-XFE inflation this year has been made significantly more persistent by sizeable increases in mortgage interest cost (MIC), which has a weight of about 4% in total CPI and which reacts positively rather than negatively to past interest rate changes. In the United States the CPI shelter component is measured differently than in Canada so that United States core inflation does not incorporate any MIC. This is an important reason why, in contrast with Canada, annualized 3-month CPI-XFE inflation in the United States was much lower in the August-October period than in June. In any event, a measure of MIC for the United States would have shown less movement in response to interest rate changes than in Canada because mortgages are rolled over less frequently in the United States.
4. International Monetary Fund, [World Economic Outlook, Navigating Global Divergencies](#), October 2023.
5. OECD, [OECD Economic Outlook, Restoring Growth](#), November 2023.
6. Jerome H. Powell, [Opening Remarks](#) at “Monetary Policy Challenges in a Global Economy,” a policy panel at the 24th Jacques Polak Annual Research Conference, hosted by the International Monetary Fund, Washington, D.C., November 9, 2023.
7. Bank of Canada, [Monetary Policy Report](#), October 2023.

Chapter 3

1. IMF, [World Economic Outlook: Navigating Global Divergences](#), October 2023; WTO, [Global Trade Outlook and Statistics](#), October 2023.
2. Asian Investor, [Canada's pension funds ditch Chinese private equity](#), August 31, 2023.
3. For 2022: total U.S.-China imports and exports grew by 2.5% year-on-year to reach close to US\$700 billion, the highest on record, although the total share of Chinese imports to the U.S. dropped by approximately 3% since the 2018 imposition of tariffs by former President Trump. China's trade in goods with the EU grew by 5.6% in 2022. For Canada, imports from China grew by over 16%, while exports to China grew by a more modest 2%, constrained by China's COVID lockdowns and by the fact that restrictions on canola imports were lifted only in May 2022. Year-on-year for Q2 of 2023, the value of Canadian exports to China grew by over 23%, while the value of imports from China dropped by over 8%. See University of Alberta China Institute, [Canada-China Trade: Q2 2023](#), October 13, 2023.
4. The Eastern Mediterranean gas pipeline between Israel and Egypt was shut down for a month following the outbreak of hostilities. See: Reuters, [Chevron says natgas flow resumes through Israel-Egypt pipeline](#), November 14, 2023.
5. BBC News, [The cost of the Suez Canal blockage](#), March 29, 2021.
6. Bank for International Settlements, [Mapping the realignment of global value chains](#), October 3, 2023.
7. Office of the Superintendent of Financial Institutions, [OSFI issues draft Climate Risk Returns for consultation](#), June 28, 2023.
8. IFRS, [ISSB Update, September 2023](#). The new standards fully incorporate the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) and consolidate the requirements of multiple other leading sustainability reporting frameworks.
9. [Canadian Securities Administrators statement on proposed climate-related disclosure requirements](#), July 5, 2023.
10. World Economic Forum, [Emissions Measurement in Supply Chains: Business Realities and Challenges](#), November 2023.
11. Office of the [Canadian Ombudsperson for Responsible Enterprise](#), June 13, 2023.
12. [Canada Gazette, Part I, Volume 157, Number 20: PARLIAMENT](#), May 20, 2023. The text of the Act is found on the [Justice Laws Website](#).
13. "Government institution" is defined in Section 2 as according to the definition of "government institution" in Section 3 of the Access to Information Act, namely:
 - a. any department or ministry of state of the Government of Canada, or any body or office, listed in Schedule I; and
 - b. any parent Crown corporation, and any wholly owned subsidiary of such a corporation, within the meaning of Section 83 of the Financial Administration Act.

