U15 Canada

Driving Innovation

Canada's Leading Research Universities and the Path to Home-Grown Prosperity

February 2025

Introduction

Canada stands at a crossroads. Global pressures are mounting, including an accelerating digital transformation, AI-driven disruption, increasing geopolitical uncertainty, and the shift toward a decarbonized economy. These pressures are reshaping industries and economies at an unprecedented pace. Canada must secure our collective economic and technological sovereignty without dependence on previously reliable partners. This will require a serious effort to address productivity, create wealth and grow economic opportunities for people and businesses in Canada.

More than ever, a country's economic prosperity is tied to the ambition and ability of its businesses to develop, adopt, and deploy new products, processes, and technologies. This ability depends on highly qualified, talented individuals who can tap the global pool of knowledge to propose innovations for specific companies and communities. Canada can no longer rely on importing innovative ideas and technologies to address the needs and challenges of Canadian industry. We need to retain and attract highly qualified talent in Canada with the knowledge and expertise to ensure we remain resilient and adaptable in an uncertain future. It is time to build home-grown prosperity.

Canada has the capacity and potential to succeed through these transformations, but our economy faces distinct structural conditions. The country's economy is heavily reliant on small and medium-sized enterprises (SMEs) and multinational subsidiaries, making it vulnerable to shifts in global trade, investment patterns, and technological disruptions. This reliance has been dramatically exposed by the threat of trade wars and disrupted international supply networks. The 21st century is making clear that domestic capacity must underpin economic security and national sovereignty.

Companies face uncertainty, talent shortages, and limited access to growth capital, all of which undermine Canada's capacity for innovation-led growth. The good news is that Canada's leading research universities are well-positioned to help strengthen the innovation ecosystem. As highlighted in U15 Canada's recent paper, *Developing Talent: Canada's Leading Research Universities and How We Close the Talent Gap*, these universities are essential to attracting, developing, and retaining the talent Canada needs. They also account for over 75% of all industry-sponsored R&D, helping thousands of companies innovate and spinning out world-leading startups that will fuel the industries of tomorrow. By providing solutions Canadian businesses need, leading research universities help drive innovation and accelerate the adoption of new products, processes, and technologies, including AI and other digital tools.

Canada already has many of the foundational elements for a successful and vibrant innovation system. The priority now must be to scale promising industry-academic collaborations, reinforce Canada's research commercialization pipeline, and develop a cohesive national strategy that aligns government, industry, and academia with a shared goal of delivering growth, productivity, and impact for Canadians. Doing so will enhance Canada's innovation capacity, accelerate technology adoption, and secure long-term economic prosperity in a time of rapid change. The result will be a stronger, more prosperous, and resilient Canada.

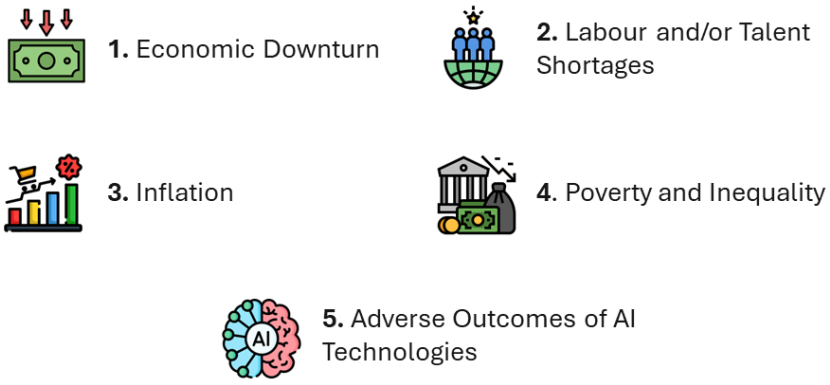
Canada's Innovation Imperative in an Era of Global Uncertainty

Innovation is the foundation of a strong, competitive economy, driving industrial productivity, community resilience, and long-term prosperity. Today, the urgency to innovate has never been greater as the global economy undergoes seismic shifts reshaping industries, supply chains, and economic leadership. However, innovation is a complex process that involves multiple actors—including government, higher education, and industry—operating within interconnected feedback loops, funding mechanisms, and support structures.

These complex dynamics are further complicated by global trends reshaping the economic landscape. Decarbonization, the digital revolution, and the disruptive forces of the AI revolution are redefining how businesses operate, while geopolitical and economic uncertainties—from deglobalization to heightened trade tensions between formerly reliable partners—are forcing countries to secure technological independence and protect critical industries. Countries are racing to attract top-tier talent, safeguard intellectual sovereignty through reduced reliance on foreign supply chains and maintain competitiveness in an era of rapid technological transformation.

