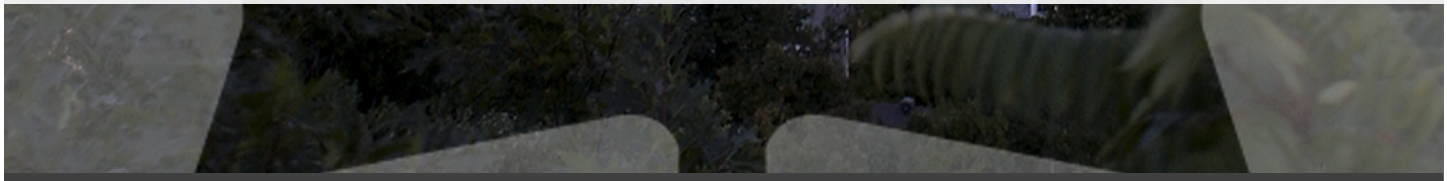
Innovation, Science and Economic Development Canada
Canadian Intellectual Property Office

Innovation, Sciences et Développement économique Canada
Office de la propriété intellectuelle du Canada

# 2017

# IP CANADA REPORT



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# MESSAGE FROM THE CEO

I am pleased to present the second Intellectual Property Canada Report.

In order to provide a clearer picture of what innovation looks like in Canada, this report examines the use of the intellectual property (IP) system in Canada by Canadian and international filers, as well as the use of the global IP system by Canadians. This year's report also contains a preview of CIPO's patent analysis of space technologies. While the Canadarm is one of Canada's most recognized contributions to space exploration, we expect our final report on space technologies to reveal many other exciting areas of innovation by the highly qualified Canadian engineers, scientists and technicians who work in this field.

Overall, this year's IP Canada Report illustrates that Canadians are still taking advantage of the expanding global marketplace. What's more, indications point to Canada continuing to expand its global IP activity: Canadians filed abroad versus domestically at a 4.6 to 1 ratio in 2015, a substantial increase from 3 to 1 in 2006. This growth makes Canada's impending membership of international IP agreements such as the Patent Law Treaty, the Madrid Agreement for trademarks and the Hague Agreement for industrial designs all the more important. Joining these agreements is one of the major tenets of CIPO's long-term strategic planning: that economic prosperity in the 21st century is driven by new ideas and knowledge-based industries that operate globally.

Ensuring that Canadian businesses and innovators have the support they need to grow both at home and abroad are also core goals of the Government of Canada's Innovation and Skills Plan and CIPO's new Five-Year Business Strategy for 2017–2022. With each successive IP Canada report, we will continue to shed light on Canada's innovation environment and on the areas where IP usage can help Canadians succeed.

Johanne Bélisle
Chief Executive Officer

# ABOUT US

The Canadian Intellectual Property Office (CIPO), a Special Operating Agency of Innovation, Science and Economic Development Canada (ISED), is responsible for the administration and processing of intellectual property in Canada. CIPO contributes to Canada's innovation and economic success by: providing greater certainty in the marketplace through high-quality and timely IP rights; fostering and supporting invention and creativity through knowledge sharing; raising awareness to encourage innovators to better exploit IP; helping businesses compete globally through international cooperation and the promotion of Canada's IP interests; and administering Canada's IP system and office efficiently and effectively.[i]

# EXECUTIVE SUMMARY

The IP Canada Report 2017 is the second in a series of annual reports that present important trends in intellectual property use by Canadians, both domestically and abroad. The Canadian Intellectual Property Office (CIPO) collects domestic data and the World Intellectual Property Office (WIPO) provides international data. WIPO collects its international data from member countries.

An important trend shows that IP applications filed outside of Canada are becoming a much larger proportion of total applications by Canadians. Canadians filed IP outside of Canada versus domestically at a 4.6 to 1 ratio in 2015, a substantial increase from 3 to 1 in 2006. The foreign to domestic ratio for industrial design applications was 1.7 to 1 in 2015, an increase from 1.3 to 1 in 2006. Though Canadians file for trademarks abroad less often than domestically (0.7 to 1 in 2015), applications abroad make up a larger proportion than they did in 2006 (0.55 to 1). This shows the importance of harmonization mechanisms such as the Madrid and Hague Agreements, which Canada is preparing to join. An increase in Canadian trademark filing outside of North America is linked to increased market diversification by Canadian businesses.

In 2016, CIPO received applications for 34,745 patents, 54,665 trademarks and 6,170 industrial designs. Patent filings dropped by 6% in 2016, while trademarks and industrial designs grew by 4% and 6% respectively. CIPO granted 26,424 patents in 2016, and registered 43,306 trademarks and 5,703 industrial designs. Both patent grants and trademark registrations grew substantially in 2016, by 19% and 9% respectively. Industrial design registrations remained stable in 2016.

The majority of growth in filings to CIPO has come from increases in the volume of non-resident applications. Historically, residents have filed a relatively low share of total patent applications in Canada (12% in 2016) compared to other countries. This is due to Canada being a small open economy with close economic ties to the much larger U.S. economy. CIPO continues to see most of its patent applications coming through the Patent Cooperation Treaty (PCT), a treaty that allows one application to cover multiple countries simultaneously. In 2016, PCT applications accounted for 78% of all applications to CIPO, an increase from 73% in 2007. Annual patent filings to CIPO remain at 17% below their 2006 levels. CIPO has undertaken research to better understand this decrease in activity by modelling annual patent filings based on related economic variables.

Canadian applications for IP rights abroad have grown in the last ten years. In 2015, the most recent year of international data available, Canadians made 37,387 applications for IP rights abroad: 19,857 patents, 16,159 trademarks and 1,371 industrial designs. Total IP applications grew by 3% between 2014 and 2015, and the long-term trend showed growth of 33% over the last ten years. Specifically, Canada saw a 21% increase in patent filings, a 44% increase in trademarks filings and a 61% increase in industrial designs during this period.

Two key markets for Canadians are the United States and China. The United States continues to be the largest destination of Canadian IP filed outside of Canada. Over half of all Canadian IP applications abroad are filed in the United States. Canada also receives more applications from the U.S. than any other country. The U.S. filed 47% of total patent applications at CIPO, 30% of total trademark applications and 52% of total industrial designs. Canadians file the majority of their patents directly with the U.S., given that it is typically the primary export market of Canadian businesses. However, the U.S. files to Canada mostly via the PCT, suggesting its applications have more of an international orientation. Over the last ten years, Canadians have increased the proportion of their U.S. applications using the PCT, which may show a desire to broaden international markets. Canadian applications to China have increased significantly over the last decade as well. From 2006 to 2015, Canadian applications grew by 36% for patents, 126% for trademarks and 100% for industrial designs.

# INTRODUCTION

The 2017 IP Canada Report describes changes and trends in the use of intellectual property (IP) by Canadians both domestically and abroad. It contains a summary of the most recently available data on three major types of IP: patents, trademarks, and industrial designs (ID). The IP data in this report comes from the Canadian Intellectual Property Office (CIPO) and the World Intellectual Property Organization (WIPO). The most recent data available from WIPO is from 2015, while the most recent data available for CIPO is from 2016. The first section of this report examines patent, trademark and industrial design activity in Canada. The second section examines IP activity abroad by Canadians. The third section highlights recent research at CIPO on the economic impact of ID. The last section examines Canadian patenting in one particular sector, space-related technologies.

Canada's economic growth and the success of our businesses depend on strong IP rights. IP, in all its forms, is necessary for protecting Canadian brands, products and markets. Patents are vital tools used to protect and incentivize innovation. Trademarks enable brand owners to distinguish their goods and services from those of their competitors in an increasingly competitive global market. Industrial designs (ID) are increasingly important in a design-conscious economy. In particular, recent work by CIPO suggests that ID has a positive economic impact on firm performance.

Canadians engage in IP activity both domestically and around the world. Since Canada is a small open economy, our IP profile is highly international in nature. Canadians apply for patents either directly to a country's office, or using the Patent Cooperation Treaty (PCT). The PCT is a multinational filing system that allows a single application to cover any of the countries that are members of the agreement. Canadians currently file trademark and industrial design applications abroad directly to foreign offices; however, Canada is in the process of implementing international treaties for these forms of IP. The Madrid Protocol for trademarks will allow Canadians to file a single application covering multiple countries and for foreign applicants to designate Canada. The Hague Agreement for Industrial Designs allows foreign applicants to designate Canada in their applications.

IP filings abroad are by far the most significant aspect of IP activity by Canadians, growing 33% from 2006 to 2015, compared with 6% domestically. The faster growth in filings abroad reflects the importance of Canada's international trade. The top foreign destinations for Canadian IP applications continue to be the United States, the European Union and China. This report further highlights the close links between Canada and the United States. Canada filed 16,191 patent applications in the U.S. in 2016, a 10% decrease since 2015. Canadians are increasingly moving away from direct filings towards applications in multiple countries using the PCT.

Patent applications to CIPO fell by 6% in 2016. This was mainly due to a decrease in non-resident applications, but CIPO also saw a reduction in resident applications. Over the last decade, patent applications at CIPO have declined 17%. Recent research by CIPO demonstrates that while growth in patent applications to CIPO has trailed GDP growth since the early 2000s, it has grown more than the share of GDP related to manufacturing or R&D spending. Patent grants have increased significantly in the last year and since 2007, due to CIPO's improved efficiency.

Domestic trademark filings saw a 4% increase in 2016. Canadians' use of IP domestically and abroad rebounded from both the 2008–2009 recession and the 2014–2015 economic slowdown due to lower oil prices. With economic growth projected at 2.8% in 2017[ii], we predict additional growth in the use of IP. Looking forward, Canada's accession to the Madrid and Hague Treaties leads CIPO to expect a possible increase in applications from around the world, both for trademarks and industrial designs. Harmonization with international IP agreements will facilitate greater international trade and help Canadian businesses expand into new markets.

### Economic Research at CIPO: IP Analytics Reports

This report also highlights ongoing research done by CIPO's Economic Research and Strategic Analysis Group. Our IP analytics team, in partnership with the Canadian Space Agency, has highlighted Canada's areas of relative advantage in space-related technologies. In 2017, CIPO published the Patent Landscape Report for Shale Oil and Gas, and will publish a report on Climate Change Mitigation Technologies, as highlighted in the IP Canada 2016 Report.

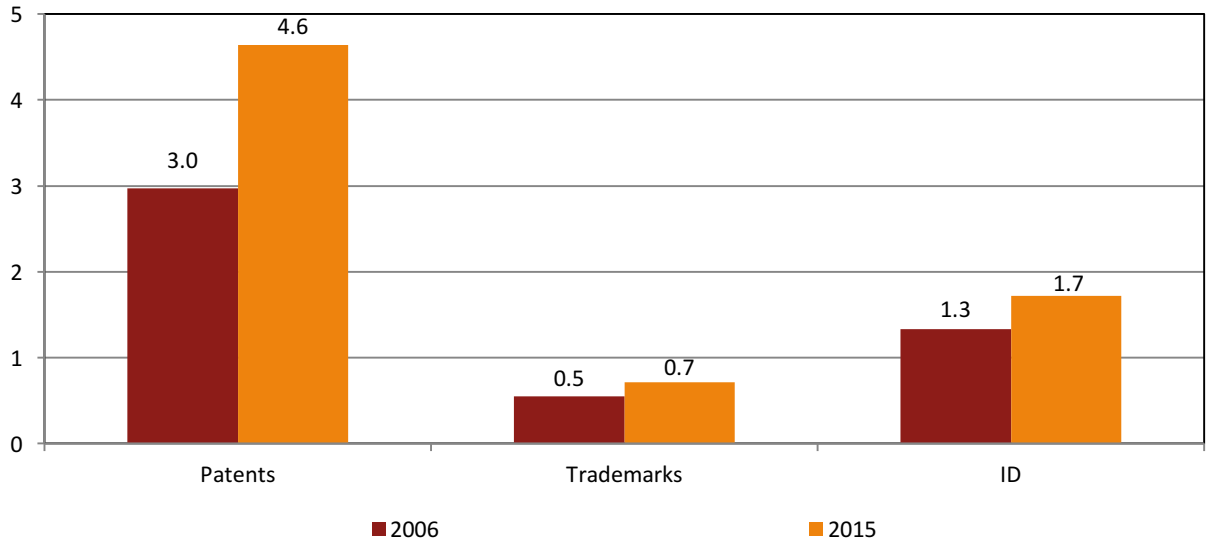
# INTELLECTUAL PROPERTY IN CANADA

This section describes trends in IP data from CIPO. Three types of formal IP rights are examined: patents, trademarks and ID. They are examined with respect to total number of applications, grants (patents) and registrations (trademarks and industrial designs). The volumes of applications for these types of IP reflect various aspects of innovative and economic activity, while the volumes of grants and registrations depend on CIPO's own productivity.

Several other forms of IP are not examined in this report. CIPO also administers another well-known type of IP, copyright. Since copyrights do not have to be registered to be legally effective, CIPO's data does not provide a complete overview of this type of IP in Canada. CIPO also uses a separate process to protect integrated circuit topographies; these are three-dimensional configurations of electronic circuits embodied in integrated circuit products or layout designs. Plant breeders' rights are managed by the Canadian Food Inspection Agency. Specific definitions of patents, trademarks and industrial designs, as well as information about cost and duration, are included in the appendices.

