



Canada's Innovation Strategy Development

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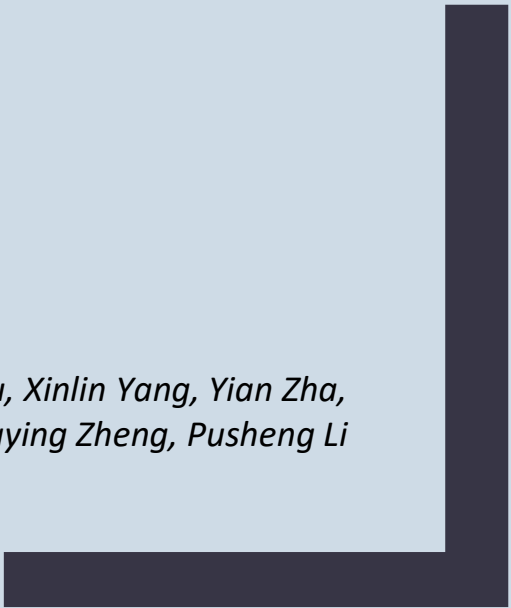


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Introduction

In an era defined by rapid change, innovation is crucial for economic prosperity and enhancing quality of life. As new technologies revolutionize our daily existence and we face significant challenges such as climate change and health emergencies, it's imperative for nations to quickly devise smart, innovative solutions.

The Global Innovation Index (GII) published by World Intellectual Property Organization (WIPO) serves as a benchmark, evaluating how adept countries are at fostering innovation. This index assesses a myriad of factors to determine each country's innovation prowess. Currently, Canada sits at 15th place [1], indicating solid performance with room for improvement.

This report examines Canada's position in the innovation landscape, identifying strategies employed by the world's leading nations. Our objective is to extract actionable insights from these frontrunners to bolster Canada's ranking. We propose strategic areas for improvement, including research and development (R&D) infrastructure, access to capital, innovation ecosystems, entrepreneurship culture, policies on immigration and intellectual property, sustainable and inclusive innovation, and international collaboration.

Combining global best practices with an analysis of Canada's unique situation, the report outlines a comprehensive strategy aimed not just at enhancing Canada's GI standing but at fostering an economy propelled by innovative, transformative ideas. Our goal transcends improving a ranking; we aim to cultivate a future where innovation significantly uplifts the lives of Canadians.

Data Process

Our analysis is anchored in the rich dataset provided by the WIPO's 2023 GI report, which assesses the innovation capacity of 132 countries through a robust framework of 7 sub-indexes and 80 indicators [1]. This detailed evaluation captures the multifaceted nature of innovation, ranging from infrastructure to policy environment, enabling a granular view of each country's strengths and weaknesses in innovation.

Canada's commendable 15th position underscores its strong innovation ecosystem, yet also highlights significant opportunities for advancement. To hone our focus, we've scrutinized the performance of the top 20 countries, identifying 20 critical indicators that are pivotal to achieving a higher ranking, as shown in Figure 1. This analysis not only reveals the benchmarks set by innovation leaders but also pinpoints the areas where Canada can leverage improvement for maximal impact. Our methodology prioritizes these key indicators, mapping out Canada's current standings shown in Figure 2, and pinpointing the gaps that represent the most promising opportunities for enhancement. Strengths are particularly notable in the realms of university-industry R&D collaboration and QS university ranking in the top 3 (both ranked 7th), underscoring Canada's capacity for fostering collaborative innovation environments in academia. However, the analysis also uncovers critical weaknesses, including the production and export complexity (ranked 43rd) and environmental performance (ranked 42nd), indicating a need for a more diversified economy and improved sustainability practices.