Amid these global pressures, Canada faces its own distinct challenges. Growing fears of economic downturn, strained trade relations, talent shortages, inflation, and concerns around AI top the country's near-term risk landscape.[i] In the longer-term, these challenges will intersect with broader global issues such as climate change, social inequality, the spread of disinformation, and increasing technological disruption.

Figure 1: Canada's Top Five Near-Term Risks



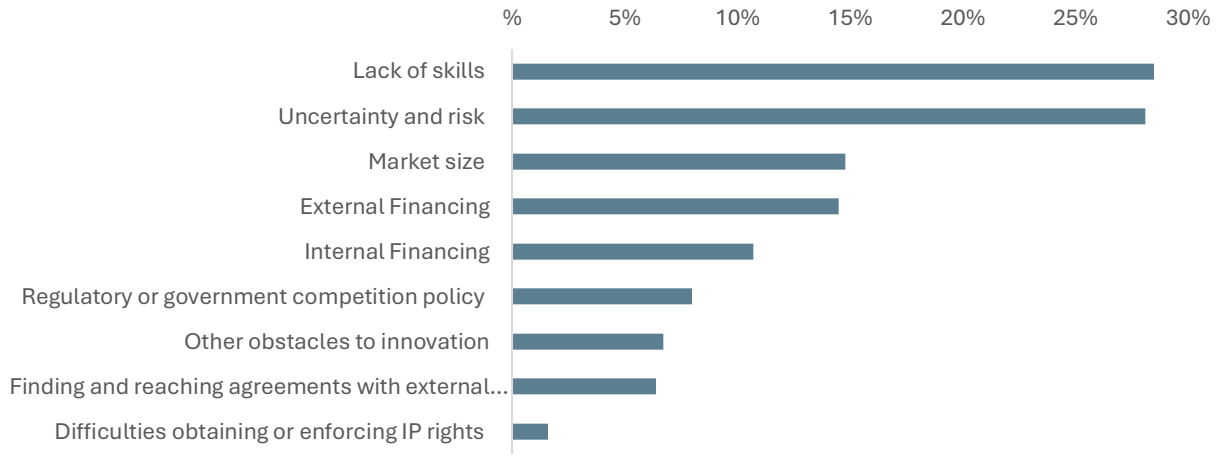
These risks only compound Canada's ongoing innovation and productivity challenges, which have long been the focus of economists, policymakers, and industry leaders. Canada consistently ranks below its peers in R&D intensity, private sector innovation, patent outputs, and technology adoption. In 2022, R&D expenditures stood at 1.71% of GDP, well below the OECD average of 2.73%, and Canada remains the only G7 country investing less in R&D today (as a share of GDP) than it did in 2000.[ii]

And while R&D expenditures are not the be-all and end-all of innovation, they are a critical indicator feeding into the conversation on productivity and economic growth. Investment in R&D fuels technological progress, intangible capital, and efficiency gains—key factors behind GDP and productivity growth across the OECD for decades.[iii]

However, despite the clear link, many Canadian businesses are hesitant to invest, citing challenging barriers, rising uncertainty, and a lack of expertise in developing new products and adopting advanced and emerging technologies.

Statistics Canada reported that the number of businesses conducting in-house R&D in Canada declined from 18,821 in 2015 to 17,550 in 2022, while more than half cited innovation obstacles such high costs, limited expertise, and infrastructure.[iv] Among these, talent shortages, uncertainty, and risk remain the most significant innovation barriers for firms (see Figure 2).[v] These barriers highlight the growing need for collaborative innovation ecosystems that connect firms with cutting-edge expertise, research infrastructure, and highly qualified talent.

Figure 2: Business Innovation Obstacles (% of Firms, 2020 to 2022)



Greater collaboration and coordination will help Canada's SME-dominated economy, where 98% of employer businesses have fewer than 100 employees, and nearly 57% have fewer than five. Only 3,377 enterprises nationwide employ more than 500 people—over 1,300 of which are public universities, colleges, healthcare services, or government administrations.[vi] Moreover, over a third of in-house business R&D spending in Canada is through foreign-controlled companies.[vii]

This business landscape presents structural hurdles for scaling Canadian innovation, as smaller firms often lack the internal capacity, infrastructure, and expertise for sustained R&D investment. Despite these challenges, the critical role of research-intensive universities in helping drive industry innovation is often overlooked. Canada's leading research universities are already solving industrial R&D challenges, de-risking investments, and providing the expertise needed to help businesses adopt new technologies, scale, and compete globally. Strengthening these partnerships will be essential to solve lingering obstacles and maximize Canada's innovative potential.

