

1 Institutional context

In this section, I review the details of the Alberta Investor Tax Credit (AITC) program. Further, I review the intellectual property environment in Canada, which will be directly relevant to the definition of my explained variable. Finally, I review the existing incentives for research and development (R&D) expenditures of Canadian federal and provincial governments, which are relevant to defining the applicable institutional context, specifically regarding potential threats to identification.

1.1 The Alberta Investor Tax Credit

The AITC was a three-year program initiated by the Government of Alberta in January 2017, offering a thirty percent tax credit to “investors who provide capital to Alberta small businesses doing research, development or commercialization of new technology, new products or new processes” (Alberta Economic Development and Trade, 2017, p.1)¹. The program was part of the *Investing in a Diversified Economy Act*, which also started the Capital Investment Tax Credit (CITC)². Both programs were phased out in 2019, and no additional funding was given to companies after March 2020 (Alberta Economic Development and Trade, 2019). The AITC was communicated as a solution to Alberta’s lag in “venture capital dollars” (Alberta Economic Development and Trade, 2017, p.1) relative to other large Canadian provinces, as well as a way to foster employment (Zabjeck, 2016).

The program required businesses to register with the government as Venture Capital Corporations (ECC) or Eligible Business Corporations (EBC), which would then be able to raise equity capital from investors. Only investors who had paid corporate or personal taxes in the province were eligible. While the *Investing in a Diversified Economy Act* was passed in January 2017, eligible investments in VCCs and ECCs were available to be claimed as credits retroactively from April 2016 onwards.

In order to qualify as “small”, businesses could not have more than 100 employees. Ad-

¹Tourism, interactive media, post-production and visual effects industries were also targeted by the program.

²The CITC returned the value of purchases of machinery, equipment and buildings as a tax credit. While this program may have a spillover effect on innovation through a reduced cost of innovation investment, absent the AITC, there is no reason to believe a broad capital expenditure tax credit would impact innovation products.

ditionally, they were required to pay at least 50%-75% of wages to employees working in the province³, have at least C\$25,000 in equity capital, and have at least 80% of assets in the province (Alberta Economic Development and Trade, 2019). Businesses which were engaged in research, development and commercialization of proprietary technologies were one of the main targets of the program. These companies needed to be engaged in “the process of introducing a new product or production method and making it available to the public market. This includes the commercial production of proprietary technologies that are capable of improving the processing and manufacturing of goods and services.”(Alberta Economic Development and Trade, 2019, p. 19)⁴. Mining, financial services and agricultural activities were ineligible for receiving AITC funding.

1.2 Intellectual property in Canada

The Canadian Intellectual Property Office (CIPO) is the federal agency responsible for the administration of intellectual property rights in Canada, managing patents, trademarks and industrial designs. Patents protect innovative products, compositions or machines. To apply for a patent, inventors prepare and submit an application to the CIPO.

The parties in an application can be inventors, owners⁵, agents, or other applicants⁶. Patent agents are external agents, commonly hired by the inventorship team, to assess the inventors on the application (Putnam, 2006). After sending the application, the team receives a filing date⁷, and the parties have a four-year period to request an examination date, when the CIPO will evaluate the invention to grant the patent. If granted, it will be valid for 20 years only within Canada (Abbes et al., 2022). The patent protects the invention from being

³Depending if the company was an exporter or non-exporter, respectively.

⁴The *Alberta Investor Tax Credits Regulation* specifies that “companies needed to be engaged in the research, development and commercialization of proprietary technologies produced within Alberta, including services that are directly associated with the export of the technology and are provided inside or outside of Alberta”(p.9).

⁵In most cases, inventors also hold legal ownership of the patent, however, see Alam et al. (2022) and Beaudry and Schiffauerova (2011) for relevant discussions of foreign ownership of Canadian inventions.

⁶These applicants would fall under the category of legal representatives under the *Patent Act* of Canada, which are heirs, executors, administrators of the estate, or any other actor who acts on behalf of the inventor in the patent application (Patent Act, 1985). Multiple applicants are relevant in the case of a company which hires employees to work on patent applications.

⁷According to the Canadian Intellectual Property Office (2021), incomplete applications will be returned to the parties for reapplication with a two-month grace period. Applications which are not sent back by the parties are considered abandoned.

used, made, or sold by others without the inventor's permission. When expired, a patent can be renewed through a renewal application.

Canada adheres to international treaties and agreements which govern the level of intellectual property protection in the country. These are the World Intellectual Property Organization (WIPO) treaties, the Paris Convention for the Protection of Industrial Property, and the Patent Cooperation Treaty (PCT). The WIPO treaties are of particular importance, as they allow classifying patents in a standardized way: the International Patent Classification (IPC). There are 8 patent classes, which represent broad categories of inventions; within each class, there are subclasses and groups⁸. These are: A - Human Necessities, B - Performing Operations; Transporting, C - Chemistry; Metallurgy, D - Textiles; Paper, E - Fixed Constructions, F - Mechanical Engineering; Lighting; Heating; Weapons; Blasting, G - Physics, H - Electricity (World Intellectual Property Organization, 2024). The human necessities class is particularly broad, as it includes inventions related to food, clothing, medicine, among others.

The role of international treaties also responds to the important role that intellectual property plays in the international context. For example, recent research has shown how Canadian firms underperform vs. their American counterparts due to worse intellectual property frameworks (Carew et al., 2006). Further, Canadian firms have been shown to be more likely to export to countries with stronger intellectual property protections (Rafiquzzaman, 2002). An accurate impact evaluation must consider the effects that foreign influences may have on the local intellectual property environment.

1.3 The Scientific Research and Experimental Development Credits

Canada has been characterized as one of the most generous jurisdictions for R&D credits (McKenzie, 2008) as well as a pioneer in their design (Mansfield & Switzer, 1985b). According to the Canada Revenue Agency (2023), Canadian firms could deduct 100% of current research expenditures as early as 1941⁹. In 1962, an experimental tax incentive was created after a change to the *Income Tax Act*. This program would undergo various changes over the years,

⁸A patent may be mapped to more than one IPC section.

⁹Mansfield and Switzer (1985b) contradict the Canada Revenue Agency's official account, stating that it was only since 1961 that the federal government effectively allowed companies to fully deduct capital and current research expenditure from federal taxable income.

taking the form of a full expenditure deduction plus a tax credit by 1984. The current program's name, the *Scientific Research and Experimental Development Credit*, was given in 1986. The program, with complex rules and regulations that have been amended over the years (Canada Revenue Agency, 2015).

Canada is unique in that most provinces offer additional incentives. The Provincial SR&ED tax credits are similar to the federal SR&ED tax credit, but the provinces administer them (Warda, 2000). The provincial programs started in the 1980s, and by the early 2000s, most provinces had adopted them (McKenzie, 2005; Warda, 1998). Alberta implemented the program in 2009 (Brouillete, 2013).

Given the well-documented effects of these policies on R&D expenditures (Agrawal et al., 2020; Becker, 2015; Mansfield & Switzer, 1985a), it is sensible to believe that policy efforts like these have an ongoing impact on innovation. It is crucial to consider time trends to control for federal SR&ED changes. Further, since the provincial programs are frequently reformed (McKenzie, 2005), provincial SR&ED tax credits pose threats to causal identification. The fact that Alberta imposed an SR&ED tax credit in 2009 could pose a threat to the identification of the AITC's effect on innovation in a quasi-experimental setting, which makes the use of event study regressions critical to validate results from a difference-in-differences approach.