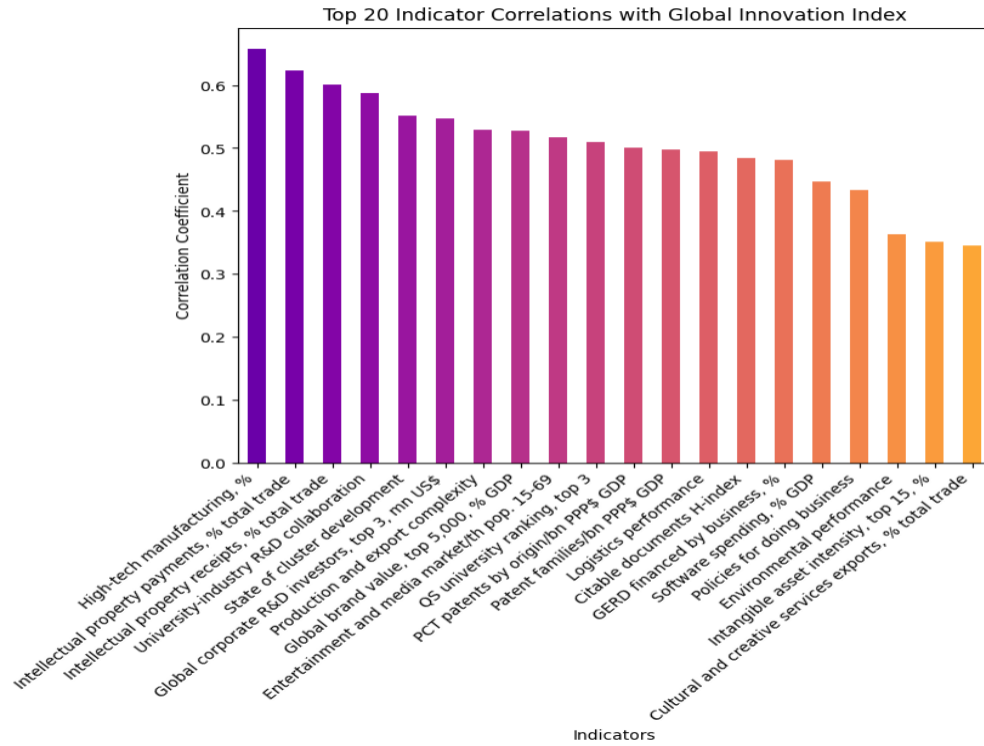


Figure 1. Top 20 Indicator Correlations

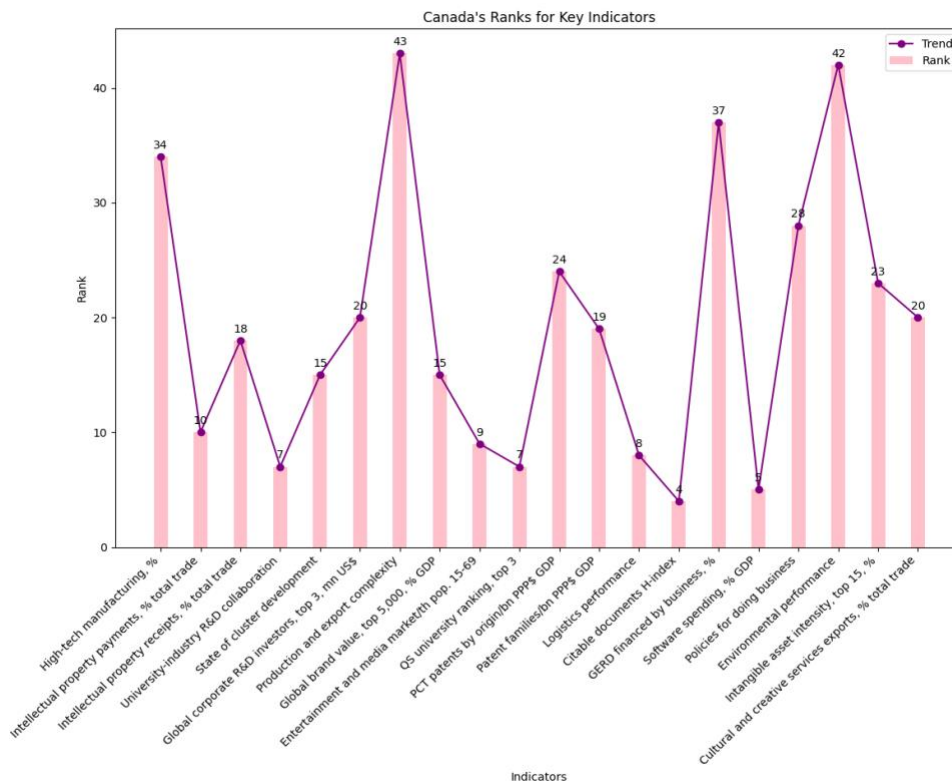


Figure 2. Canada's Ranks for Top 20 Indicators

Analyzing key indicators from the world's innovation leaders offers actionable insights for refining Canada's innovation strategy.

Switzerland exemplifies innovation leadership through its holistic strategy, combining effective policy-making with cutting-edge manufacturing and efficient logistics. Its success in business policy, patenting, and production complexity highlights the value of a business-friendly environment paired with advanced production capabilities.

Sweden's innovation strategy is marked by strong intellectual property protections and environmental commitment, illustrating how innovation can align with societal values. Its emphasis on cultural and creative services exports underscores the importance of intellectual and cultural contributions to the economy.

In the US, a dynamic mix of research clusters and substantial R&D investments from both private and academic sectors propels innovation, particularly in technology and entertainment, showcasing a balanced approach to innovation development.

The UK's innovation landscape features high research quality and investments in software and sustainability, using intangible assets to generate economic value and demonstrating a multifaceted innovation approach.

Singapore stands out for its excellence in high-tech manufacturing, logistics, and creative sector exports, supported by strategic business policies. This approach enhances both production efficiency and global creative industry leadership.

These examples highlight that successful countries tailor their innovation strategies to their unique contexts. Canada can benefit by developing customized strategies that build on its strengths and address specific challenges, drawing lessons from global leaders to enhance its innovation ecosystem. A comprehensive overview of the detailed rankings and features of the top 5 countries can be found in Appendix.

Strengthening R&D Infrastructure

Strengthening Research and Development Infrastructure is a critical strategy for fostering an environment conducive to innovation, economic development, and societal advancement. This approach emphasizes strengthening "Human Capital and Research," a crucial pillar per the Global Innovation Index, to foster innovative activities in the economy. A key indicator identified from our dataset, GERD financed by business, underscores the significance of R&D investments for fostering innovation. For instance, Switzerland, which topped the Global Innovation Index in 2023, allocated approximately 3.4% of its GDP to R&D [2]. Meanwhile, Germany invests around €2.6 billion annually in research [3], which has proven so effective that other nations have emulated it. Given that Canada currently ranks 18th in Gross Expenditure on R&D financed by businesses, we propose to formulate and implement a focused strategy in to enhance Canada's position on the international stage.

According to Statistics Canada, business R&D spending in Canada at approximately 1.7% of GDP (*Appendix 6*) in the past few years [4], lags behind leading innovative countries (*Appendix 7*). To bridge the gap and propel Canada forward, we propose specialized R&D Funding Programs. Starting with conducting comprehensive market research and analysis to identify sectors with high growth potential and capacity for innovation, such as clean technology, digital health, and artificial intelligence. This will help in tailoring the funding programs effectively. The specialized R&D funding programs should include a clear set of incentives, such as tax breaks, grants, and subsidies. The program could offer a 30% tax credit for a wider range of R&D spending in these high-potential sectors compared to the current 30% only available for Critical Mineral Exploration [5]. By emphasizing R&D infrastructure enhancement, the initiative will also promote partnerships between businesses and academia, incentivizing projects that demonstrate collaborative R&D efforts. An awareness campaign will publicize these opportunities, aiming to boost investment in R&D and elevate Canada's global competitiveness in strategic sectors.

Despite Canada's high-quality educational system and strong QS university rankings, it faces challenges in attracting and retaining R&D talent, crucial for global sector competitiveness. While the Global Skills Strategy [6] facilitates quicker entry for skilled workers, there's potential for improvement. A unified strategy to attract and retain R&D professionals is proposed, emphasizing increased funding for research grants in strategic fields. Leveraging LinkedIn, academic journals, and conferences can effectively target these professionals. To further enhance retention, Canada could implement structured career development and progression programs specifically tailored for R&D personnel. These programs would focus on providing clear, attainable pathways for career advancement within academia and industry, ensuring that researchers see long-term opportunities within the country.