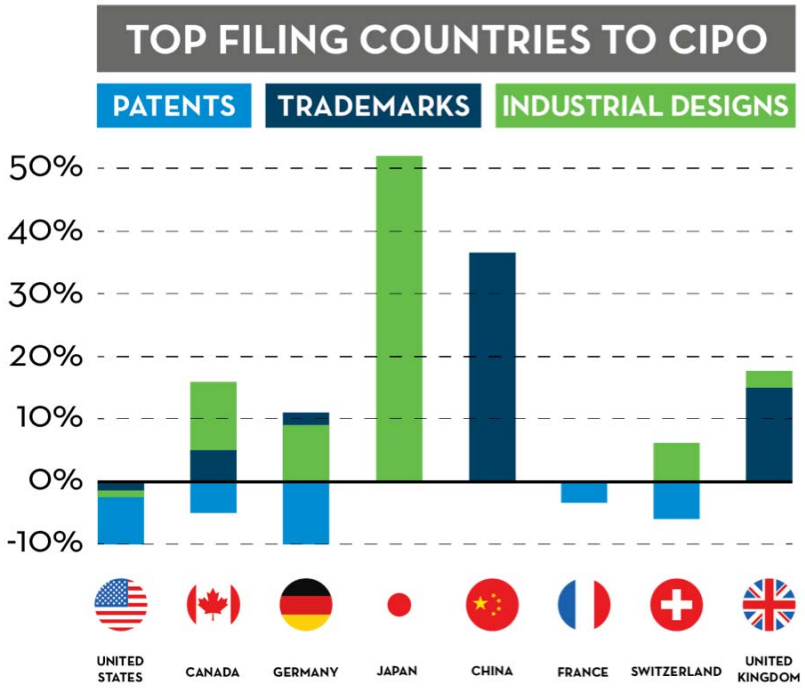
An important long-term trend in the IP data shows that applications abroad are making up an increasing share of total applications by Canadians. Figure 1 shows the ratio of foreign to domestic applications by Canadians for patents, trademarks and industrial designs. Canadians file more abroad for both patents and industrial designs. For all three forms of IP, the ratio of foreign to domestic applications increased markedly from 2006 to 2015. Canadians filed 4.6 times more patent applications abroad than domestically in 2015, an increase from 3 times as many in 2006. In 2015, Canadians filed for trademarks abroad 70% as often as they did domestically, an increase from 55% in 2006. Industrial design applications abroad went from 1.3 times the number of domestic applications in 2006, to 1.7 times as many in 2015.

**Figure 1 – Ratio of foreign to domestic applications by Canadians for 2006 and 2015**



Figures 2, 3 and 4 show the top six countries filing in Canada for each type of IP right, along with the percent change in annual application volume. The U.S. remains the largest international filer in Canada for all categories of IP rights. CIPO receives more applications from the U.S. than from Canada for both patents and ID, but receives more trademark applications from Canadians than any other country. Germany was in third place for both patents and trademarks, while Japan was third for ID. While patent activity saw mild reductions or stagnation from the top five international applicants, trademarks and ID saw moderate increases from most top applicants.

**Figures 2, 3 and 4 – Percentage change in intellectual property applications between 2015 and 2016 for top filing countries to CIPO**



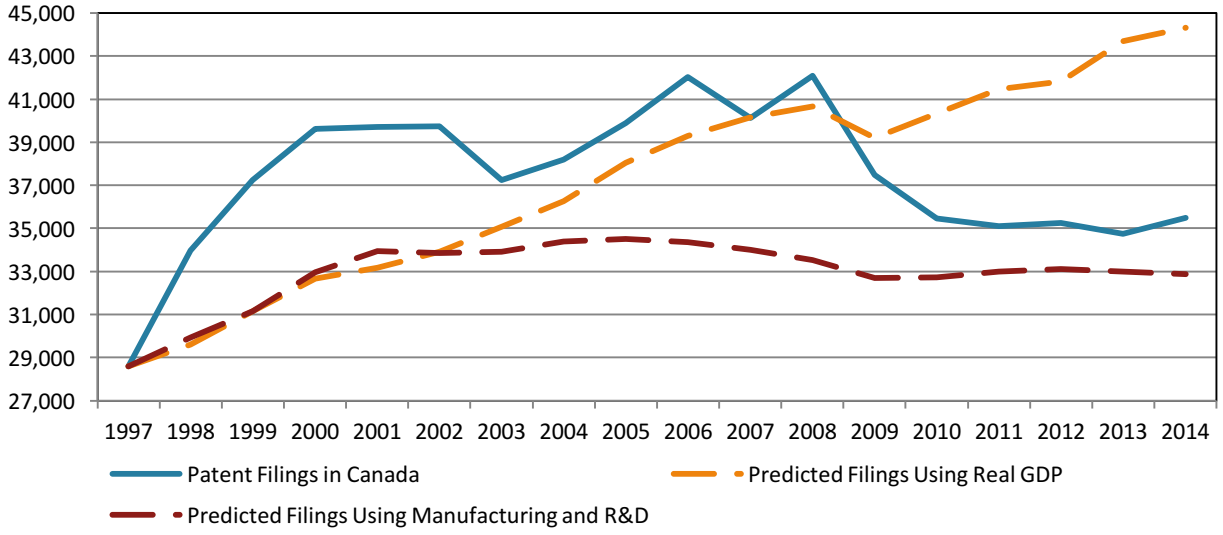
## PATENTS

Patents provide a time-limited, legally protected, exclusive right to make, use and sell an invention. In 2016, the total number of patent applications to CIPO dropped by 6% to 34,745. Of these, 4,078 were by Canadian residents and 30,667 were by non-residents. Direct applications to CIPO comprised 22% of the total, with the other 78% coming through the PCT. CIPO granted 26,424 patents in 2016, an increase of 19% from 2015. Of total grants, 3,295 were to Canadian residents and 23,129 were to non-residents. Patent applications to CIPO have declined by 17% since 2006.

### *Understanding trends in patent growth*

Canada's growth in gross domestic product (GDP) does not fully explain the trend in domestic patent applications. In Figure 5 below, we see actual patent filings in Canada from 1997 to 2014, plotted with two models that predict patent filings based on different inputs. The actual trend in patent filings fell below the pace set by Canadian real GDP since the early 2000s. However, when compared with patent filings in Canada, a second model that incorporates manufacturing activity and spending on research and development shows a correlation in these trends. Canada has seen a decline in research and development (R&D) expenditure as a share of GDP and in manufacturing output as a share of GDP since the early to mid-2000s.[iii] We see a correlation between R&D spending and patent applications in the literature.[ivv] We also see that the Canadian private sector invests less in R&D than similar countries.[vi] Research currently underway by CIPO suggests that the share of GDP from manufacturing has a positive impact on the number of domestic patent applications in advanced economies. This work takes into account spending on R&D, which means that the impact of manufacturing share is not simply the spillover effect of additional R&D from the manufacturing sector, but a separate impact of manufacturing capacity.

**Figure 5 – Predicting trends in patent filings in Canada**




This may be related to the firm's strategic decision about whether or not to patent. Firms may be considering the likelihood of being able to manufacture at the scale needed to produce the product under consideration for patenting. Canada is also unusual because a large fraction (88%) of domestic patent applications originate from other countries. It is speculated that foreign firms may file fewer patents in Canada because they are less concerned about domestic competition from Canadian firms that lack larger-scale manufacturing capacity.

Some researchers also suggest that manufacturing capacity is required for firms to profit from their innovations, particularly in advanced economies like Canada and the United States.[vii] As seen in Figure 5, Canada's domestic patent application numbers may be reflective of an underlying trend related to manufacturing capacity, and may not be the result of local variations in patent rules or conditions.

### *Patent applications*

In 2016, resident patent applications to CIPO dropped by 5% to 4,078, while non-resident applications dropped by 6% to 30,667.[viii] The resident share of patent applications to CIPO continues to be stable around 12%.[ix] Canada's share of resident applications is much lower than the global average (68% in 2015)[x] due to our small open economy and close economic ties to a large neighbour, the U.S. As a result, we receive a large number of patent applications from the U.S. and the rest of the world. This is consistent with similar countries like Australia, which typically has a resident application share of about 10%.[xi] The U.S. remained the largest filer in 2016 with 16,191 applications, while other top foreign filers were Germany (2,023), Japan (1,864), France (1,695) and Switzerland (1,249). The top five non-resident filers represented 75% of the non-resident applications to Canada and 66% of the total.[xii] Figure 6 shows changes in total patent applications to CIPO from 2006 to 2016, as well as total resident and total non-resident applications.

**Figure 6 – Patents filed in Canada by residency status, 2006–2016**

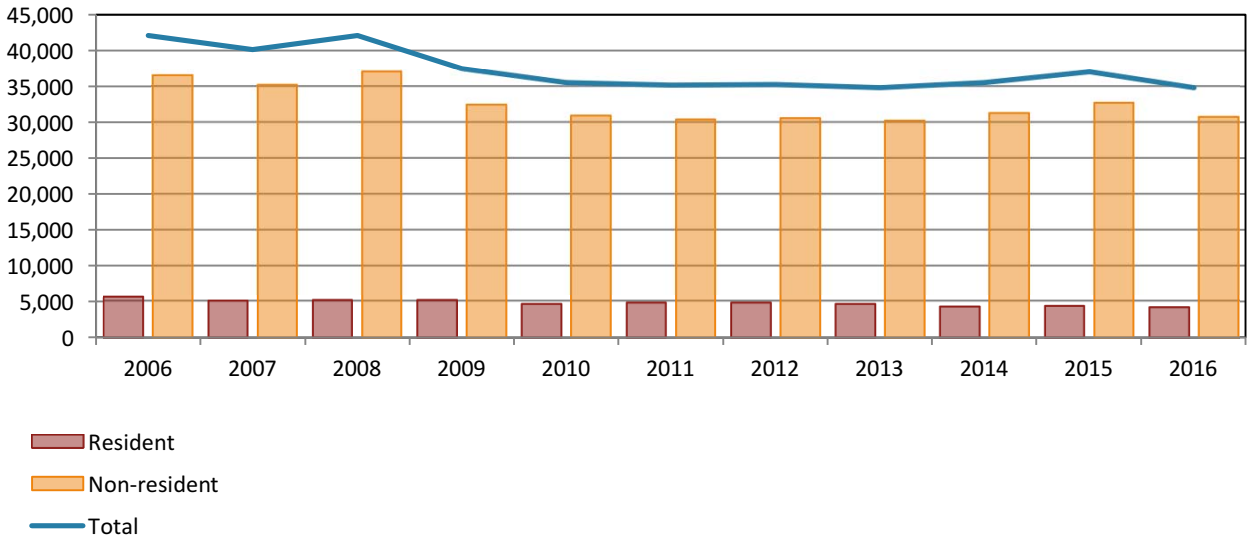
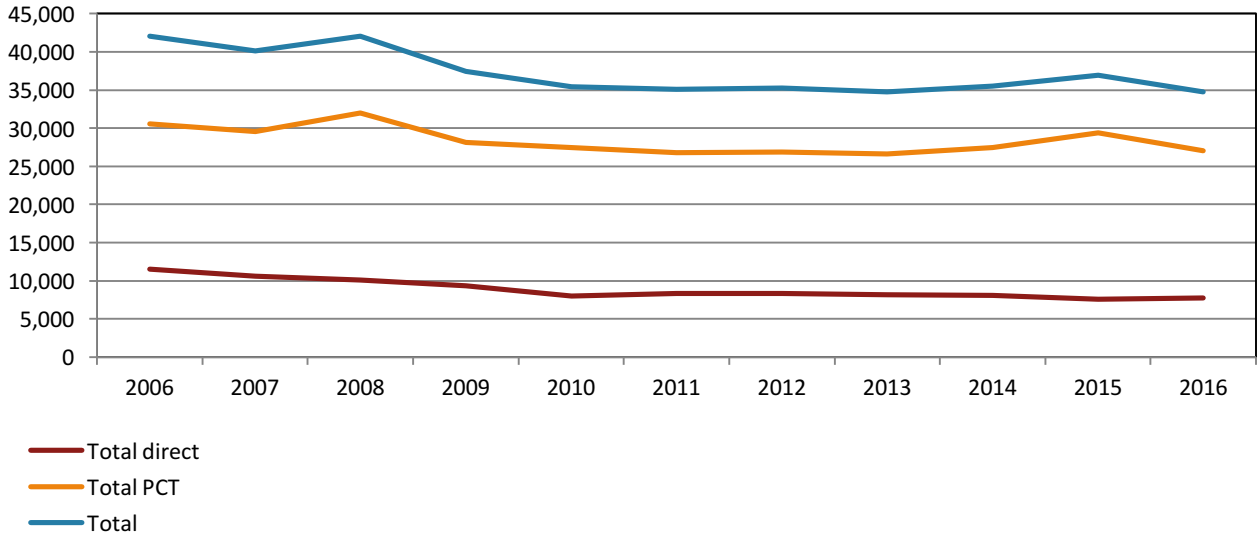



Figure 7 compares patents filed directly to CIPO to those via the Patent Cooperation Treaty (PCT) system. The PCT is an international agreement that allows filers to make a single application to any number of the signatory countries.[xiii] The streamlined PCT process is more convenient and cost-effective for those seeking protection in multiple countries.[xiv] In 2016, applicants to CIPO filed for 27,021 patents using the PCT, compared with 7,724 directly.[xv]