The Act creates reporting obligations for government institutions producing, purchasing or distributing goods in Canada.
14. s. 6, 11 of the Act.
15. s. 8, 13 of the Act.
16. International Energy Agency, [Net Zero Roadmap: A Global Pathway to Keep the 1.5 °C Goal in Reach](#), September 2023.
17. International Renewable Energy Agency, [World Energy Transitions Outlook 2023](#), June 2023.
18. Cleantech Group, [Global Cleantech 100](#), January 2023.
19. Export Development Canada, [Exploring Canada's Cleantech Sector](#), October 2022.
20. Jeffrey Jones, [Opinion: Canada's cleantech economy suffering from too many recommendations, not enough action](#), *Globe & Mail*, February 2, 2023.
21. [Cyber Security Innovation Network](#), August 24, 2021.
22. Government of Canada and CIFAR, [Canada's leadership in AI—talent, ecosystems, and responsible AI](#), May 4, 2021.
23. Information and Communications Technology Council, [Unlocking Canada's Potential for a More Competitive Future](#), October 19, 2023.
24. [Overview of Canada's agriculture and agri-food sector](#), July 6, 2023.
25. Remarks by Christopher McLennan, Canada's G20 Sherpa, to a Global Food Security Forum, India, November 2022, [Food security: A perspective from Canada](#), November 12, 2022;



See also Canadian Agri-Food Policy Institute, [Canadian Agri-Food in a Hungry World](#), February 2023.

26. Innovation, Science and Economic Development (ISED) Canada, [Canada's Protein Industries Cluster](#), February 13, 2023.
27. [Protein Industries Canada](#).
28. Protein Industries Canada, [A sustainable micronutrient fertilizer](#)

[made from pea, lentil and other plant-based hulls reaches commercialization](#), May 26, 2022

29. On November 7, 2023, the President of the Treasury Board announced the launch of a public consultation on “regulatory opportunities to improve the efficiency and resiliency of Canada’s supply chains”; see Government of Canada, [Minister Anand invites stakeholders to provide input on federal regulations to strengthen Canada's supply chains](#), November 7, 2023

Chapter 4

1. The analysis in this section relies on the fixed-employment-weight version of the Labour Force Survey (LFS) measure of average hourly earnings for the total economy. This version shows changes in average hourly earnings as if the structure of employment by occupation through the period were unchanged, i.e., the same as in 2019. A fixed-weight version should provide a truer rendering of pure aggregate wage pressure than the unweighted measure also coming out of the LFS. Changes in the unweighted version of average hourly earnings can incorporate changes from shifts in the composition of the labour force, for example from lower wage to higher wage occupations. In the last year, both LFS-based measures have exhibited higher year-on-year growth than other measures of aggregate wage rates (e.g., the Survey of Employment Payroll and Hours). Consequently, the LFS has conveyed larger real wage gains, recently.
2. We measure excess demand for labour by the difference between the ratio of job vacancies to unemployment and the value of this ratio in 2019 when the labour market was roughly in balance.
3. See John B. Taylor, [The Staying Power of Staggered Wage and Price Setting Models in Macroeconomics](#), National Bureau of Economic Research, Working Paper 22356, June 2016.
4. Settlements are expressed on an employee-weighted basis.
5. For a more detailed discussion on the impact of demographics on economic growth, see Charles Goodhart and Manoj Pradhan, [The Great Demographic Reversal: Ageing Societies, Waning Inequality, and an Inflation Revival](#), August 9, 2020.
6. For a historic breakdown of the various classes of IMP workers, see Statistics Canada, Economic and Social Reports, [Foreign workers in Canada: Work permit holders versus employment income records, 2010 to 2022](#), October 2023.
7. Numbers cited in ImmigCanada (consulting firm). [In 2022, Over 120,000 Temporary Residents Became Permanent Residents](#), March 1, 2023.
8. For a review of the types of work by province performed by IMP workers, see CIC News, [Canada's top jobs for LMIA-exempt work permit holders in 2021](#), February 2022.
9. CIC News, [Canada breaks record by welcoming over 550,000 new international students in 2022](#), February 15, 2023.
10. Statistics Canada, Youjin Choi, Eden Crossman and Feng Hou, [International students as a source of labour supply: Transition to permanent residency](#), June 2021.
11. The Honourable Sabi Marwah (former senator), Senator Ratna Omidvar, Senator Yuen Pau Woo, and Senator Hassan Yussuff, [Strengthening the Integrity of Canada's International Student Program](#), September 18, 2023.
12. See Immigration, Refugees and Citizenship Canada, [Changes to International Student Program aim to protect students](#), October 27, 2023.
13. Statistics Canada, [Canada's population estimates: Record-high population growth in 2022](#), March 22, 2023.
14. Immigration, Refugee and Citizenship Canada, [Stabilizing Canada's immigration targets to support sustainable growth](#), November 1, 2023.
15. The remaining new economic immigrants came through the Canadian Experience Program. This amounted to 42% of all male and 39% of female economic class immigrants in 2022..
16. Immigration, Refugees and Citizenship Canada, [Canada launches new process to welcome skilled newcomers with work experience in priority jobs as permanent residents](#), May 31, 2023.