Boosting Access to Capital

Access to capital is crucial in fostering innovation at all stages, from early development to expansion into new markets. Early-stage innovations often require significant investment without the promise of immediate returns, while established companies benefit from additional funding to scale innovations and explore new territories. Additionally, financial backing mitigates risks associated with pioneering new technologies or markets. Looking at global best practices, the U.S. supports small businesses through government and private funding, notably via the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs, fostering research and development [7]. Similarly, the Swiss Entrepreneurs Fund collaborates with the government and private sector to finance emerging Swiss companies, emphasizing the importance of supportive ecosystems for innovation [8].

In Canada, the investment landscape showcases a mixed picture. The first half of 2023 witnessed a substantial \$4 billion investment across 335 deals, reflecting strong investor confidence and a commitment to nurturing a robust pipeline of opportunities, despite economic uncertainties [9]. However, projections into 2024 suggest tightening credit markets, making fundraising more challenging for growth-stage companies [10]. To address this, it's recommended to explore the development of innovative financial instruments tailored for growth-stage ventures. Additionally,

enhancing public-private partnerships by establishing co-investment funds, where government and private sector funds are pooled to support emerging sectors, could provide more flexible and accessible funding options for companies navigating through tightening credit markets

Cultivating Innovation Ecosystems and Fostering a Culture of Entrepreneurship

Canada ranks 15th in the State of Cluster Development and 34th in High-Tech Manufacturing, highlighting gaps in its innovation ecosystem and a less pronounced culture of entrepreneurship. Unlike Silicon Valley, which epitomizes the U.S.'s successful innovation cluster by attracting talent and nurturing startups, Canada lacks a centralized tech and innovation hub. Meanwhile, Sweden, a leading innovation economy, benefits from Vinnova, its innovation agency established in 2001, which supports innovative projects with a budget of 3.5 billion and a dedicated team [12]. To enhance Canada's innovation landscape and bolster entrepreneurial spirit, adopting a comprehensive strategy addressing both national and regional facets is crucial.

The Canadian government's Innovation, Science, and Economic Development Portfolio, encompassing eighteen federal departments and agencies, lacks the streamlined approach necessary to efficiently support individuals and companies pursuing innovative projects [13]. A proposed solution is to introduce a holistic online portal as a one-stop resource for capital, mentorship, and networking. This platform would leverage AI to provide personalized advice and facilitate connections, significantly easing the entrepreneurial path. Moreover, integrating an Innovation Resilience Program would support risk-taking, offering financial safeguards like tax breaks or loan forgiveness for failed ventures and resources for skill enhancement and strategy pivoting. This initiative aims to mitigate failure stigma and equip entrepreneurs with the tools for recovery and adaptation, nurturing a resilient, bold entrepreneurial culture.

Between 2016 and 2021, Toronto, Montreal, and Vancouver experienced rapid growth, becoming magnets for tech talent from across the globe [14]. To build on this momentum and push Canada to the forefront of technological and sectoral advancements, there is a compelling case for the establishment of specialized Innovation Districts within these vibrant regional clusters. By zeroing in on emerging technologies, these districts would offer a suite of advanced facilities, secure dedicated funding, and provide regulatory sandboxes designed specifically for experimentation. This strategic move promises not just to attract a plethora of firms and top-tier talent, but also to significantly shorten the timeline for the development of innovative technologies and their introduction to the market. By fostering a conducive environment for growth and innovation, Canada can solidify its position as a global tech hub.

Enhancing Policy Making for Immigration and IP Process

In the global race towards innovation and economic resilience, Canada stands at a pivotal juncture. A nation's policy to attract global talent and streamline intellectual property (IP)

processes plays a crucial role in its innovation ecosystem. Consider, for instance, the United Kingdom's Global Talent Visa, which facilitates internationally recognized leaders in science and technology to work within the UK [15]. Similarly, Singapore's IP Hub Master Plan delineates strategies aimed at establishing the country as a global center for IP registration, protection, and commercialization [16]. These policies lay the groundwork for significant advancements and economic expansion.

Attracting global talent is a cornerstone of Canada's strategy to drive innovation. However, the Global Talent Stream Program, despite its aim to facilitate Canadian employers in hiring international talents, is hampered by a lack of agility and efficiency. The program's process demands considerable time and effort from employers who are required to proactively search for overseas talent with expensive processing fees [17]. To make Canada a top choice for international innovators, a few practical steps can be considered. Introducing a special visa category for tech professionals, researchers, and entrepreneurs offers rapid processing times and reduced bureaucratic hurdles. Physical or virtual hubs can be created in key international locations to promote Canada as an innovation destination, offering information, support, and networking opportunities for potential migrants.

Robust frameworks for IP registration, protection, and commercialization constitute the foundation of a successful innovation ecosystem. The existing support from the Canadian government, which mainly offers guidelines for IP commercialization, needs to be fortified with practical, actionable measures [18]. A specialized agency responsible for guiding innovators through the IP process from registration to commercialization should be established. By redesigning the IP registration workflow to be more user-friendly, with online tools, clear timelines, and transparent fees, the complexity and cost of IP protection can be reduced. Another practical action is to launch nationwide campaigns to educate entrepreneurs and researchers on the importance of IP rights and how to navigate the IP landscape effectively.

Encouraging Sustainable and Inclusive Innovation

Encouraging Sustainable and Inclusive Innovation aims to elevate Canada's innovation ranking by emphasizing environmental performance, a critical driver of innovation. Sweden's government, standing in a leading position (5th rank) in this factor, introduced an ambitious infrastructure bill (2018-2029) focusing on innovative solutions for sustainable development, including efforts to achieve a fossil-free welfare state, enhance housebuilding, and bolster the private sector [19]. These initiatives demonstrate how sustainability can drive economic growth and competitiveness. With Canada ranked 42nd in environmental performance, we introduce the following tailored practical steps to enhance Canada's strength on environmental impact, accelerating innovation growth.