**Figure 7 – Patents filed in Canada by filing mechanism, 2006–2016**

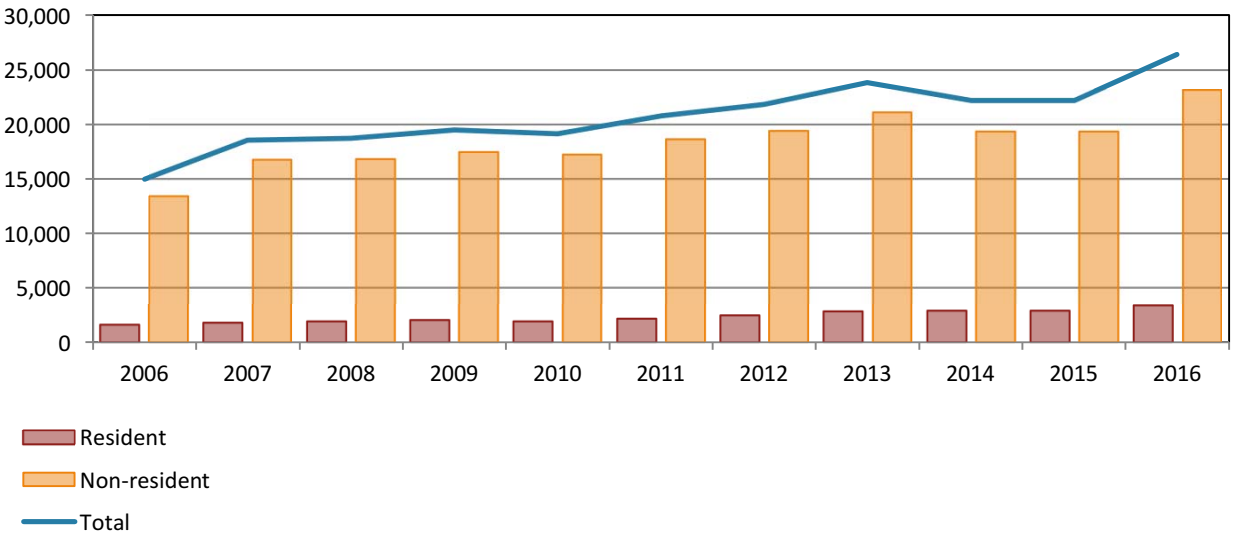


The long-term trend shows that an increasing proportion of patent applications to CIPO use the PCT. The proportion of total applications using the PCT is up about 5% since 2006. However, the proportion of applications coming through the PCT dropped by almost 2% in 2016, while direct applications rose modestly.[xvi]

### *Granted patent applications*

The annual number of patents granted is not an indicator of innovative activity, but rather CIPO's productivity and efficiency. Figure 8 shows that in 2016, CIPO granted 26,424 patent applications, an increase of 19% from 2015 and 42% since 2007. Around 12% of these grants went to residents, a share that has fluctuated between 10% and 13% since 2006.[xvii] Applications granted to residents grew by 15% in 2016 (3,295) and grew 20% for non-residents (23,129). Grants to residents have grown by 82% since 2007, over double the growth rate for non-residents (38%). The average turnaround time for the patent grant process was 38.8 months in 2015–2016.[xviii]

**Figure 8 – Patents granted in Canada by residency status, 2006–2016**




### *Conclusion*

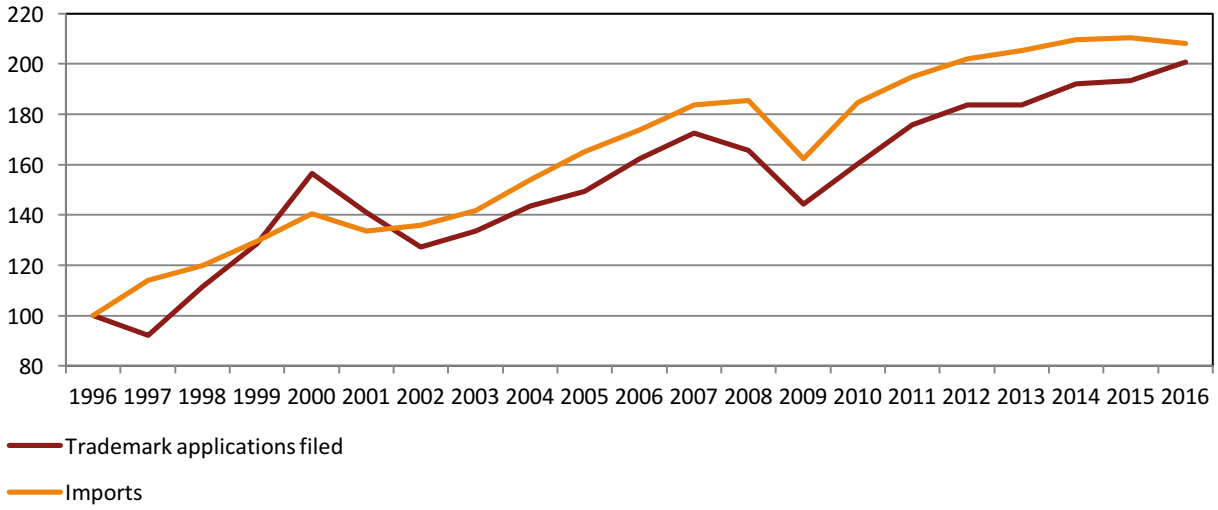
Patenting is an important indicator of innovation and a key factor in the knowledge economy. Patent applications in Canada declined moderately after the 2008–2009 recession and have remained stable since then. Patent grants continue to rise as a result of CIPO's commitment to reducing unprocessed inventory. While CIPO saw a slight decrease in the proportion of applications using the PCT, the long-term growth (5% since 2007) reflects Canada's close integration with the global economy. This integration and the fact that Canada is a small and open economy explain the lower resident share of total patent activity (12% in 2016), which is in line with similar economies.[xix]

## TRADEMARKS

A trademark is a combination of letters, words, sounds or designs that distinguishes one company's goods or services from those of others in the marketplace. In 2016, CIPO received 54,665 trademark applications, of which 23,652 were from Canadian residents (43% share) and 31,013 from non-residents. CIPO registered 34,306 trademarks in 2016, of which 14,864 were from Canadian residents (43% share) and 19,442 from non-residents.

Trademark applications relate to a variety of economic variables. Historically, total trademark applications and GDP have been pro-cyclical, meaning that they typically move in the same direction and with similar fluctuations. For instance, during the global recession of 2008–2009, trademark applications to CIPO dropped markedly (by 14% or 6,802 applications). Non-resident filings relate more closely to imports, since they are strongly associated with foreign firms wanting to sell their products in Canada. While non-resident applications and imports typically display co-movement, Figure 9 illustrates that there can be discrepancies between the two. For instance, trademark applications grew much faster than imports leading up to the year 2000. Further research identifying the more trademark-intensive industries could provide more insight into these trends.

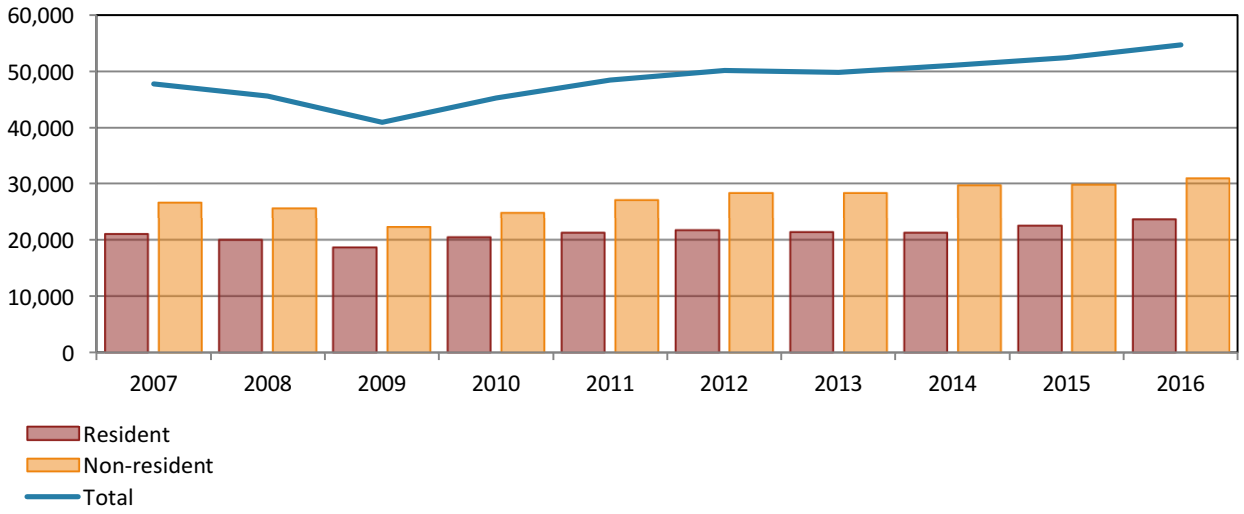
**Figure 9 – Trademark non-resident applications and imports, indexed to 100 in 1996, Canada[xx]**



### *Trademark applications*

In 2016, Canadian residents filed 43% of total trademark applications to CIPO, a rate that has been fairly stable since 2007. Figure 10 shows total trademark applications filed in Canada, along with resident and non-resident totals from 2007 to 2016. Resident applications grew 5% in 2016 to 23,652, while non-resident applications grew by 4% to 31,013. Top non-resident filers were the United States, Germany, the United Kingdom, China and France, which accounted for 73% of non-resident applications and 42% of total applications.

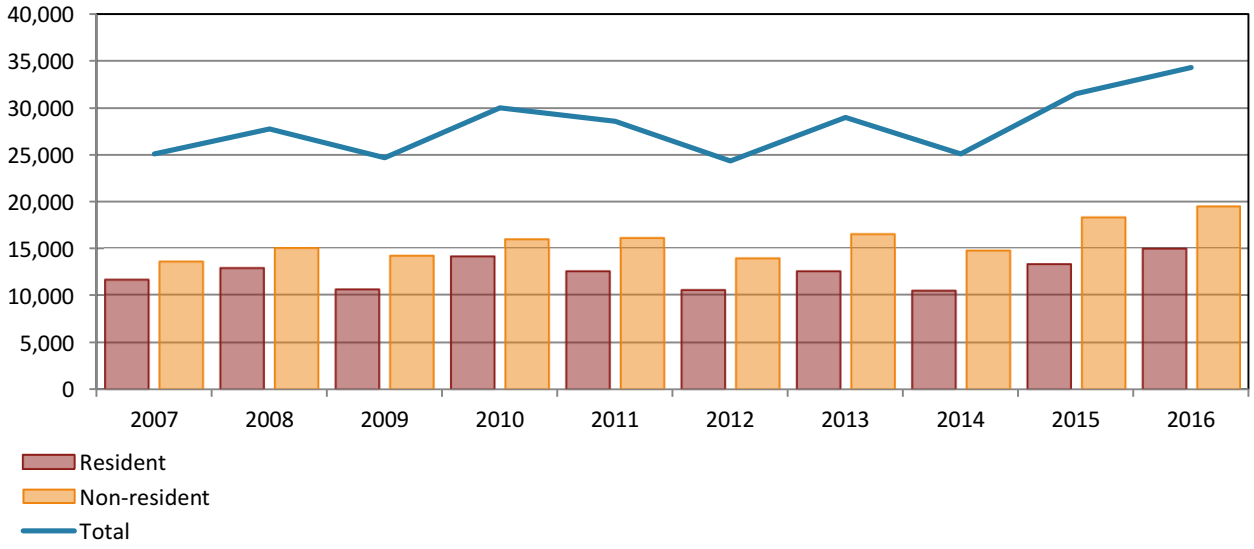
**Figure 10 – Trademarks filed in Canada by residency status, 2007–2016**




### *Trademark registrations*

Trademark registrations fluctuate significantly year to year as shown in Figure 11. In 2016, CIPO registered 34,306 trademarks, a 9% increase from 2015. The time for processing trademarks at CIPO is about two years[xxi], meaning that trends in registrations lag trends in applications. However, in the past decade, registrations have grown much faster than applications as a result of CIPO's commitment to reducing unprocessed inventory. The average turnaround time was 27.4 months in 2015–2016.[xxii]

**Figure 11 – Trademarks registered in Canada by residency status, 2007–2016**



### *Conclusion*

Trademarks are vital tools for businesses operating in Canada to distinguish themselves from their competition. Canada's resident filings have grown by 12% since 2007, while non-resident filings have grown by 16% during this time. The increase in the volume of registrations (37% since 2007) reflects both the increased application volume and the effectiveness of CIPO's trademark examiners. Non-resident filings and imports correlate because foreign firms have a strong desire to protect their brands while selling their products in Canada. A small majority of Canada's trademark applications come from abroad, with 57% of the total in 2016.

## INDUSTRIAL DESIGNS

Industrial designs (ID) are comprised of the visual features of a finished article, namely: shape, configuration, pattern or ornament, or any combination of these features. Individuals and businesses can protect these aspects of their designs in Canada by registering their industrial designs with CIPO. This form of IP protects aspects of a finished work that other forms of IP may not. They are important tools for firms to protect product reputation and visual brand recognition, and to facilitate design creativity. Like other IP rights, ID applications are associated with economic variables. The desire for ID protection reflects an expectation of the profitability of that product. Figure 12 shows the co-movement between non-resident ID applications and imports.