-
17. By way of example, in September 2023, invitations to apply for permanent residency were issued to 1,000 truck drivers with a minimum skill /education rating of 435 points. This contrasts with higher skilled workers who usually have a minimum skill/ education rating of over 500 points.
 18. For a discussion regarding difficulties highly skilled workers encounter upon entry, see Statistics Canada, Feng Hou, Yao Lu and Christoph Schimmel, [Recent Trends in Over-education by Immigration Status](#), December 2019; Statistics Canada, Lahouaria Yssaad and Andrew Fields, [The Canadian Immigrant Labour Market: Recent Trends from 2006 to 2017](#), December 2018.
 19. Despite some progress, provinces still permit extensive regulatory barriers to skill credentials for new immigrants. Licensing remains onerous and expensive for most professions.
 20. See Canadian Future Skills Centre, [Focus on Artificial Intelligence and Technology Disruption](#).
 21. McKinsey & Company, [The Economic Potential of Generative AI, the Next Productivity Frontier](#), June 2023.
 22. Goldman Sachs Intelligence, [Generative AI could raise global GDP by 7%](#), April 5, 2023.
 23. [OECD Employment Outlook 2023: Artificial Intelligence and the Labour Market](#), July 2023.
 24. See Paul Krugman, [A.I. May Change Everything, but Probably Not Too Quickly](#), New York Times, March 31, 2023.
 25. *Ibid.*
 26. *Supra*, footnote 19. See also Paul Krugman, [Will AI Transform the Economy and if so How](#), New York Times, October 3, 2023.
 27. *Supra*, footnote 18.
 28. See Pew Research Center, [Which U.S. Workers Are More Exposed to AI on Their Jobs?](#) July 26, 2023.
-

Chapter 5

1. Official data for AI adoption is sparse and not necessarily on the same bases. Surveys from national statistics agencies, including Statistics Canada, suggest slower rates of adoption than some private sector surveys. For example, for larger firms 2021 estimates suggest rates of adoption of 20% for Canada (firms of 100+ employees) and 31% for France or Germany (250+ employees). Rates of adoption are lower for smaller firms, e.g., only 6% in Canada for firms between 20 and 99 employees. See OECD Estimates for Canada, France, Germany. See OECD, [The impact of AI on the workplace: Main findings from the OECD AI surveys of employers and workers](#), March 2023.
2. McKinsey & Company, [The Economic Potential of Generative AI, the Next Productivity Frontier](#), June 2023. The estimates represent increments over the potential value of nongenerative AI, estimated by McKinsey to represent US\$11 to US\$17 trillion annually.
3. Goldman Sachs Intelligence, [Generative AI could raise global GDP by 7%](#), April 5, 2023.
4. Canadian Energy Regulator (CER), [Canada's Energy Future 2023: Energy Supply and Demand Projections to 2050](#).
5. In the CER scenario consistent with Canada (but not the world) achieving net zero emissions by 2050, the share of oil products and natural gas in end-use energy in the domestic market falls from 74.1% in 2023 to 37.7% in 2050. The share of electricity more than doubles from 17.7% to 39.1%, with biofuels and hydrogen capturing market shares of 11.8% and 11.3%, respectively, in 2050.
6. The IEA notes that with rapid innovation, this number is down from 50%, which was estimated in its report only two years before. See International Energy Agency (IEA), [Net Zero Roadmap: A Global Pathway to Keep the 1.5 °C Goal in Reach](#), September 23.
7. [Remarks by National Security Advisor Jake Sullivan on Renewing American Economic Leadership at the Brookings Institution](#), April 2023.
8. White House, [Fact Sheet: CHIPS and Science Act Will Lower Costs, Create Jobs, Strengthen Supply Chains, and Counter China](#), August 2022.
9. White House, [Building a Clean Energy Economy. A Guidebook to the Inflation Reduction Act's Investments in Clean Energy and Climate Action](#), January 2023.
10. See Brookings Institute, [Economic Implications of the Climate Provisions of the Inflation Reduction Act](#), March 2023.
11. European Commission, [Press statement by President von der Leyen on the outcomes of today's College meeting](#), June 2023.