Incentivizing companies and researchers to develop sustainable solutions is a fundamental step to elevate Canada's environmental performance. This could involve introducing tax incentives for investments in green technologies and renewable energy, alongside grants specifically designated for research in these areas. For instance, expanding the Scientific Research and Experimental

Development (SR&ED) program [20] to offer additional credits for sustainability-focused projects could drive innovation. Comparatively, Canada's current incentives are broad and not specifically tailored to encourage green innovation, a gap that this enhanced focus could fill.

Canada can focus on escalating its support for renewable energy projects and green infrastructure development by establishing partnerships with provinces and local governments to co-finance these projects, this partnership ensures a wider and stronger impact. A focused program can be developed to support green initiatives, like urban forestry and sustainable public transportation. This would directly contribute to reducing carbon emissions and enhancing urban livability.

To further foster a culture of sustainable innovation, Canada could develop special financing programs and incubators specifically for green startups. Emulating Sweden's support for the private sector in sustainable development, these programs are designed to provide both financial and mentorship resources to help green startups scale their operations and reach global markets. Presently, Canadian startups in the green sector navigate a fragmented landscape of support; a centralized, well-funded initiative could streamline access to essential resources [22]. Additionally, incorporating sustainability criteria into the evaluation process for all government business grants and incentives would ensure that funding aligns with broader environmental objectives, promoting a holistic approach to innovation and economic development.

Expanding International Collaboration

The "Expanding International Collaboration" strategy aims to enhance Canada's position in two critical areas: global brand value and the export of cultural and creative services. According to Interbrand's 2020 Best Global Brands report, the success of top U.S. companies is largely due to their innovative marketing strategies [23]. Drawing inspiration from the United States, which houses powerhouses like Apple, Google, and Microsoft, having a strong global brand can help elevate Canada's innovative profile, attracting investment and partnerships. By promoting its cultural and creative services globally, Canada aims to diversify trade and highlight its innovation on the world stage. This strategy enhances Canada's innovation ranking by strengthening its international presence and partnerships.

Currently, Canada's engagement in global innovation primarily relies on bilateral agreements and participation in global forums [24]. Despite some effectiveness, these efforts lack the sustained physical presence and dedicated infrastructure that International Innovation Hubs would offer. Location selection targets countries ranked highly in the Global Innovation Index (GII) that also hold promise for Canadian products and services. Following this, partnership is established with local governments in these countries, guaranteeing a seamless integration of the local innovation landscape. Critical investments should be made in the required technological infrastructure and resources, including industry databases, market analysis tools, and access to legal and financial consulting services. These hubs are expected to significantly amplify Canada's role in international R&D collaborations, enhance its global brand in innovation, and facilitate access to new markets,

To amplify Canada's 8th rank in cultural and creative services exports, we should initiate targeted cultural trade missions, facilitating networking, partnerships, and agreements between Canadian

cultural enterprises and their international counterparts. We can also develop a series of international creative residencies that allow Canadian creators and cultural entrepreneurs to work and collaborate in international settings, focusing on fostering cross-cultural innovation and enhancing the global visibility of Canadian creativity.

To adapt to the digital era's impact on trade and work, Canada should boost its digital trade infrastructure. This entails creating digital platforms to simplify cross-border trade and investment, particularly in the services sector, and updating regulatory frameworks to encourage digital trade. These steps will position Canada as an appealing hub for remote workers, aligning its economy more closely with worldwide innovation trends and seizing the opportunities presented by the increasing shift towards digital work.

Conclusion

Examining Canada's innovation landscape reveals significant potential for its ascent on GII. This analysis has identified key strategies to enhance Canada's global innovation stature, including bolstering research and development, facilitating access to financing for novel ideas, and fostering a supportive ecosystem for entrepreneurs.

A critical insight is Canada's opportunity to learn from global innovation leaders. These nations demonstrate the transformative impact of conducive policies, robust support systems, and collaborative environments on innovation. As Canada already stands in a strong position, implementing the discussed strategies could propel Canada higher in GII and pave the way for a future enriched by groundbreaking ideas and technologies. This advancement requires a collaborative effort across government, industry, academia, and communities to not only generate but also scale innovative solutions.

This pursuit of innovation transcends the objective of improving a ranking; it aims to position Canada as a beacon of economic growth, job creation, and environmental sustainability through innovation. This report serves as a call to action and a blueprint for embedding innovation into the fabric of Canadian society, ensuring a prosperous, inclusive future for all.