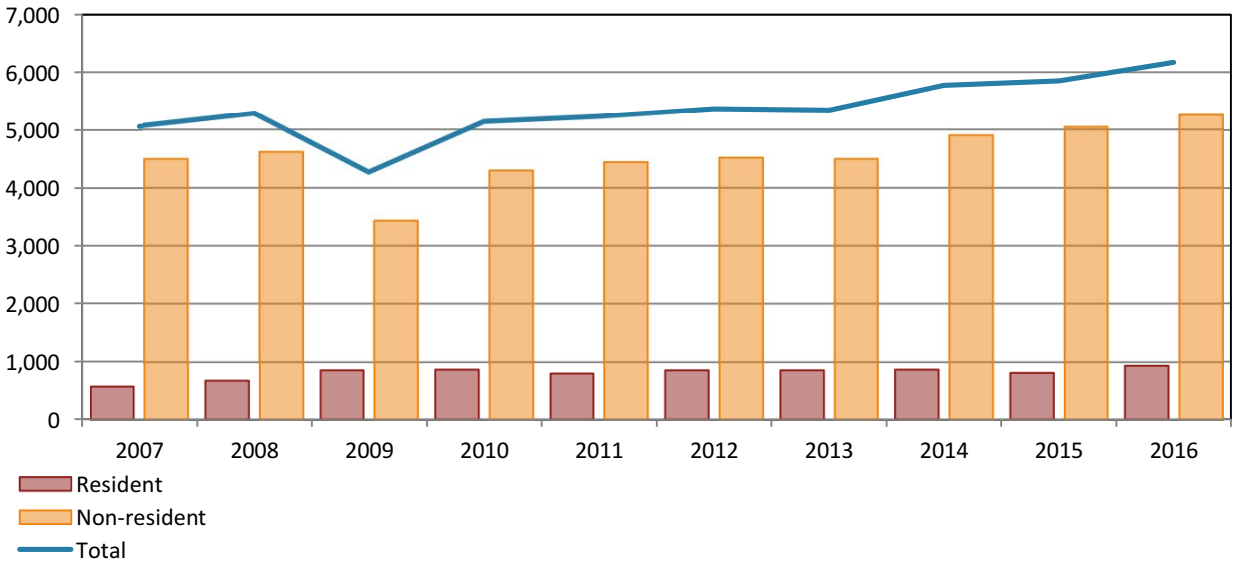
**Figure 12 – Non-resident ID applications and imports to Canada, indexed to 100 in 1996, Canada**[xxiii]


CIPO received 6,170 industrial design applications in 2016. Canadian residents applied for 916 (15%), and 5,254 applications were made by non-residents. CIPO registered 5,703 industrial designs in 2016, of which 801 were from Canadian residents (14%) and 4,902 from non-residents.

### *Industrial design applications*

In 2016, ID applications grew 6% and have grown by 22% since 2007. The majority of applications originated in the United States (52%). Figure 13 shows ID applications to Canada by residency status from 2007 to 2016. Resident applications for ID have grown almost four times as fast as non-resident applications since 2007, up 61% versus 17% respectively. Resident filings now make up 15% of total filings, up from 11% in 2007.

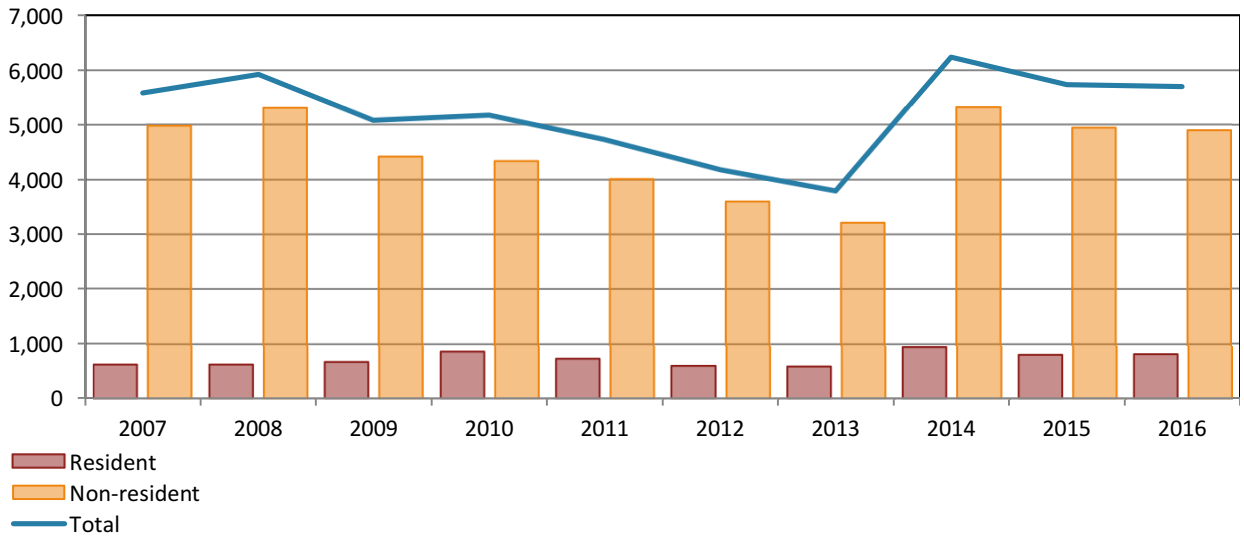
**Figure 13 – Industrial designs filed in Canada, 2007–2016**




### *Industrial design registrations*

The short processing times for registering ID make the data more variable, as seen in Figure 14. While CIPO's ID registrations dropped between 2008 and 2013, they increased dramatically in 2014 due to large decreases in unprocessed applications. Registrations declined slightly in 2015, but the totals for both 2014 and 2015 roughly match the highs of a decade ago. ID registrations remained stable in 2016. Processing time from filing to registration was 10.5 months in 2015–2016.[xxiv]

**Figure 14 – Industrial designs registered in Canada, 2006–2016**



*Conclusion*

ID applications at CIPO have increased substantially in recent years, indicating the importance of industrial designs in the IP landscape. Application volume grew 6% in 2016 and has grown 22% since 2007. We have seen significant growth in resident ID applications since 2007 (61%), and 17% growth for non-resident applications in that time. Registrations were stable from 2015 to 2016. Growth in registrations was observed for resident applicants, up 2% in 2016 and 32% since 2007.

**Economic Research at CIPO: Forecasting ID**

In the coming years, Canada will implement the Hague Agreement and CIPO will likely see an increase in applications. CIPO plans on researching forecasting methods to best predict future changes in the volume of ID applications we receive.

# GLOBAL IP ACTIVITY BY CANADIANS

This section describes trends in global IP activity by Canadians. CIPO is able to get a broad overview of Canada's global IP activity by using data obtained from WIPO. WIPO collects data from member countries and combines the international data into a large online database. For this reason, 2015 is the most recent year available for WIPO's data. This data provides information on different aspects of IP applications such as the applicant's country of origin and the application method. Information regarding applicant country of origin allows CIPO to see where Canadians are filing for IP rights around the world. Applications are also being broken down into two filing methods: direct filings to a country's IP office or filings through the appropriate international treaty filing system. Direct applications indicate a focus on particular markets, while multinational applications imply a desire to broaden markets. In Canada's case, the only multinational treaty currently used is the Patent Cooperation Treaty (PCT), but in the coming years Canadians will also be able to file for trademarks and industrial designs in a similar fashion using the Madrid Protocol and the Hague System, respectively.

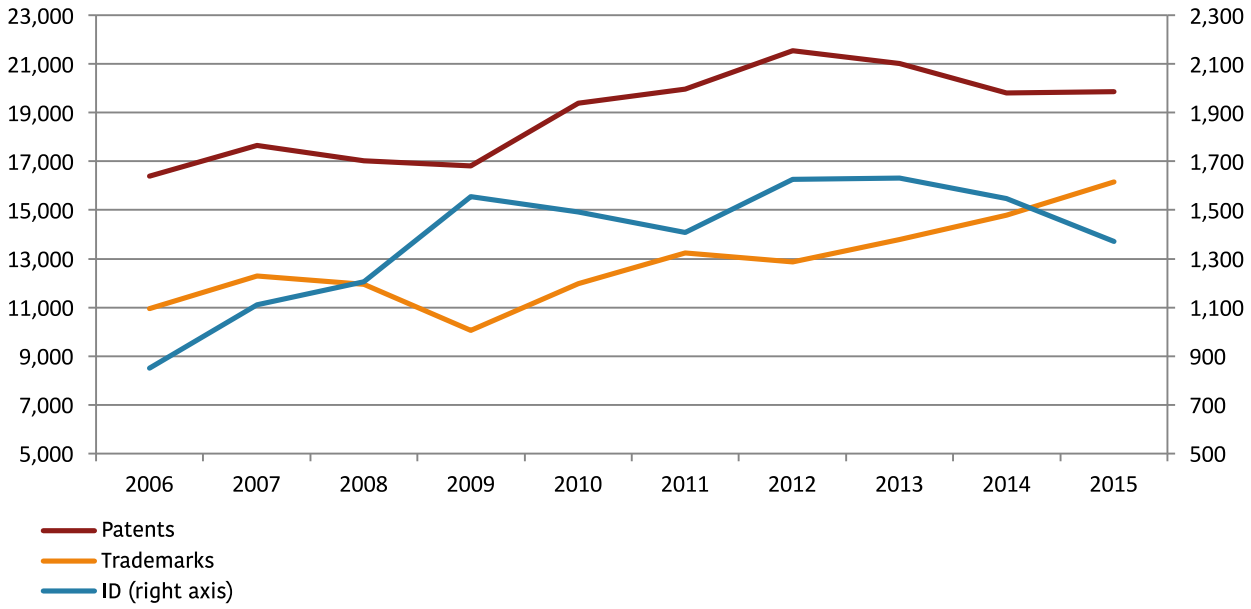
Obtaining IP rights in other jurisdictions is important for Canadian firms competing in the global marketplace. These rights allow Canadians to protect their inventions, brands and designs in international markets. Canadian IP filings outside of Canada grew much faster than our domestic filings over the last ten years, with 33% versus 6% since 2006. Canadians file the majority of their patent and industrial design applications abroad (82% and 63% respectively), while filing most of their trademark applications domestically (62%).

Long-term growth in Canada's IP applications abroad has been steady over the last ten years. Patent applications to other countries have grown by 21% since 2006, while trademarks and industrial designs have grown 25% and 61% respectively. Virtually no growth was seen in patent filings abroad in 2015; trademark filings were up 8% and ID filings decreased by 11%. Larger fluctuations in ID data are typical due to the relatively low volume of applications.

Trademark filings abroad show two important long-term trends. Applications to China have grown significantly faster than other major destinations, up 23% in 2015 and 126% from 2006 to 2015. This highlights the growing importance of the Chinese market to Canadian businesses. In addition, Canadians are filing a larger share of applications outside North America. Applications within North America grew 15% over the last ten years, while applications going outside North America grew by 82%.

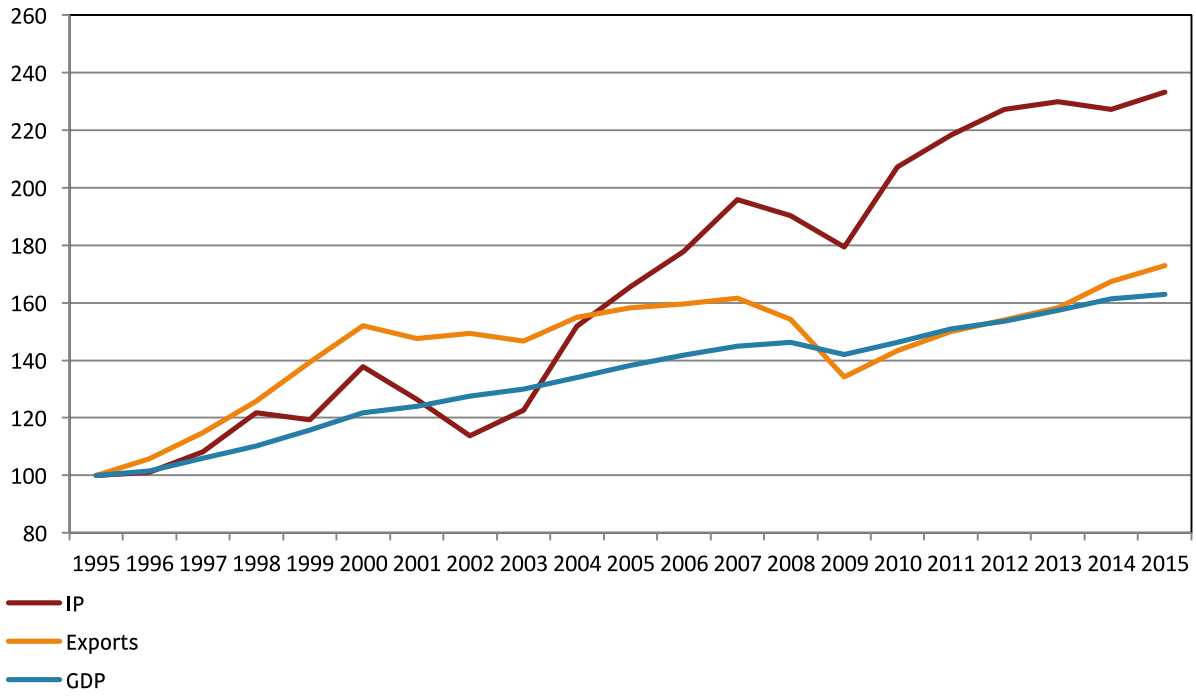
Figure 15 shows trends in filings by Canadian abroad for patents, trademarks and ID. In 2015, patents made up 53% of total applications outside of Canada by Canadians, while trademarks made up 43% and industrial designs 4%. Total applications grew 3% in 2015 and have grown 32% since 2006.