Catalyzing Industry Innovation Through Research-Intensive Universities

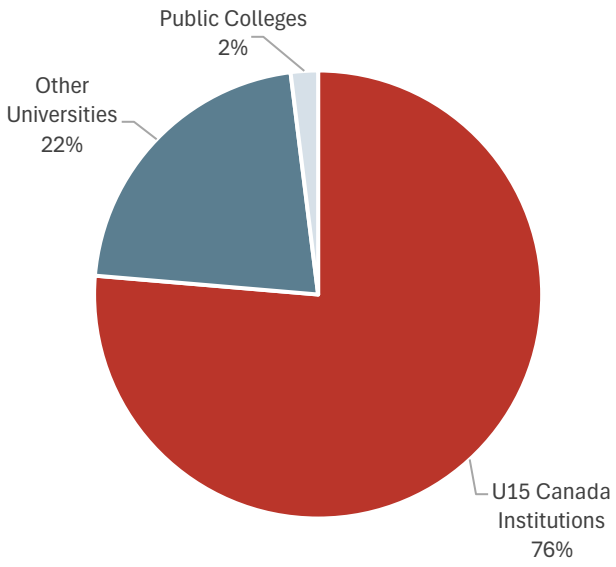
Innovation ecosystems are shaped by national economic structures, reflecting local activities and requiring contextualised R&D strategies. The U.S. drives innovation through large multinationals, deep capital markets, and high-risk venture funding, while Germany's *Mittelstand* relies on specialized mid-sized firms supported by applied research institutions like the Fraunhofer Society. Canada, with its mix of SMEs, multinational subsidiaries, and regional economic diversity and

siloes, has built its innovation system to rely on the expertise and capacity of leading research universities. Since the mid-1990s, our universities have served as hubs for talent creation and attraction, R&D, technology transfer, and industry collaboration.

Consequently, partnerships between Canadian academia and industry have been growing significantly. From 2020 to 2022, 17.6% of Canadian businesses engaged in research collaborations with post-secondary institutions.[viii] Canadian businesses fund a greater share of higher education R&D than the OECD average, with Canada ranking third in the G7 for the proportion of industry-sponsored research.[ix] At the heart of these growing partnerships are U15 Canada universities, which Canadian businesses have relied upon for their talent, expertise and infrastructure.

In 2022/23 alone, U15 Canada universities conducted $866 million in industry-sponsored R&D, representing 76% of the more than $1.1 billion in total R&D partnerships between higher education and the private sector from coast to coast to coast. Moreover, these collaborations continue to grow rapidly, deepening with established partners and forging new relationships. Industry-sponsored research investment at U15 Canada universities has grown by 44% since 2010, driving innovation and solving industrial challenges across Canada.[x]

Figure 3: Share of Industry-Sponsored Research Income Across Higher Education (Grants and Donations, 2022/2023)



Federal research agency support has been instrumental in strengthening these collaborations, funding thousands of industry-academic partnerships that drive innovation and commercialization. Programs like NSERC's collaborative R&D initiatives connect businesses with researchers, accelerating technology transfer and entrepreneurial development. Over the past decade, SSHRC-supported projects alone have attracted nearly $200 million in industry contributions, underscoring the private sector's confidence in university-led research.[xi] In 2022/23, U15 Canada researchers partnered with over 3,600 organizations on federally funded grants, including more than 1,200 industry collaborators, leveraging federal funding to foster innovation that reaches communities in 325 federal ridings across Canada.[xii]

Advanced laboratories, high-performance computing, and specialized equipment enable efficient, cost-effective industrial support. For instance, the University of British Columbia supports over 1,300 annual industry partnerships, including 350 collaborations with BC-based businesses.[xiii] These partnerships also help de-risk industry R&D investments by sharing costs and facilitating access to public funding programs. U15 Canada has actively developed digital products, such as COGNIT.ca, that help connect businesses with the expertise and infrastructure they need to develop products or services.[xiv]

Figure 4: Business Partners on U15 Canada Tri-Agency Grants (2022/2023)