12. See European Commission, [An EU approach to enhance economic security](#), press release, June 2023.
13. See European Commission, [The Green Deal Industrial Plan. Putting Europe's net-zero industry in the lead](#), February 2023.
14. Center for Security and Emerging Technology, Georgetown University, Translation of [China's 14th Five-Year Plan, covering the years 2021-2025, as passed by the Chinese Parliament, the National People's Congress](#), March 2021.
15. White House, Fact Sheet, [Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence](#), October 30, 2023.
16. White House, [Fact Sheet, Biden-Harris Administration Secures Voluntary Commitments from Leading Artificial Intelligence Companies to Manage the Risks Posed by AI](#), July 2023.
17. European Parliament, [EU AI Act: First regulation on artificial intelligence](#), June 2023.
18. See reports in *Time*, [China Wants to Regulate Its Artificial Intelligence Sector Without Crushing It](#), August 14, 2023, and Bloomberg, [China Takes Friendlier Approach to AI in Finalized Guidelines](#), July 13, 2023.
19. Matt Sheehan, Carnegie Endowment for International Peace, [China's AI Regulations and How They Get Made](#), July 2023. See also Angela Huyue Zhang, [Chinese Regulators Give AI Firms a Helping Hand](#), Project Syndicate, October 2023.
20. Government of the United Kingdom, [The Bletchley Declaration by Countries Attending the AI Safety Summit](#), November 2023.
21. WIPO, [IP Facts and Figures](#).
22. Note that the chart representing patent filings per GDP measures proportionate filings of patent *families*, representing filings in more than one jurisdiction. This causes China to drop from the list of global leaders because, as shown in Table 5.1, the vast majority of Chinese patents are currently filed in China only.
23. Government of Canada, [Canada Innovation Corporation: Blueprint](#), February 2023.
24. See Canadian Intellectual Property Office, [Processing Artificial Intelligence: Highlighting the Canadian Patent Landscape](#), 2019.
25. World Intellectual Property Organization, [WIPO Technology Trends 2019 – Artificial Intelligence](#), 2019.
26. Deloitte, [Impact and opportunities: Canada's AI ecosystem – 2023](#), Report produced on behalf of CIFAR, Amii, Mila and the Vector Institute, September 2023.
27. Canadian Intellectual Property Office, [Patent statistics: 2021 to 2022](#).
28. See International Energy Agency, [Patents and the Energy Transition, Global trends in clean energy technology innovation](#), Statistics report, April 2021.
29. A Science Policy for Canada: Report of the Senate Special Committee on Science Policy, Chair; The Honourable Maurice Lamontagne, 1973.
30. Council of Canadian Academies, Expert Panel on Business Innovation, [Innovation and Business Strategy: Why Canada Falls Short](#), April 2009.
31. Government of Canada, [Innovation Canada: A Call to Action](#), Review of Federal Support to Research and Development – Expert Panel Report, 2011.
32. The follow-through by the Government of Canada on what was called the Jenkins report is usefully reviewed in a report authored by Andrei Sulzenko for the Institute of Research on Public Policy in 2016: [Canada's Innovation Conundrum: Five Years After the Jenkins Report](#).
33. Government of Canada, [Budget 2016, Chapter 2](#).
34. Government of Canada, [Advisory Council on Economic Growth, Unlocking Innovation to Drive Scale and Growth](#), February 2017.
35. Innovation, Science and Economic Development Canada, Restart, recover, and reimagine prosperity for all Canadians. An ambitious growth plan for building a digital, sustainable and innovative economy. A report from the Industry Strategy Council.
36. Senate of Canada, Standing Committee on Banking, Commerce and the Economy, [Needed: An innovation strategy for the data-driven economy](#), June 2023.