**Figure 15 – IP applications abroad by Canadians, 2006–2015**




Global applications for IP rights by Canadians have outpaced GDP growth and exports since 1995 as shown in Figure 16. Note that global includes both domestic and foreign applications. Global applications grew more than twice as fast as real GDP (133% versus 63%) and outpaced exports (73%) as well during this period.

**Figure 16 – Canadian IP applications globally and GDP, indexed to 100, 1995–2015**

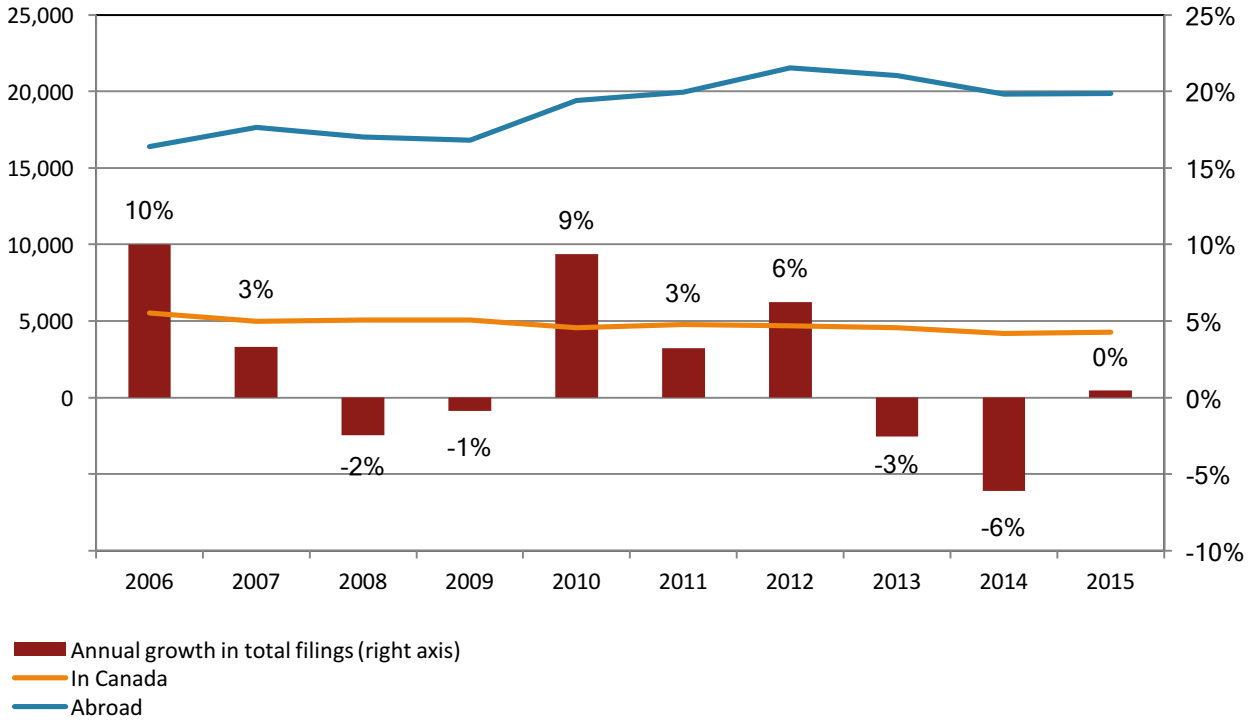


## PATENTS

Canadians filed for patents abroad about 4.6 times as often as they did domestically in 2015, an increase from three times as often in 2006. Figure 17 compares both domestic and patent applications abroad by Canadians. In 2015, Canadians filed for 19,857 patents abroad and 4,277 patents domestically. Note that the same invention may be counted more than once as Canadians will seek protection in the relevant markets for each of their patented inventions. While resident filings did grow 2% in 2015, they have fallen 23% since 2006. Filings abroad remained stable in 2015 and grew 21% over the last ten years.

Since 2006, domestic applications have been stable, while filings abroad appeared more sensitive to economic conditions. Applications decreased during the 2008–2009 global financial crises and with the fall in oil prices in 2014. Interestingly, decreases in total applications were larger in 2013–2014 (1,562) compared to 2008–2009 (755). This may be because the Canadian economy is more sensitive to the price of oil and relatively insulated from the global financial crisis due to our internationally recognized strong banking system. Total filings were stable in 2015, but are still 8% below 2012 levels.

**Figure 17 – Patents filed in Canada and abroad by Canadians, 2006–2015**



Patents can be filed directly to national IP offices or through the Patent Cooperation Treaty (PCT), a fling system that facilitates applications to multiple countries simultaneously. For Canadians filing to the United States, direct filings are still more common than filings through the PCT. This makes sense given that the U.S. is often the primary market of many Canadian businesses. Filings to the U.S. using the PCT reflect the desire of Canadian businesses to expand their markets beyond our primary trading partner. Figure 18 shows that from 2006 to 2015, Americans filed a much higher proportion of their applications to Canada using the PCT than Canadians did in the United States. However, Canada has seen a sustained increase in the share of its U.S. bound applications using the PCT, from 7% in 2006 to 20% in 2015. While Canada still files 80% of its U.S. applications directly, the ratio of Canadian to American PCT share has improved from 1 to 11 in 2006 to about 1 to 4 in 2015.

**Figure 18 – Patents filed between Canada and the U.S. via the PCT, 2006–2015**

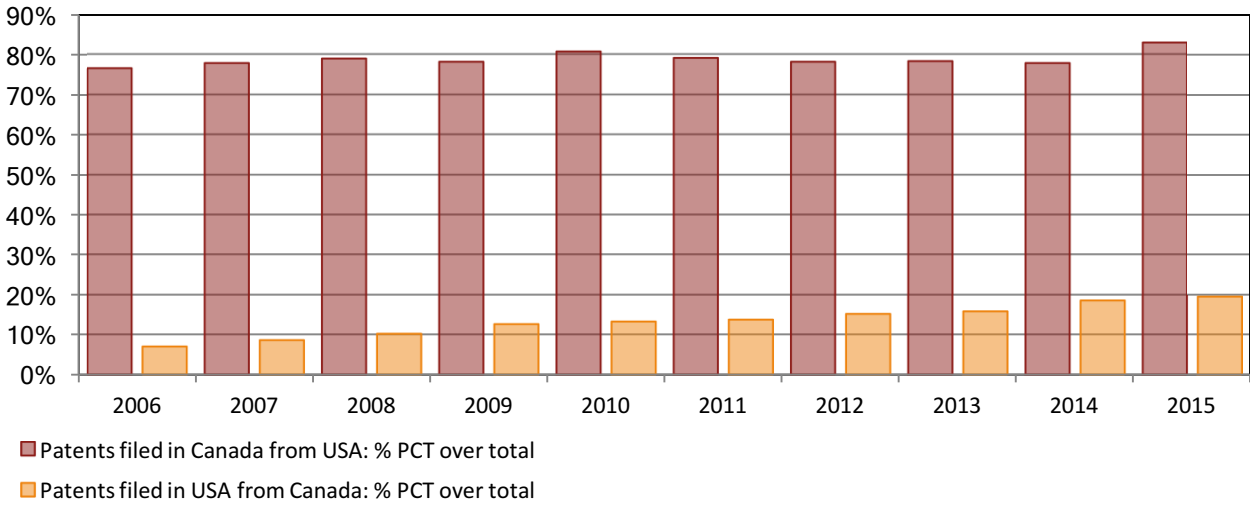
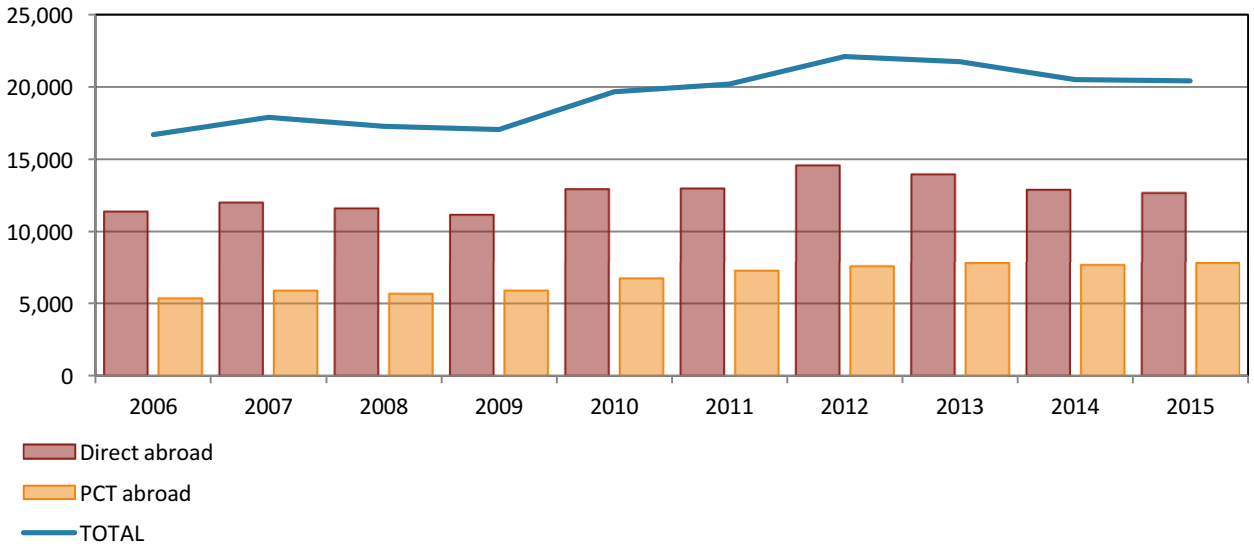


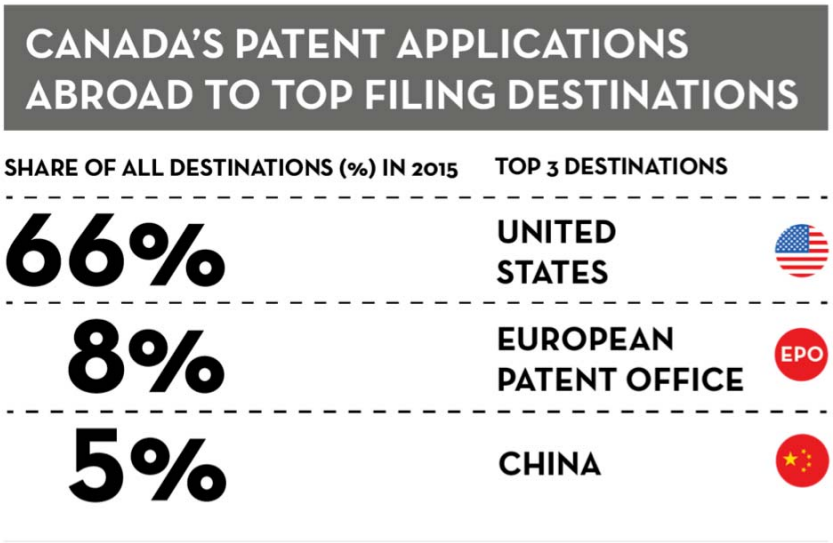

Figure 19 shows that Canadians filed 37% of their applications abroad using the PCT in 2015, while the remaining 63% were filed directly to national offices; these shares are virtually unchanged since 2014. Since 2006, PCT applications have grown by 46% while direct applications have grown by 10%. This shows that Canadians are increasingly favouring the PCT for applications abroad.

**Figure 19 – Canadian patent applications abroad by filing method, 2006–2015**



The top three filing destinations provide a window into Canadian patenting activity. In 2015, Canada's top three filing destinations remained the U.S., the European Patent Office (EPO) and China respectively. They received 80% of Canadian applications abroad between them. Figure 20 shows the respective shares for these three offices. The total for the top three destinations was 15,866 applications, a 28% increase since 2006. The United States received the largest share of Canadian patent applications abroad at 66%; this is a 38% increase since 2006. Filings to China have increased by 36% since 2006.

**Figure 20 – Share of Canada's patent applications abroad to top filing destinations**




### *Conclusion*

While Canadian patent filings abroad increased only marginally in 2015, it has been the driver of growth in global filings by Canadians since 2006. The United States is the main destination for applicants, receiving 13,201 applications in 2015. This is more than triple the number of Canadian applications domestically. Growth in patent applications abroad has been rapid, with a 21% increase between 2006 and 2015. Most of that was driven by PCT applications, which now make up more than 37% of Canadian applications abroad. This shows that Canadians are filing more in multiple jurisdictions, further diversifying our international trade.