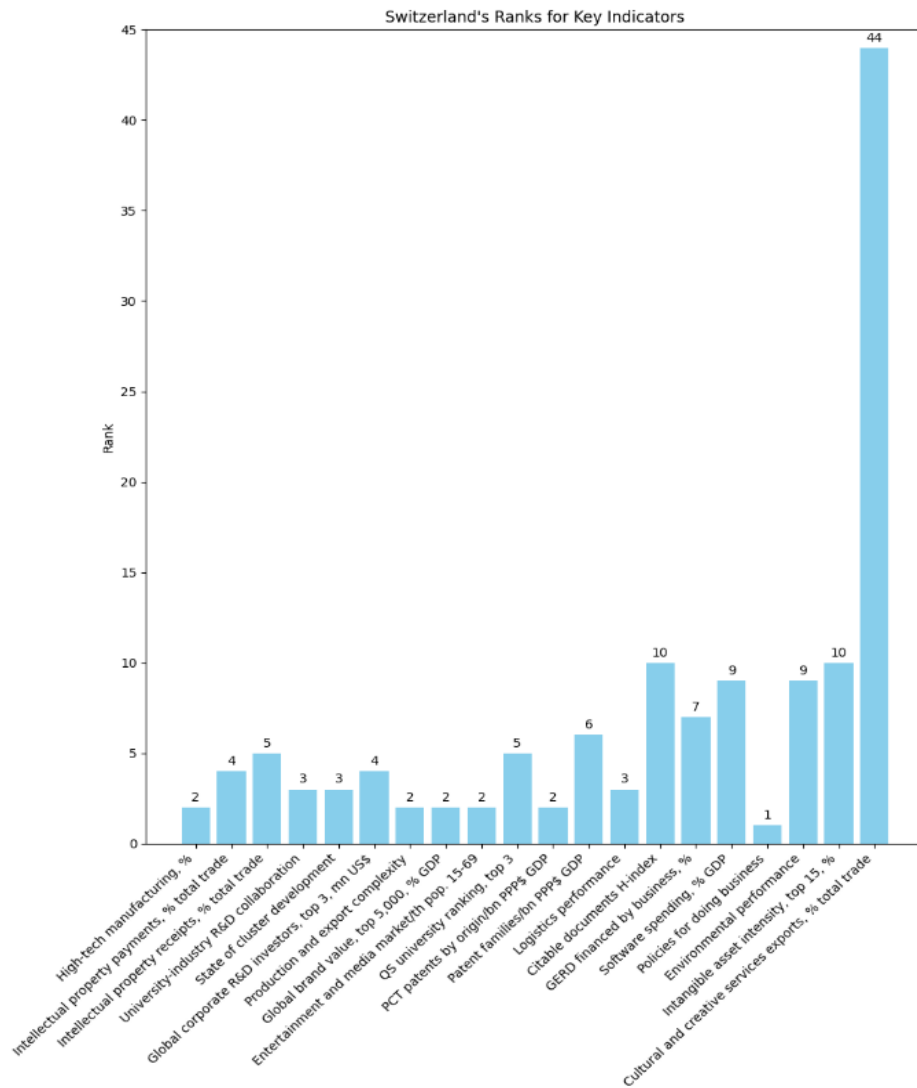
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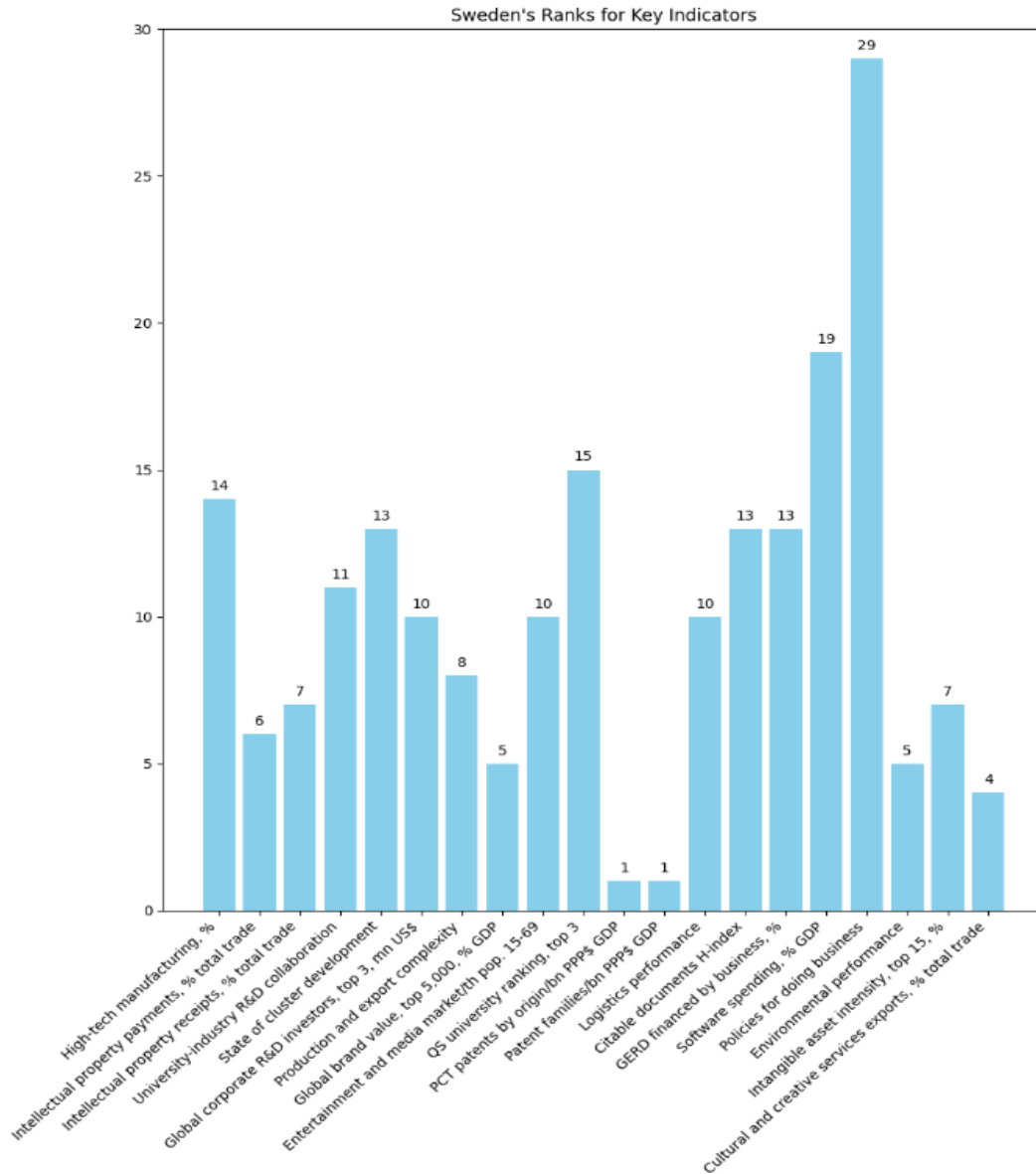
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Appendix