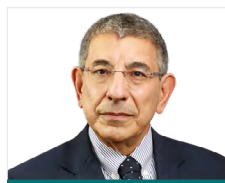
Contributors:

Public Policy Group



David A. Dodge, O.C.
613.683.2304
dodged@bennettjones.com

David is a Senior Advisor at Bennett Jones. Immediately prior to joining Bennett Jones in 2008, he served as Governor of the Bank of Canada from February 2001 to January 2008. Before that, he served in a number of senior positions at the Department of Finance including Deputy Minister from 1992 to 1997, and G7 Deputy. Since 2008, he has served on a number of corporate and not-for-profit boards and currently chairs the National Council of the C.D. Howe Institute.



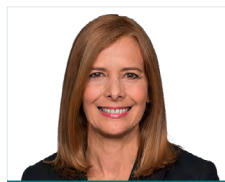
Jonathan Fried
613.683.2319
friedj@bennettjones.com

Jonathan is a Senior Advisor at Bennett Jones. He helps advise clients in navigating international trade and financial regulations and frameworks. He was the personal representative of Canada's Prime Minister for the G20 and the Coordinator for International Economic Relations with Global Affairs Canada from 2017-20. He also served as Canada's WTO Ambassador (2012-17), Canadian Ambassador to Japan, and Executive Director for Canada, Ireland and the Caribbean at the IMF. Jonathan was formerly Canada's Chief Negotiator on China's WTO accession and Canada's Chief NAFTA Counsel. In 2022, Jonathan was honoured by the Government of Japan with the Order of the Rising Sun, Gold and Silver Stars, one of the highest honors bestowed on foreign citizens.



Serge Dupont
613.683.2310
duponts@bennettjones.com

Serge is a Senior Advisor at Bennett Jones. Before joining the firm in 2018, he was a senior executive in the Government of Canada with close to 35 years of experience in economic and financial policy. Serge served in 2016-17 as Deputy Clerk of the Privy Council and Deputy Minister of Intergovernmental Affairs. Serge also served as Executive Director for Canada, Ireland and the Caribbean in the IMF; as Deputy Minister, Natural Resources Canada; and in senior positions in Finance Canada.



Lori Sterling
416.777.5522
sterlingl@bennettjones.com

Lori is Senior Counsel at Bennett Jones. She most recently served as Canada's Deputy Minister of Labour and Associate Deputy Minister, Employment, Skills Development Canada. As Deputy Minister of Indigenous Affairs, Lori helped create Ontario's first Ministry for Indigenous peoples. Lori has also served as the Associate Deputy Minister of Justice for Canada and as the Assistant Deputy Minister for Legal Services in Ontario. She has appeared as litigation counsel at all levels, including 15 cases before the Supreme Court of Canada. Lori is a member of the Institute of Corporate Directors. She acts as a board chair at Windmill Microlending and at Pearson United World College, board director at the Spark Centre for Innovation, and chair of the Legal and Regulatory Committee of PEN Canada.



Claire M.C. Kennedy
416.777.6150
kennedyc@bennettjones.com

Claire is Senior Advisor, Clients and Industries at Bennett Jones and has been recognized as one of Canada's leading lawyers in tax and transfer pricing. She is also a seasoned board director and a professional engineer. Claire is Lead Director of the Bank of Canada, the nation's central bank. She is Chair of Neo Performance Materials Inc., a producer of rare earth products and metals essential for future facing technologies, and a director of Alamos Gold Inc., a North Americas focused gold producer and of Constellation Software Inc., a Canadian headquartered company that acquires and holds vertical market software (VMS) businesses. Claire was a Governor of University of Toronto from 2012 to 2021, including four years as Chair of the Governing Council.