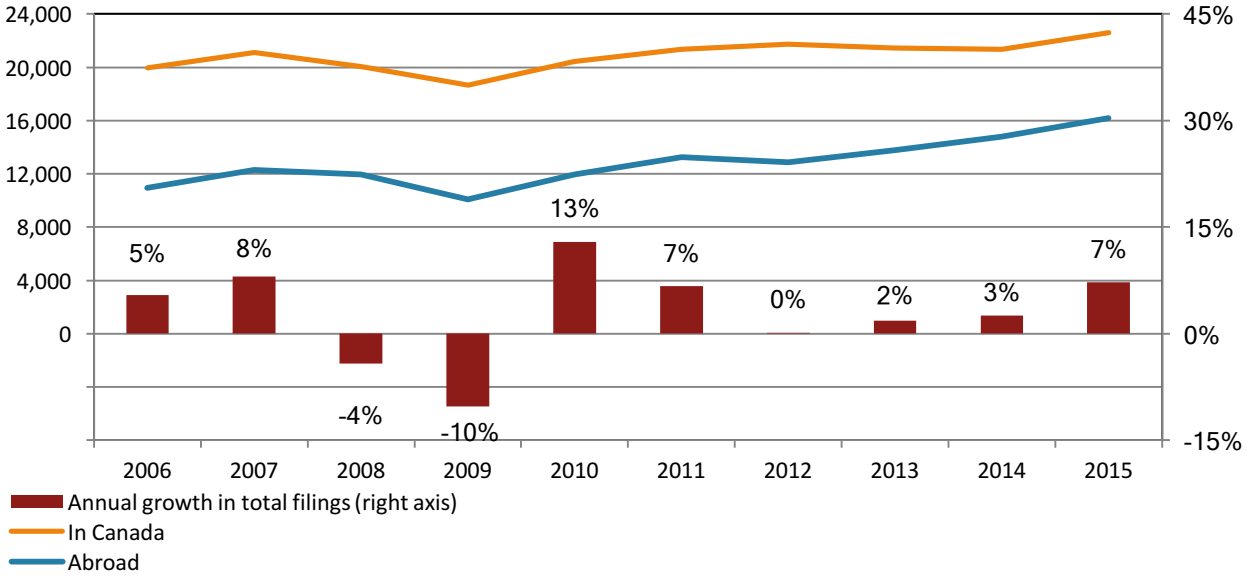
**Economic Research at CIPO: Collaboration with the OECD**

CIPO and the Organisation for Economic Co-operation and Development (OECD) are partners in an ongoing project to understand the key factors in Canadian business decisions regarding which markets they select to file patents in.

## TRADEMARKS

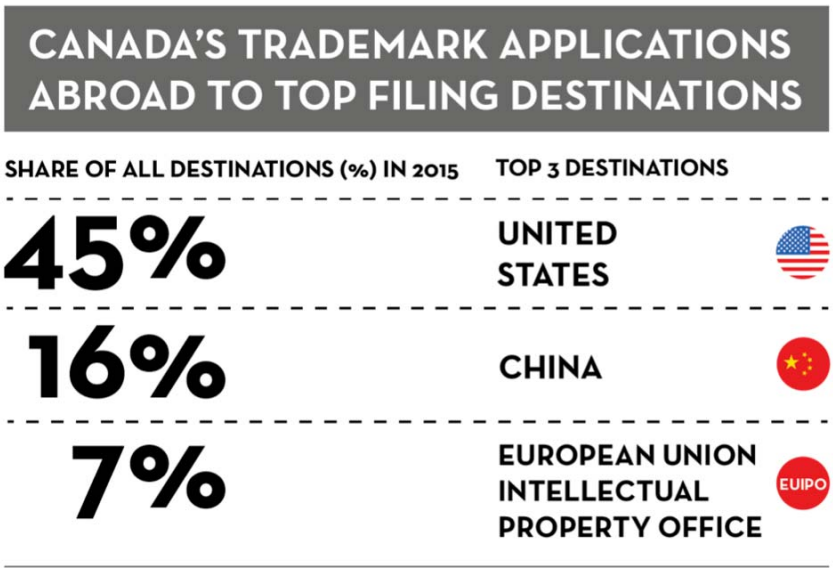
Between 2006 and 2015, trademark applications abroad by Canadians increased 48%, from 10,951 to 16,159. Demand for trademarks continues to increase as international brand reputation becomes more important for Canadian businesses. Figure 21 shows trademark filings by Canadians both domestically and abroad, and their annual growth rates from 2006 to 2015. Filings dropped during the global financial crisis of 2008–2009, but rebounded in 2010 and have continued to rise since then.

**Figure 21 – Trademark applications filed abroad by Canadians, 2006–2015**




In 2015, the top three filing destinations were respectively the U.S., China and the European Union Intellectual Property Office (EUIPO). Figure 21 shows the shares of total trademark filings for each of these three countries. Canadians filed for 7,310 trademarks in the U.S., 2,508 in China and 1,207 at the EUIPO. From 2006 to 2015, applications to the U.S., China and the EUIPO were up 20%, 126% and 42% respectively. While the U.S. accounted for 50% of filings in 2014, its share decreased to 45% in 2015. Since annual filings to the U.S. were up 7% in 2015, it is apparent that the total share of Canadian applications going towards other countries grew much faster. We see faster growth in applications to countries outside North America, highlighting the decision of Canadian businesses to expand their international markets.

**Figure 22 – Share of Canadian trademark applications abroad to top filing destinations**

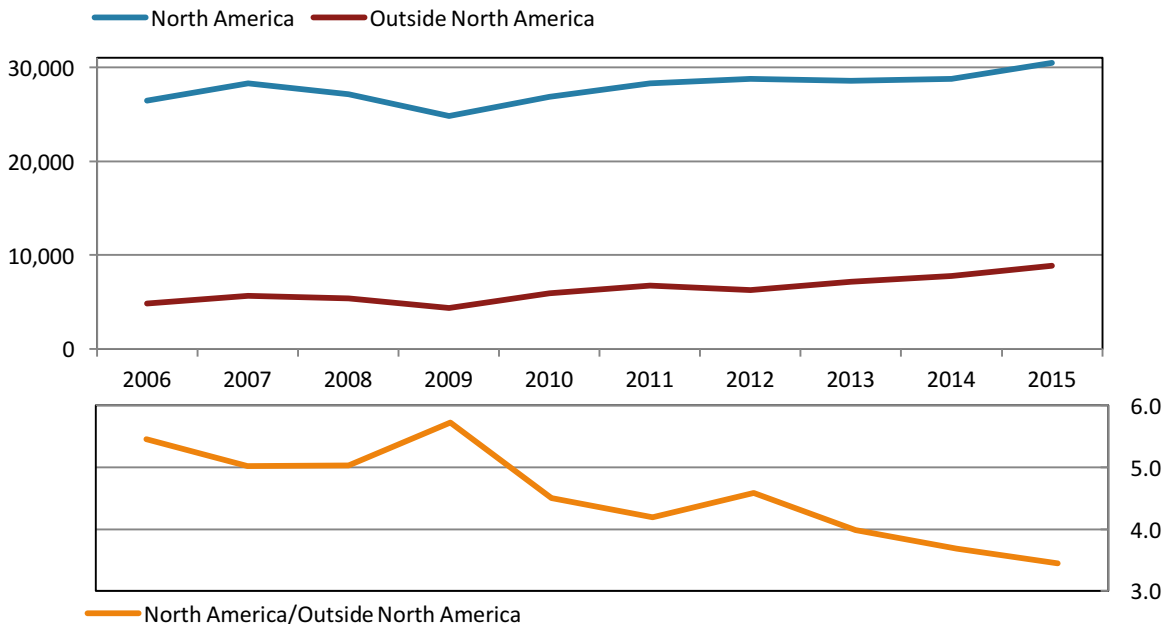



*Diversification in filings*

An important long-term trend in Canadian trademark activity shows applicants are rapidly diversifying their filings by going outside North America. In the top graph of Figure 23, we see that while applications within North American increased 15%

from 2006 to 2015 (26,497 to 30,477), applications going outside North America increased by 82% (4,857 to 8,849). The bottom graph shows the ratio of total filings by Canadians within North America (Canada, the U.S. and Mexico) compared with Canadian filings outside North America. This ratio decreased from 5.4 to 1 in 2006 to 3.4 to 1 in 2015, illustrating the faster growth in applications going outside North America.

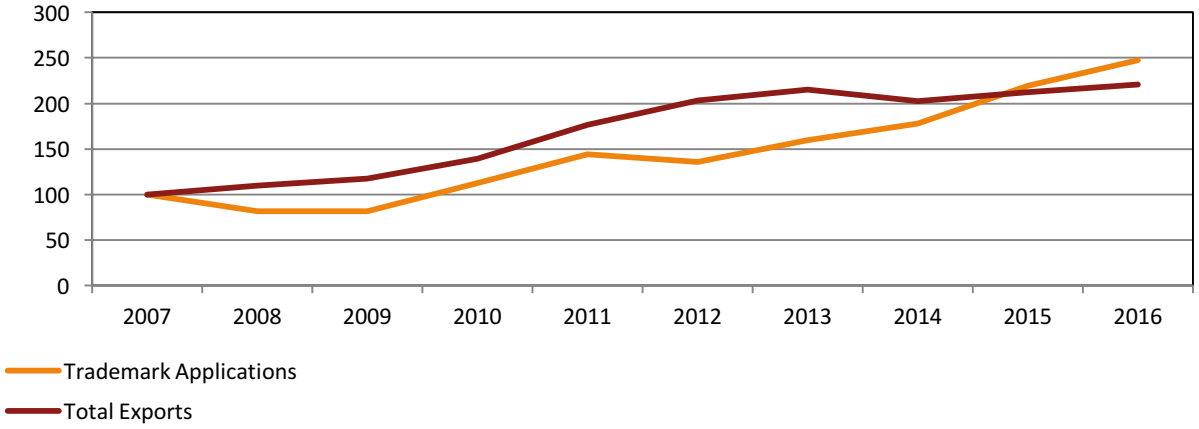
**Figure 23 – Canadian trademark filings within and outside North America from 2006–2015; Top – total filings, Bottom – ratio of filings in North America to filings outside North America**




*Spotlight: Canadian trademarks in China*

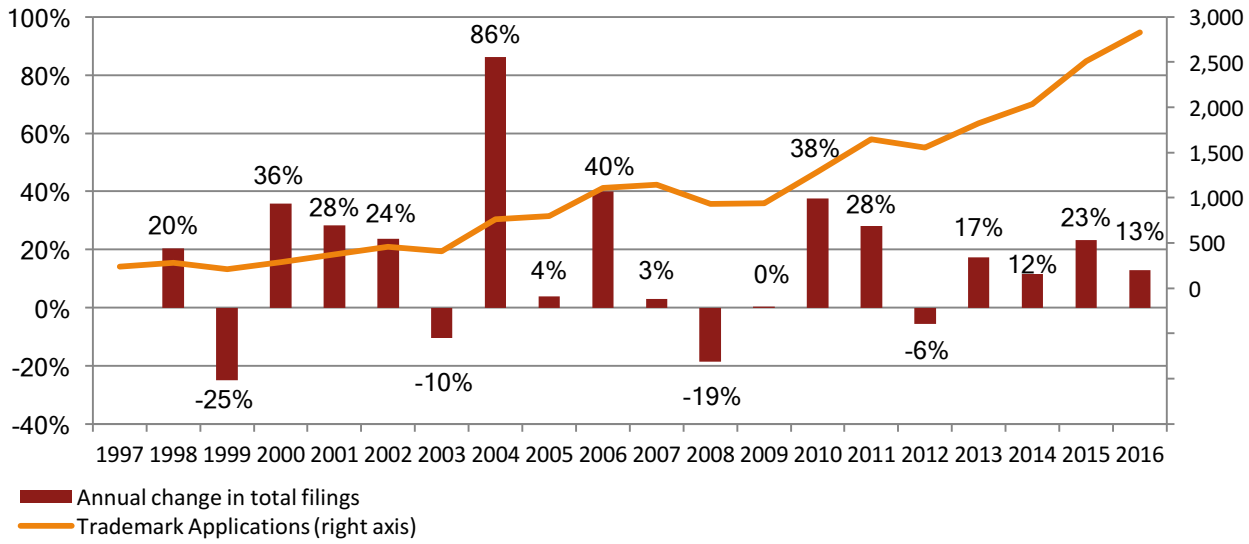
The importance of the Canada-China trade relationship cannot be understated; Canada trades more with China than any other country besides the United States.[xxv] Canada exported over $22 billion worth of goods and services to China in 2016. China has led the OECD in GDP growth[xxvi], averaging 9% growth between 2007 and 2016. China surpassed the U.S. in 2015 in total GDP, making it the largest national economy in the world.[xxvii] China's position as the world's largest and fastest-growing economy is a clear motivation for Canadian businesses to expand to this market. The increasing importance of Chinese markets to Canadian businesses is apparent in the trademark data. Figure 24 compares Canadian filings to China and total exports from 2007 to 2016, indexed to 100 in 2007. We see that they grew approximately the same amount during this period, up 120% for non-resource exports and 147% for trademark filings.