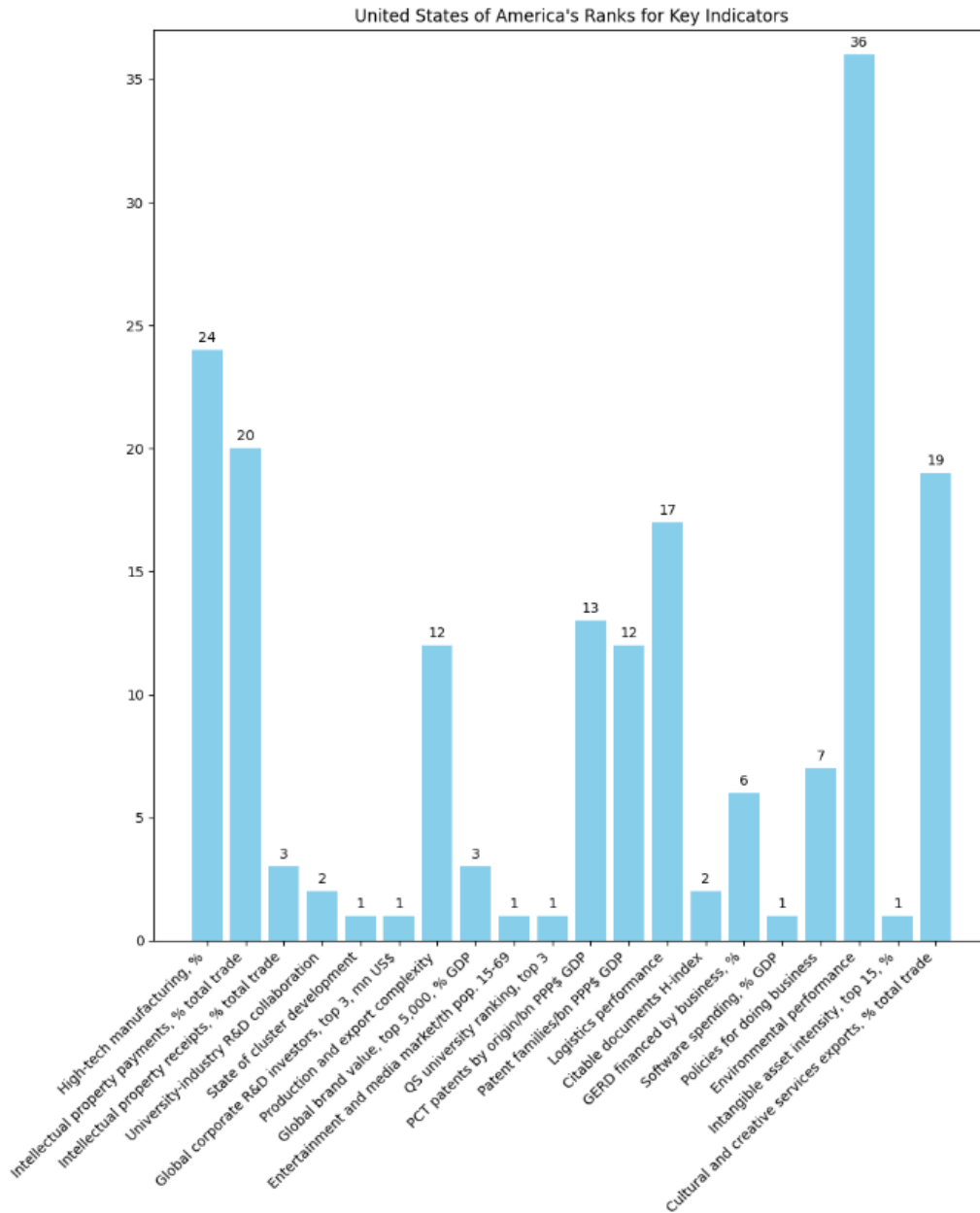
Data Process – Top 5 Countries performance



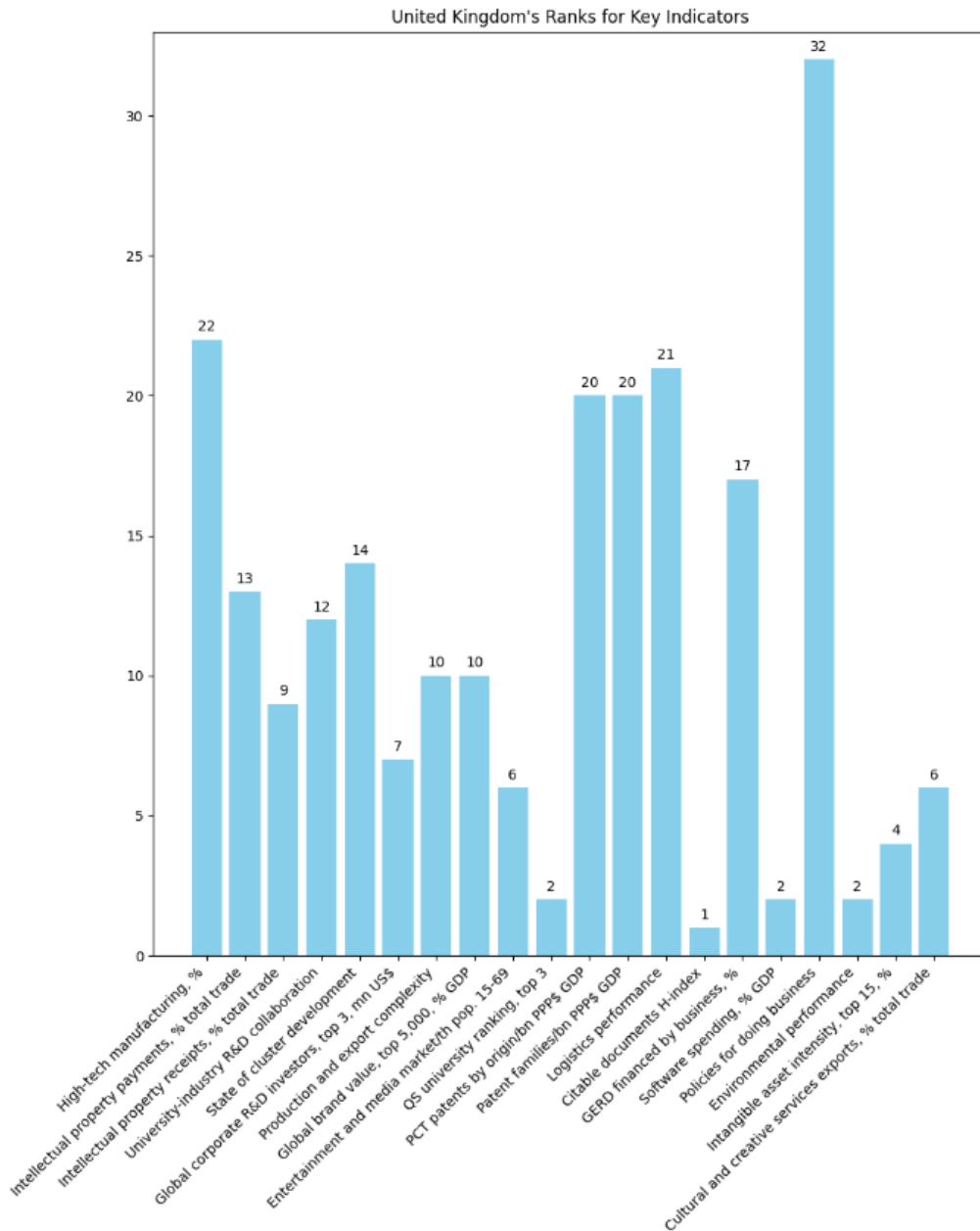
Appendix 1. Switzerland's Rank for key indicators