Richard Dion
613.683.2312
dionr@bennettjones.com

Richard is a Senior Business Advisor at Bennett Jones, specializing in economic analysis and forecasting for Canadian and international businesses. Prior to joining the firm, Richard worked as an economist for the Bank of Canada (for over 30 years in various departments), the Department of Foreign Affairs and International Trade, and Energy, Mines and Resources Canada.



Hon. John R. Baird P.C.

416.777.5767
bairdj@bennettjones.com

John is a Senior Business Advisor at Bennett Jones. Recognized for his influential role in bilateral trade and investment relationships, he has actively engaged in the Canada-China dialogue and strengthened ties with ASEAN countries. As a former Senior Cabinet Minister in the Government of Canada with extensive experience as Foreign Minister and other key positions, John has demonstrated his commitment to enhancing security and economic partnerships with the United States and Middle Eastern nations. John currently sits on the advisory board of Barrick Gold Corp., the corporate boards of Canadian Pacific Kansas City Limited (CPKC), Canfor Corporation (as Chair), Osisko Gold Royalties, the FWD Group and PineBridge Investments.



Hon. Jason Kenney PC, ECA

403.298.3027
kenneyj@bennettjones.com

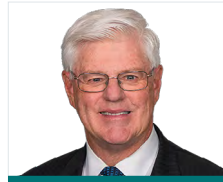
Jason is a Senior Advisor at Bennett Jones. As the 18th Premier of Alberta, and with extensive experience in federal and provincial elected offices spanning over 25 years, he has demonstrated exceptional leadership, vision, and public policy expertise. His initiatives as Premier, such as the Alberta Recovery Plan and the Alberta Indigenous Opportunities Corporation, have created new opportunities for economic development and investment. While serving as an MP, Jason held several key federal positions, including Minister of National Defence and Minister of Employment and Social Development. Jason serves as a Board Director for several corporations, including ATCO Ltd., Fairfax India, People's Trust Group and CORIL Holdings.



Hon. Christy Clark

604.891.5160
clarkc@bennettjones.com

Christy is a Senior Advisor at Bennett Jones. As the former Premier of British Columbia, she achieved exceptional economic growth, fiscal management, and job creation during her tenure. Under her leadership, British Columbia became Canada's economic leader for three consecutive years. With a remarkable track record of balancing budgets and reducing public debt, Christy's legacy is one of longterm planning and sustainable prosperity for future generations. Christy is Board Director of Shaw Communications, Chair of CN Rail's Vancouver Community Board and Co-Chair of the Advisory Board of the Max Bell School of Private Policy.



Hon. John P. Manley, P.C., O.C.

613.683.2320
manleyj@bennettjones.com

John is a Senior Business Advisor at Bennett Jones. For over a decade, he served in the federal government as Canada's Deputy Prime Minister, Minister of Foreign Affairs, Finance Minister and Industry Minister. He was President and Chief Executive Officer of the Business Council of Canada (formerly the Canadian Council of Chief Executives), representing the CEOs of leading Canadian corporations. John advises clients and helps them succeed through his years of experience in government and business, and his understanding of strategic business opportunities. He is the current Chair of the Board of Directors of TELUS Corp., as well as Chair of the Advisory Council of the Canadian Global Affairs Institute and Jefferies Financial Canada.



Edward S. Goldenberg, C.M.

613.683.2301
goldenberge@bennettjones.com

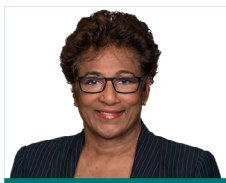
Eddie is Co-head of Bennett Jones' Government Affairs and Public Policy practice. He has a corporate practice, advising clients on governance issues, public policy and government relations in Canada and abroad. Eddie has a distinguished background working with the Government of Canada, having been the Senior Policy Advisor to the Prime Minister of Canada, the Right Honourable Jean Chretien (1993-2003) and the Prime Minister's Chief of Staff (2003). Eddie has worked in all major economic departments of the federal government and acted as Special Constitutional Advisor to the Minister of Justice from 1980-82.