**Figure 24 – Trademark filings to China and non-resource exports, indexed to 100, 2007–2016**




China has seen the largest growth for any major destination of Canadian trademark applications in recent years. Canadian trademark applications in China grew 13% in 2016. Figure 25 shows total filings and the annual growth from 1997 to 2016. We see that Canadian applications to China have increased most years since 1997, growing at an annual average rate of 14%.

**Figure 25 – Canadian trademark applications to China and annual change, 1997–2016**




*Conclusion*

Trademark applications remain an important part of Canada's international IP activity. The U.S. continues to account for the largest share of trademark applications made by Canadians abroad. CIPO will be acceding to the Madrid Protocol, an agreement that will provide Canadians with a simplified process for trademark applications. Canadians will be able to file a single application at CIPO for multiple destinations instead of multiple direct filings to separate offices. Similar to the Patent Cooperation Treaty, the Madrid Protocol may stimulate movement away from direct applications to the United States, as illustrated in the domestic patents section of this report. This would support Canadian businesses wishing to diversify beyond our primary markets, a trend already seen in exports and trademark data. CIPO's new trademark forecasting methods will help to predict the likely increase in applications abroad.

## INDUSTRIAL DESIGNS

The increasing importance of industrial designs in the global marketplace can be seen in Figure 26, which shows an increase of 66% in global ID applications from 2006 to 2015.[xxviii]

**Figure 26 – Industrial designs filed globally, 2006–2015**

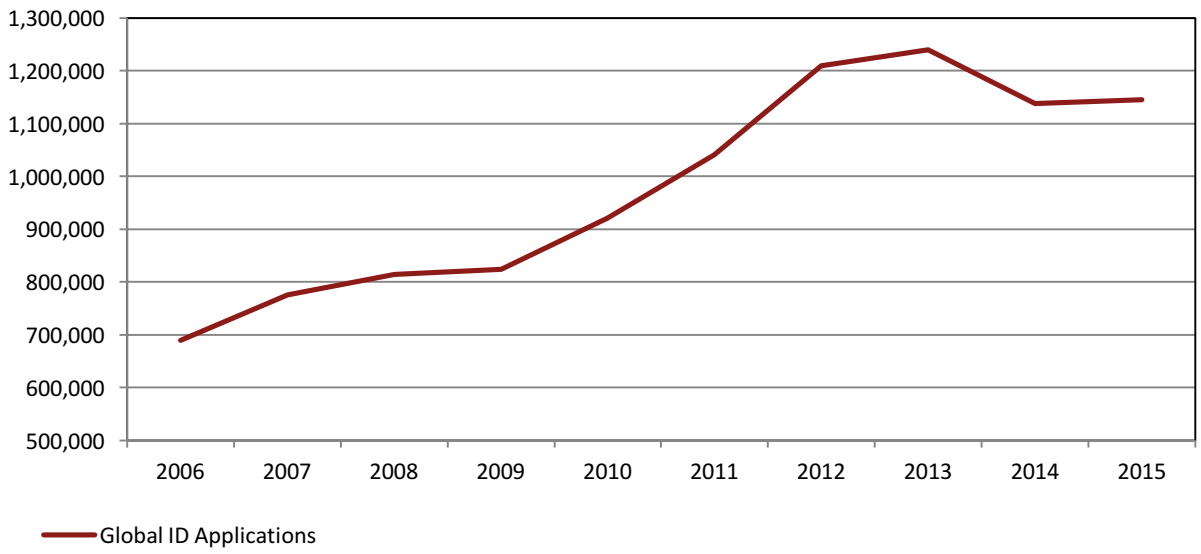
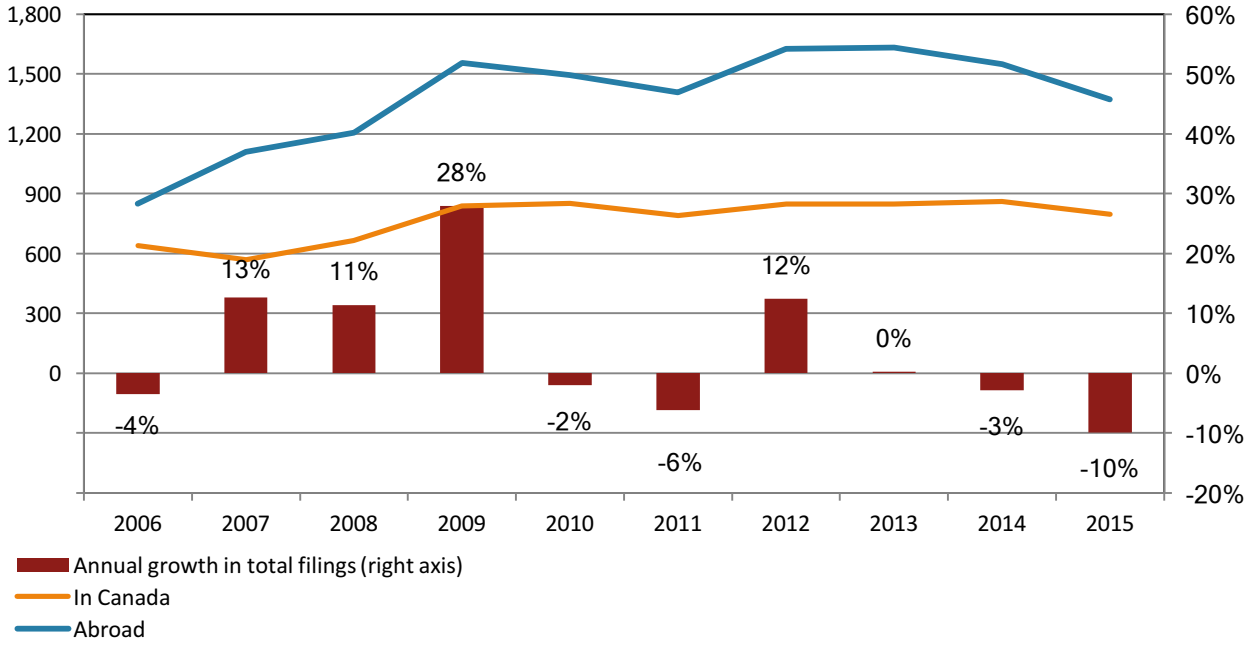


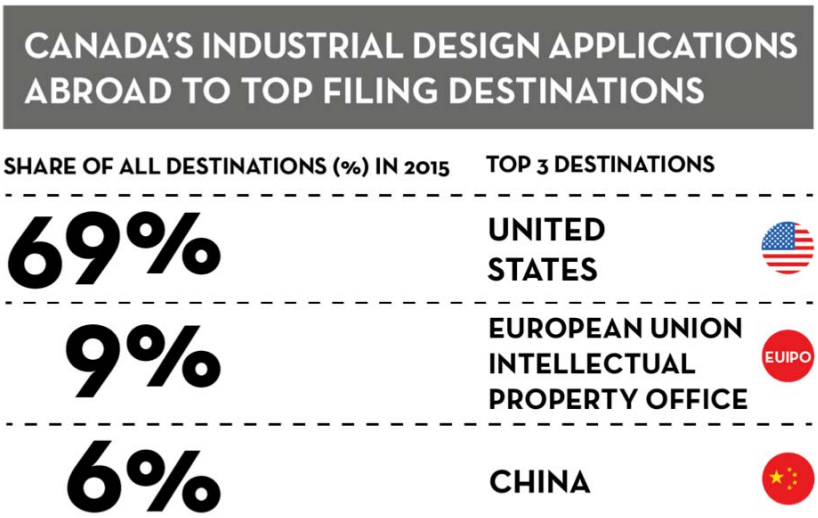

Figure 27 shows that Canadian ID applications abroad have increased by 61% since 2006, from 850 to 1,371. Foreign applications dropped 10% between 2014 and 2015; however, ID applications are highly variable due to the relatively small annual volume. While this variability makes it difficult to compare ID applications to economic activity, it is worth noting that Canadian ID applications abroad have significantly outpaced Canadian exports in the past decade.

**Figure 27 – Industrial design applications filed abroad by Canadians, 2006–2015**




Top filing destinations for ID in 2015 continued to be the U.S., the EUIPO and China, receiving 84% of Canadian applications between them as seen in Figure 28. The U.S. sees the largest proportion of ID filings with 69%. Growth rates from 2006 to 2015 for these offices were 49%, 43% and 100% respectively.

**Figure 28 – Share of Canadian industrial design applications abroad to top filing destinations**




### *Conclusion*

Canadian ID applications abroad have grown more quickly than any other IP right. This reflects the growing importance of ID, supported by the large increases seen in global ID filings and CIPO's own research on increased performance of firms holding ID. Canadians continue to focus their use of ID in the U.S., the EUIPO and China, with the latter seeing the largest increase since 2006 at 100%. CIPO predicts that Canadian use of ID will continue to grow in the long term.

# ECONOMIC IMPACT OF ID

While many studies examine the impact of patents on firm performance, less work has been done on the impact of industrial designs (IDs) on firms. Using data from Canadian publicly traded firms, we employ three methods to identify a positive economic impact on firm revenue and profits from holding industrial designs.

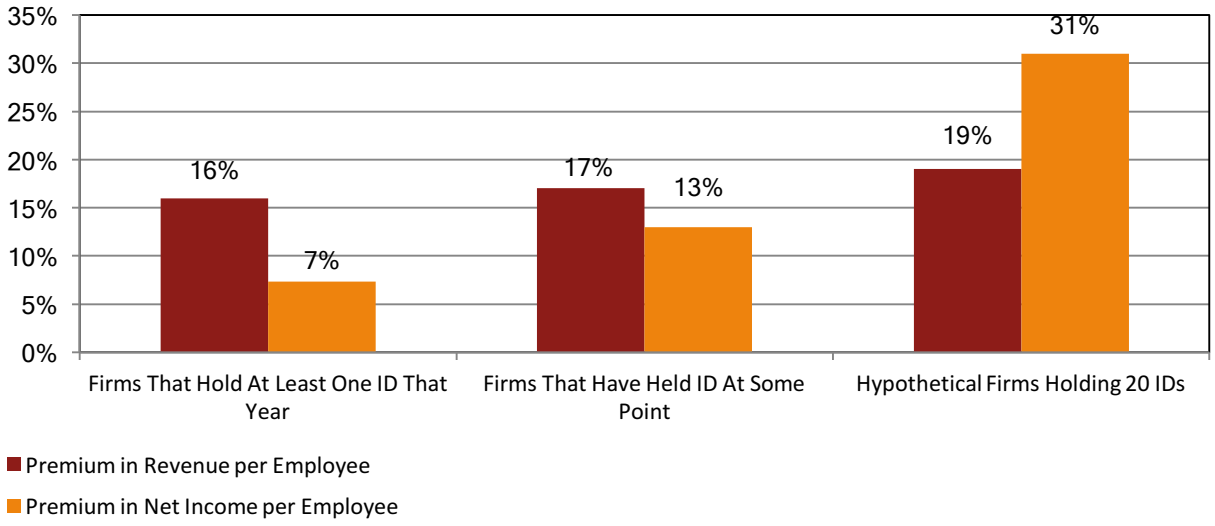
CIPO has conducted research on the economic impact of industrial designs on firm performance. We used financial data from the years 1990–2014 from 723 publicly traded Canadian companies, of which 70 held at least one industrial design. These firms represent a broad sectoral cross-section of the Canadian economy. Three different techniques were used on this data set, producing results that were consistent amongst each other.[xxix] These results indicate an increase in revenue and profit associated with firms holding industrial designs.

With a comparison approach, we found a 16% increase in revenue per employee associated with holding industrial designs. Looking only at the number of IDs held, we found a 0.46% increase in revenue per employee and a 1.2% increase in net income per employee from each additional industrial design registered to a firm.

This research also investigated the impact of the "design orientation" of a firm. Design orientation tries to capture whether the industrial designs are directly causing higher performance, or whether the correlation is due to other activities associated with ID. To shed light on this question, we created a model that described the sector and whether or not firms held at least one industrial design at some point between 1990 and 2014. We found that a firm having ever held ID resulted in a 13% increase in revenue per employee and a 17% increase in net income per employee in addition to the marginal effect of each ID currently held.

In Figure 29, the increases in revenue and income per employee are shown for three different scenarios. The hypothetical firm with 20 industrial designs estimates the premium in both revenue per employee and net income per employee, and captures both the effect of design orientation and the marginal value of each industrial design registration.

**Figure 29 – Impact of ID on firm revenue and profit**




This research suggests that industrial designs are a useful tool for firms to protect their innovations and develop effective product lines that boost revenue and income. While the presence of industrial designs is associated with higher levels of firm performance, the data does not lead to the definitive conclusion that it is the designs themselves having this effect. Future research including data on R&D spending, marketing expenses, firm age and patents could help shed light on this question.