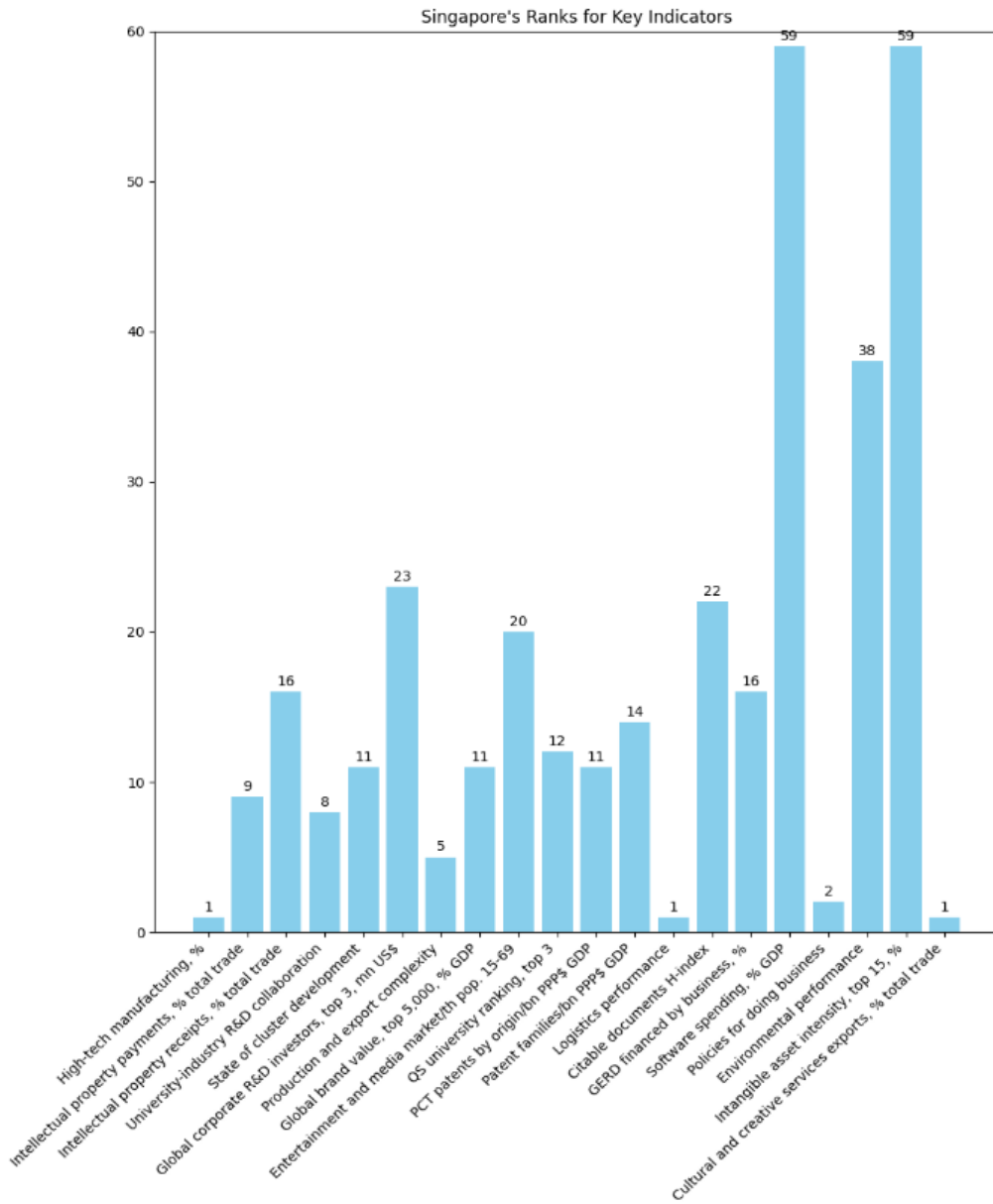
Appendix 2. Sweden's Rank for key indicators