Hon. A. Anne McLellan, P.C., O.C., A.O.E.

780.969.2648
mclellana@bennettjones.com

Anne is a Senior Advisor at Bennett Jones. She provides national and international strategic planning assistance to the firm's clients. During her distinguished career in federal politics, she served as Deputy Prime Minister of Canada, Minister of Public Safety and Emergency Preparedness, Minister of Health, Minister of Justice and Attorney General of Canada and Minister of Natural Resources and Federal Interlocutor for Metis and Non-Status Indians. Anne chairs numerous boards—including the Institute for Research for Public Policy and the TELUS Edmonton Community Board—and is co-chair of the Advisory Council of the Coalition for a Better Future.



**Dr. Indira V. Samarasekera
PhD, FRSC, FCAE, DSc, O.C.**

604.891.5152
samarasekerai@bennettjones.com

Indira is a Senior Advisor at Bennett Jones. She is an internationally acclaimed metallurgical engineer, and brings her expertise in mining, oil and gas, and environmental matters to clients seeking advice in these fields. Indira serves on the boards of Scotiabank and Magna International, and contributes to various foundations and advisory boards, exemplifying her commitment to advancing Canada's economic landscape.

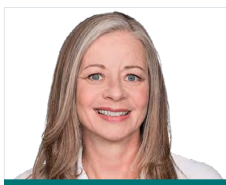


Enzo J. Barichello KC

780.917.4269

barichelloe@bennettjones.com

Enzo is a Partner and Co-head of the Government Affairs and Public Policy practice at Bennett Jones. He is also Chair of Edmonton Global, engaged in seeking foreign direct investment and trade for the economic benefit of the greater Edmonton Capital Region. Enzo's expertise in commercial transactions and mergers and acquisitions has played a vital role in facilitating economic growth across diverse sectors such as pharmaceuticals, real estate, telecommunications, and energy. His contributions extend beyond legal counsel, as he serves on corporate boards and has held positions in prominent organizations such as MacEwan University and the Edmonton Regional Airports Authority.



Jane Bird

604.891.5156

birdja@bennettjones.com

Jane is a Senior Business Advisor at Bennett Jones. She provides expertise to private and public sector clients in infrastructure project development and execution. With a remarkable career spanning 20 years, she has led major projects in transportation, power, building, and wastewater sectors. Notable achievements include the construction of the Canada Line, a significant public-private partnership rapid transit line, and the development of the Waneta Expansion Project, a hydroelectric generating station. Jane's exceptional leadership has been recognized through prestigious awards, highlighting her influential role in the industry. Jane chairs the board of Nieuport Aviation, an investment of the Infrastructure Investment Fund, a NY infrastructure fund.

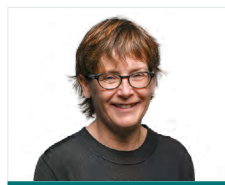


Michael Horgan

613.683.2309

horganm@bennettjones.com

Michael is a Senior Advisor at Bennett Jones. Prior to joining the firm, Michael held several high-level positions, including Deputy Minister of Finance, Government of Canada; Executive Director for the Canadian, Irish and Caribbean Constituency, IMF; Deputy Minister of the Environment; Deputy Minister of Indian Affairs and Northern Development, Government of Canada and President of the Atlantic Canada Opportunities Agency (ACOA).



Laurie C. Wright

613.683.2303

wrightl@bennettjones.com

Laurie is a Senior Counsel at Bennett Jones. As a former senior leader with Canada's Department of Justice, Laurie developed legal policy and law reform initiatives, and provided expert and specialized legal advice, gaining 30 years of experience in the federal government, across a broad range of issues and departments, with knowledge of specialized areas of public law and of government processes.



Bennett Jones

The firm that businesses trust
with their most complex legal matters.