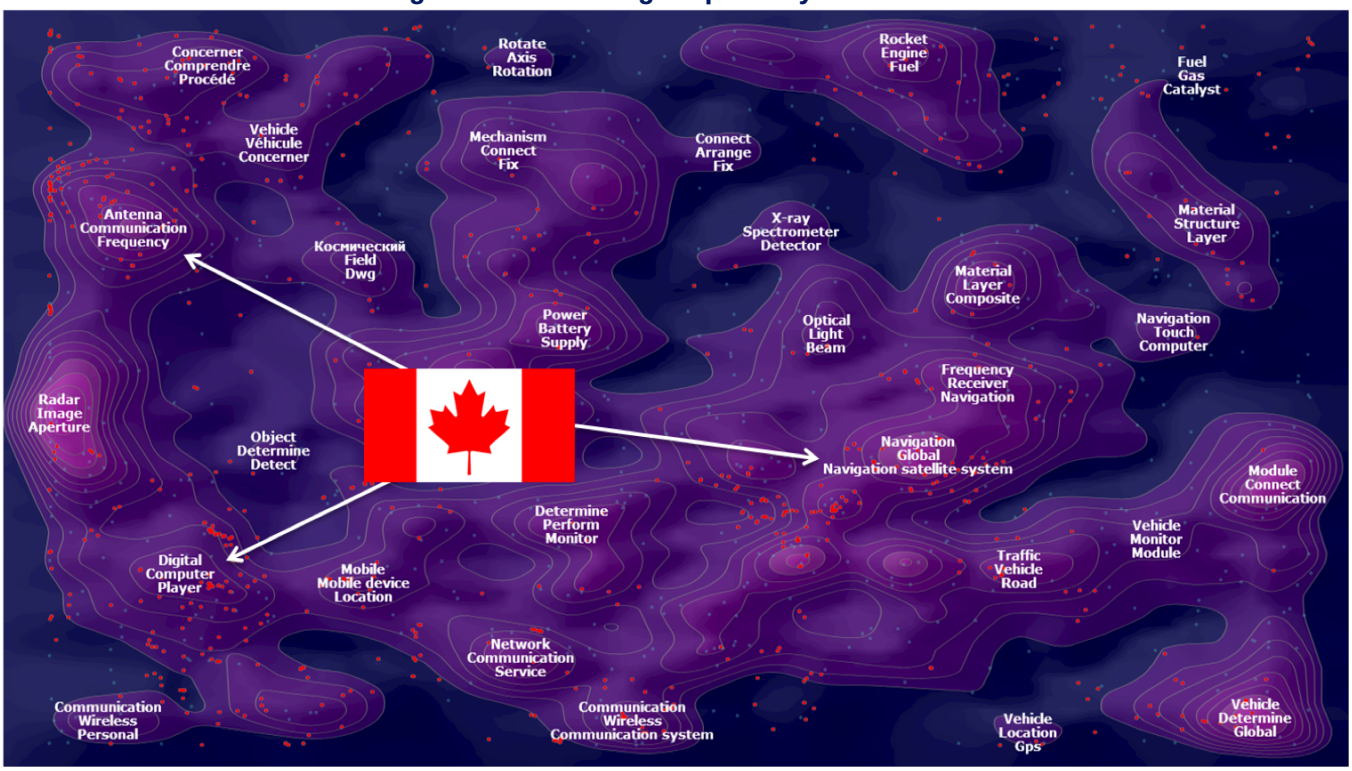
# SPOTLIGHT: PATENTS IN SPACE

Canada plays an important role in the development of space technologies. Over the years, Canada has made several major innovative contributions to the space community, including the Canadarm, which made its debut in 1981, and the RadarSat, a satellite launched in 1995.

CIPO is currently performing a patent analysis of space technologies to highlight the key areas of innovation in this field. This research will provide important information to the top Canadian companies, researchers and inventors in this field regarding the relative levels of patenting activity in different technology domains. According to a 2014 report by the Canadian Space Agency, Canada's space industry added $2.9 billion to gross domestic product that year and supported approximately 25,000 jobs in Canada.[xxx] More than 10,000 of these jobs were full-time equivalent positions directly related to the space sector. Highly qualified personnel such as engineers, scientists and technicians represented 42% of the workforce. This analysis, which should be released by early 2018, will provide interesting insights towards understanding the specific technology areas where Canadians are patenting, given the specialized nature of employees working in the space industry.

The patent landscape map below provides a visual representation of patented inventions worldwide. The map was generated by an algorithm that uses keywords from patent documentation to cluster patents based on shared language. Patents by Canadians are represented on this map by red dots; clusters of these dots represent patents that share more commonality in keywords than with those further apart. Patents are organized in common themes and grouped as 'contours' on the map to show areas of high and low patenting activity. The areas in light purple represent the highest concentration of patents and are labelled with keywords that tie the common themes together. Figure 30 shows that Canadian innovators are very active in areas related to keywords such as "antenna," "communication," "frequency," "digital," "computer," "player," "navigation," "global" and "navigation satellite system."

**Figure 30 – Patenting in space by Canadians**



# CONCLUSION

This report summarizes annual and long-term trends in IP use by Canadians both domestically and abroad. These trends help us to understand the status and direction of IP and its relationships with the Canadian economy. Canadians continue to grow their use of IP globally at a much faster rate than they do domestically. Canadian applications abroad have grown 33% since 2006, over five times the domestic growth rate of 6%. Another trend that reflects the increasing importance of IP in a global business strategy is the increased use of the Patent Cooperation Treaty for applications to the United States. This indicates that Canadian filers not only want patent protection with our primary trading partner, but also in other foreign jurisdictions. CIPO will be acceding to the Madrid Protocol for trademarks and the Hague Agreement for industrial designs. These treaties will provide a harmonized process amongst member countries to facilitate filing in multiple jurisdictions.

Canada is in good position to continue growing its IP activity, particularly in the international domain. As the global economy becomes ever more intertwined, IP rights continue to become more important for protecting intangible assets. This protection will help Canadian innovators to compete and thrive globally in the years to come.

### Economic Research at CIPO: Overview and Purpose

CIPO is conducting economic research around a variety of topics in the IP domain. Research into different areas, such as forecasting for patent and trademark applications, not only helps CIPO to plan more effectively, but also sheds light on Canada's innovation environment. Research into topics such as the profitability of firms holding industrial designs or the relative advantages of Canadian businesses patenting in the space industry gives us an understanding of the areas where IP usage can help Canadians succeed in business, both at home and abroad.

Future research topics at CIPO will include an in-depth look at patenting in the space sector, innovation in the mining sector, and the use of IP by small to medium enterprises, among others. Analysis of the revealed technological advantages in certain sectors and IP collaboration between firms could be useful measures for identifying technology areas where Canada is specialized relative to other jurisdictions and opportunities for potential partnerships.

# APPENDIX A

**CIPO administers Canada's system of IP protection, administering rights in the form of patents, trademarks and industrial designs. Each type of IP protection is designed for different circumstances.**

### *Patents*

Patents provide a time-limited, legally protected, exclusive right to make, use and sell an invention. In this way, patents serve as a reward for ingenuity. Patents apply to newly developed technology as well as to improvements on products or processes.

Patent protection applies in the country or region that issues the patent. In Canada, a patent lasts for 20 years from the date that you file it. Patents can have a great deal of value. You can sell them, license them or use them as assets to attract funding from investors.[xxxi]

In exchange for these benefits, you must provide a full description of the invention when you file a patent. This helps enrich technical knowledge worldwide. Details of patent applications filed in Canada are disclosed to the public after an 18-month period of confidentiality.

To be eligible for patent protection, your invention must be: new (first in the world), useful (functional and operative), and inventive (showing ingenuity and not obvious to someone of average skill who works in the field of your invention). The invention can be: a product (e.g., door lock); a composition (e.g., chemical composition used in lubricants for door locks); a machine (e.g., for making door locks); a process (e.g., a method for making door locks); an improvement on any of these.

In Canada, the first applicant to file a patent application is entitled to obtain the patent. You should file as soon as possible after you complete an invention in case someone else is on a similar track.

Any public disclosure of an invention before filing may make it impossible to obtain a patent. There is an exception in Canada and the U.S. if the public disclosure was made by the inventor or by someone who learned of the invention from the inventor less than one year before filing the patent application. Please be aware that in some countries disclosing the invention to the public anywhere in the world before filing a patent application may, in many circumstances, prevent the inventor from obtaining a patent.[xxxii]

Standard fees are first, small entity fees are in parentheses:

Patent application fee: $400 ($200)
Examination fee: $800 ($400)
Final fee: $300 ($150)
Additional fees may apply
Duration: 20 years
Renewal: Annually

### *Trademarks*

Trademarks can be one or many words, sounds or designs used to distinguish the goods or services of one person or organization from those of others. Over time, trademarks stand for not only the actual goods or service a person or company makes, but also the reputation of the producer. Trademarks are very valuable intellectual property.[xxxiii]

There are three types of trademarks:

**An ordinary mark** is made up of words, sounds, designs or a combination of these used to distinguish the goods or services of one person or organization from those of others. For example, suppose you started a courier business that you chose to call Giddy-up. You could register these words as a trademark (if you met all the legal requirements) for the service that you offer.

**A certification mark** can be licensed to many people or companies for the purpose of showing that certain goods or services meet a defined standard. For example, the Woolmark design, owned by Woolmark Americas Ltd., is used on clothing and other goods.

**A distinguishing guise** is about the shape of goods or their containers, or a way of wrapping or packaging goods that shows they have been made by a specific individual or firm. For example, if you manufactured butterfly-shaped candy you could register the butterfly shape as a distinguishing guise.

Trademark application fee: $250 (online) or $300 (paper)
Trademark registration fee: $200
Duration: 15 years, renewable for $350 (online) or $400 (paper)

### *Industrial designs*

Industrial designs are about how things look. More technically speaking, they are the visual features of shape, configuration, pattern or ornament, or any combination of these features, applied to a finished article. For example, the shape of a table or the shape and decoration of a spoon may be industrial designs.[xxxiv] If you want to register an industrial design, it has to be original. Registering your industrial design will provide you with an exclusive right to your design for up to 10 years after you register.

Industrial design application fee: $400
Duration: 10 years
Renewal: After 5 years (plus 6 months, late fee applies)

# ENDNOTES

i Canadian Intellectual Property Office, Annual Report 2015–2016, Ottawa, 2016. https://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/vwapj/annual-report-2015-2016-eng.pdf/$file/annual-report-2015-2016-eng.pdf

ii Bank of Canada, Monetary Policy Report July 2017, Ottawa, 2017. http://www.bankofcanada.ca/wp-content/uploads/2017/07/mpr-2017-07-12.pdf

iii OECD data

iv Harvard University, Zvi Griliches, "Patents: Recent Trends and Puzzles," Cambridge, Massachusetts, 1989. https://www.brookings.edu/wp-content/uploads/1989/01/1989_bpeamicro_griliches.pdf

v National Bureau of Economic Research, Zvi Griliches, "Patent Statistics as Economic Indicators," Cambridge, Massachusetts, 1991. http://www.nber.org/papers/w3301.pdf

vi OECD data

vii School of Business Administration, University of California, Berkley, David J. Teece, "Profiting from technological innovation: Implications for integration, collaboration and public policy," Berkley, California, 1986. http://www.politicipublice.ro/uploads/technological_innovation.pdf

viii Internal CIPO data

ix WIPO IP Statistics Data Centre (2017 Update). This data is collected from national IP offices by WIPO and then distributed.

x WIPO IP Statistics Data Centre (2017 Update). This data is collected from national IP offices by WIPO and then distributed.

xi WIPO IP Statistics Data Centre (2017 Update). This data is collected from national IP offices by WIPO and then distributed.

xii Internal CIPO data

xiii All signatories to the PCT are also members of the International Patent Cooperation Union.

xiv World Intellectual Property Organization, PCT Yearly Review 2013, Geneva, 2014. http://www.wipo.int/edocs/pubdocs/en/patents/901/wipo_pub_901_2014.pdf

xv Internal CIPO data

xvi Internal CIPO data

xvii Internal CIPO Data

xviii Canadian Intellectual Property Office, Annual Report 2015–2016, Ottawa, 2016. https://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/vwapj/annual-report-2015-2016-eng.pdf/$file/annual-report-2015-2016-eng.pdf

xix WIPO IP Statistics Data Centre (2017 Update). This data is collected from national IP offices by WIPO and then distributed.

xx OECD data.

xxi Internal CIPO data

xxii Canadian Intellectual Property Office, Annual Report 2015–2016, Ottawa, 2016. https://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/vwapj/annual-report-2015-2016-eng.pdf/$file/annual-report-2015-2016-eng.pdf

xxiii OECD Data

xxiv Canadian Intellectual Property Office, Annual Report 2015–2016, Ottawa, 2016. https://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/vwapj/annual-report-2015-2016-eng.pdf/$file/annual-report-2015-2016-eng.pdf

xxv http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/gblec02a-eng.htm

xxvi https://data.oecd.org/gdp/real-gdp-forecast.htm#indicator-chart

xxvii https://data.oecd.org/gdp/gross-domestic-product-gdp.htm#indicator-chart

xxviii WIPO IP Statistics Data Centre (2017 Update). This data is collected from national IP offices by WIPO and then distributed.

xxix Any analysis of IP rights must consider the possible impacts of other forms of intellectual property. Trademarks are generally held by almost all publicly traded Canadian companies. As such, trademark data is not considered in this study. Furthermore, there is the impact of patents to consider. A check that was run using data from CIPO's patent branch showed that of the 64 firms with an ID, 53 also had at least one Canadian patent grant during the period 1990–2014, with the exceptions primarily being in the retail sector. The acquisition of patent stock counts for each of the firms in the sample was beyond the scope of the current project, although this research project could be extended in future. The absence of patent data for all firms means that we cannot rule out the possibility that we are simply measuring the effect of a propensity to hold any types of intellectual property.

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