Appendix 3. U.S.'s Rank for key indicators



Appendix 4. U.K.'s Rank for key indicators

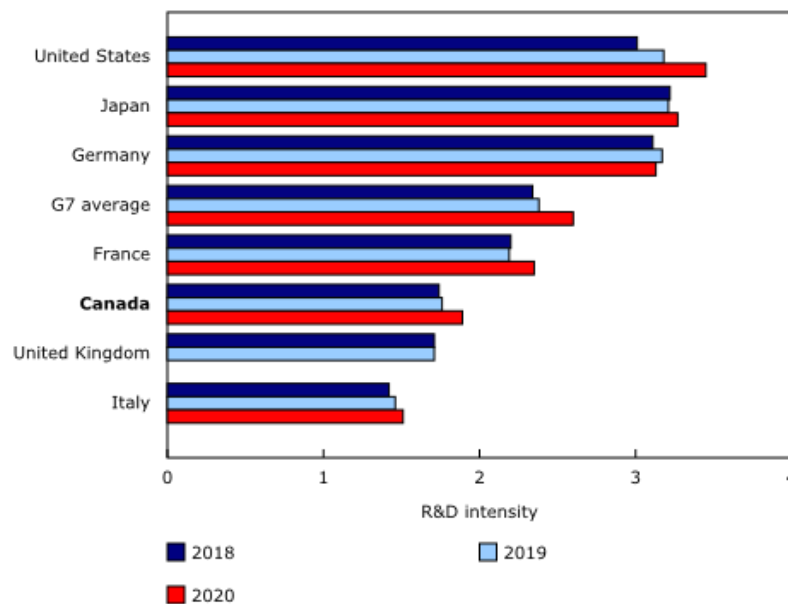


Appendix 5. Singapore's Rank for key indicators

Strengthening Research and Development (R&D) Infrastructure



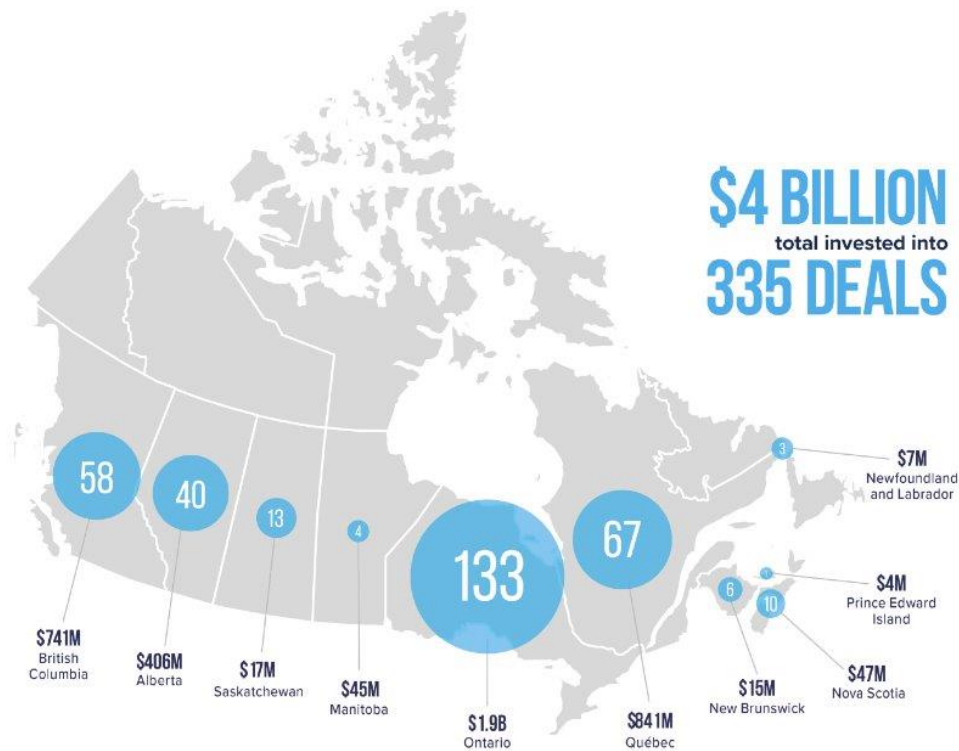
Appendix 6. Research and development expenditure (% of GDP) – Canada



Appendix 7. Gross domestic expenditures on research and development (R&D) intensity in the G7 countries

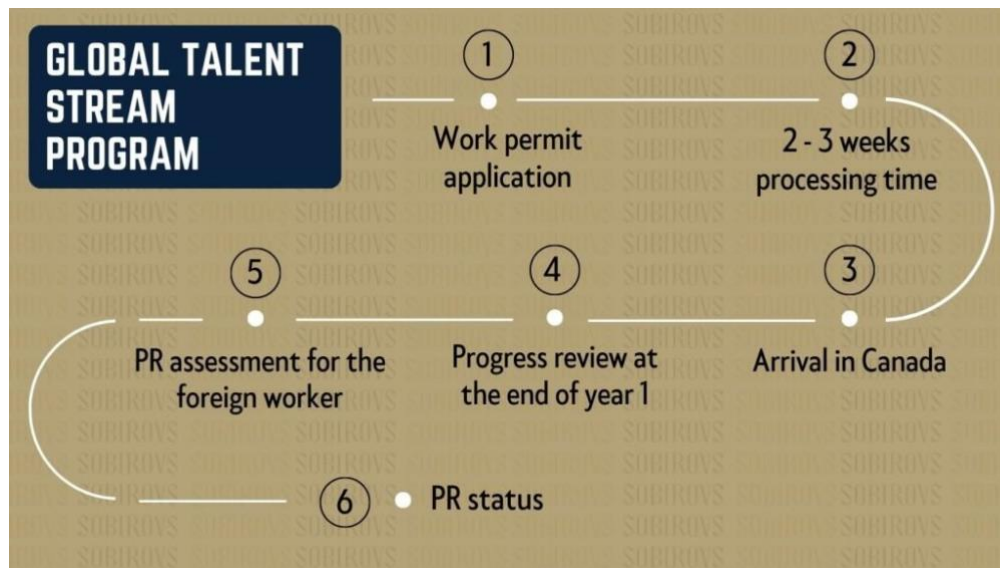
2018 to 2020

Boosting Access to Capital



Appendix 8. Canada Venture Capital Performance in 2023 H1 [9]

Enhancing Policy Making for Immigration and IP Process



Appendix 9. Process for Canada's Global Talent Stream Program [27]