Despite AI's benefits—97% of SMEs surveyed by BDC using AI report increased efficiency, cost savings, and higher sales—adoption in Canada remains low, with only 6.1% of businesses using AI as of early 2024, up from 3.1% in 2022. High costs, talent shortages, and integration challenges remain significant barriers, with 40.6% of firms citing low returns on investment and 36.7% struggling to recruit skilled workers. Leading research universities are bridging this gap by accelerating AI adoption through industry collaboration. Programs with U15 Canada universities like Amii, Mila, and Vector's FastLane are actively supporting commercialization, helping hundreds of Canadian companies integrate AI into their operations.[xv]

The growing impact of these types of industry-academic collaborations is clear. For example, a Statistics Canada analysis of Mitacs programs reveals that companies collaborating with academic researchers and graduate students through Mitacs experience significant economic benefits. By the third year after the partnership, these firms see average increases of 9% in total revenue, 16% in sales, and 11% in labour productivity. Additionally, Mitacs-supported companies tend to hire more employees and invest more in R&D over time, contrasting the stagnating economy-wide trend.[xvi]

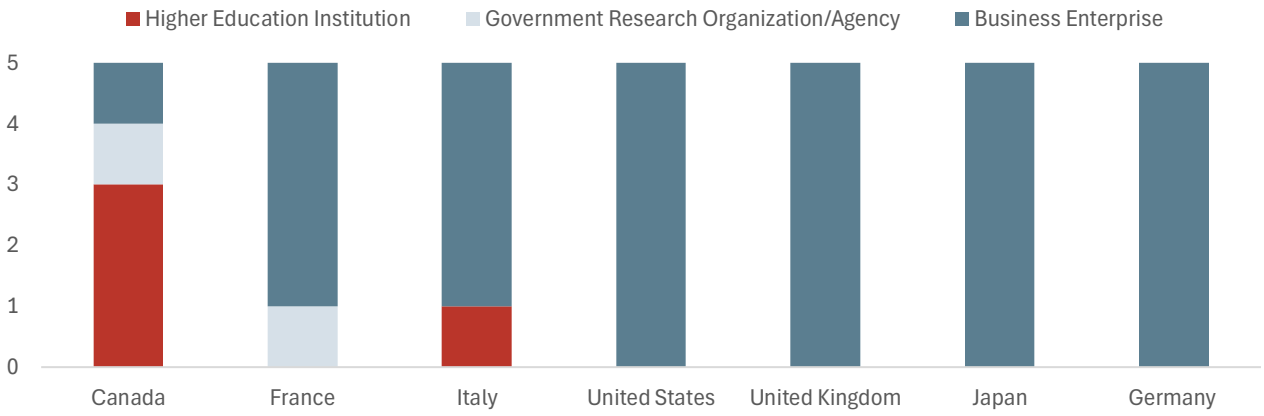
To fully harness the potential of the country's innovation enterprise and leading research universities, Canada must scale and strengthen industry-academic partnerships. Expanding access to world-leading expertise and cutting-edge infrastructure will allow more businesses to leverage research-driven solutions, accelerate commercialization, and drive economic growth.

Driving Innovation Through Startups and Sectoral Transformation

In addition to directly supporting industrial R&D, leading research universities are driving innovation through commercialization, spinouts, and transformative sectoral advancements. Since 2010, U15 Canada universities have been key drivers of intellectual property (IP) development in Canada, reporting 18,000+ invention disclosures, 11,000+ patent applications, and maintaining thousands of active technology licenses.[xvii] Between 2021 and 2023, three U15 Canada universities and affiliated hospitals ranked among Canada's top five Patent Cooperation Treaty (PCT) applicants. In Canada, research universities lead PCT patent filings, unlike in other G7 countries where

businesses dominate, illustrating how Canada's innovation ecosystem is centred on university-led research to drive breakthroughs and commercialize new technologies. [xviii]

Figure 5: Top Five PCT Patent Applicants by Type (2021-2023)

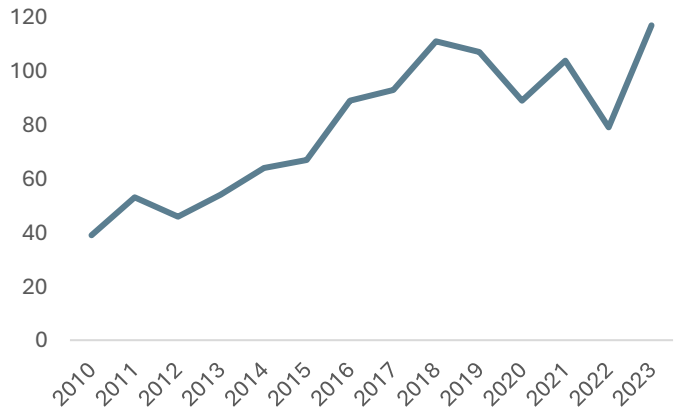


Beyond patents and licensing, universities are increasingly spinning out companies, translating academic discoveries into commercial success. Since 2010, U15 Canada universities and affiliated research hospitals have launched over 1,100 research-based startups, including nearly 120 in 2023 alone (see Figure 6).[xix] That year alone, McGill University launched more research-based startups than any other university in North America. This success underlines how university led research is driving home grown economic prosperity in Canada.

For example, Fusion Pharmaceuticals, a McMaster University spinout, has grown into a clinical-stage biopharmaceutical leader, pioneering next-generation radioconjugates—precision medicine therapies that deliver targeted radiation directly to cancer cells.[xx] With research and manufacturing operations in Canada and the U.S., including a state-of-the-art facility at McMaster Innovation Park, Fusion exemplifies how university-led innovation translates into commercial success.

Outside of research spinouts, leading research universities also serve as broader hubs of entrepreneurial activity, supporting a wide range of ventures and business creation. For example, over the past five years, the University of Toronto's community, supported by over 12 campus accelerators, has launched more than 1,200 venture-backed startups that have collectively raised over $12 billion and created more than 17,000 jobs.[xxi]

Figure 6: U15 Canada Research Startups Created by Year



This surge in startup creation reflects an increased focus on supporting the commercialization of academic discoveries at Canada's leading research universities. However, ensuring these startups have the necessary support and pathways to scale remains a critical challenge in Canada. While leading research universities have a role

in engaging with and supporting firms as they enter the scale-up phase, efforts from policymakers to ensure more integrated and strategic alignment between federal innovation policy and university research support policy is needed. Better collaboration across the innovation ecosystem—including improved access to capital, talent, mentorship, and markets—can help these companies transition from early success to sustainable growth, enabling them to reach their full potential and contribute meaningfully to Canada's innovation economy.

The broader impact of research-intensive universities extends beyond individual startups, driving advancements across key industries. The Toronto Academic Health Science Network (TAHSN), anchored by the University of Toronto, has propelled Canada's life sciences sector to global prominence, attracting $2.2 billion in investments for life sciences startups over the past five years.[xxii] As a hub for clinical trials and pharmaceutical partnerships, TAHSN is at the forefront of breakthroughs in AI-powered diagnostics, regenerative therapies, and novel treatments that address critical health challenges.

Similarly, the Crop Development Centre (CDC) at the University of Saskatchewan has revolutionized Canadian agriculture, releasing over five hundred crop varieties, contributing $18 billion to gross farm output since 1991, supporting nearly 7,000 jobs, and advancing global food security. Its innovations in lentil and barley strains now dominate Canadian farmland, with CDC strains accounting for 99.9% and 49% of planted area, respectively.[xxiii]

The advanced capabilities housed within the country's leading research universities—from nuclear science and cybersecurity to agriculture, quantum technologies, and artificial intelligence—will be essential for equipping Canadian industries with the expertise, infrastructure, and innovations they need to thrive today, tomorrow, and beyond.

A Collaborative Path to Innovation and Economic Resilience

Canada's leading research universities help underpin the country's innovation ecosystem, fostering talent, driving groundbreaking discoveries, and forming transformative industry partnerships that enhance Canada's global competitiveness. However, realizing the full potential of this ecosystem requires scaling and deepening collaboration across government, industry, and academia, expanding the feedback loops between research, commercialization, and industry adoption.

Canada needs a holistic industrial and innovation strategy that builds on existing strengths, addresses weaknesses, and scales collaborations and solutions. However, this strategy should not focus solely on individual ingredients, sectors, or technologies but rather on reinforcing the interconnections and feedback loops that drive innovation and economic growth.

In a turbulent time, now is the moment for concerted action. By leveraging and expanding the partnerships that have long existed between leading research universities and industry, aligning public and private sector efforts, and strategically investing in research-driven innovation, Canada can build toward a more prosperous future in a time of great uncertainty. Leading research universities and the world-leading researchers at U15 Canada universities are ready to work on solutions for a stronger, more resilient, and more prosperous Canada.

Endnotes

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