The Value of Copyright-Based Industries in Canada

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Abstract

Copyright-based industries constitute those parts of the economy which depend on copyright to invest, produce, distribute, and sale. There has been significant interest in the economic exploitation of copyright and related rights in recent years in light of a substantial increase in the investment and growth of copyright-based industries in the world. Moreover, country-specific studies suggest that copyright industries have grown at a faster rate than the whole economy in most countries, signalling their importance for economic growth. This study attempts to fill the gaps in the data and in the economic analysis in this area by estimating the contribution and trend of copyright-based industries in the Canadian economy. The main variables of interest this study explores are the value added and employment. The study is based on the framework developed by the World Intellectual Property Organization (WIPO) to make the international comparison possible. Specifically, the study compares the contribution of the core copyright-based industries in Canada with that of the United States and the European Union. The study also updates and complements previous Canadian studies in this area.

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1. Introduction

Copyright is a legal term which describes the rights that creators have over their literary and artistic works[1]. Copyright is one of the main branches of intellectual property. It applies to "every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression" (WIPO, 2015, p. 22). This includes every original work of authorship, irrespective of its literary or artistic merit. According to the World Intellectual Property Office (WIPO), different types of work protected under most national copyright laws include (i) literary works such as novels, short stories, and poems; (ii) musical works such as songs, choruses, operas, and musicals; (iii) artistic works such as drawings, paintings, and sculptures; (iv) maps and technical drawings such as plans, blueprints, and diagrams; (v) photographic works such as portraits, landscapes, and current events; (vi) motion pictures or cinematographic works such as television broadcasting, film, and dramas; and, (vii) computer programs and databases (WIPO, 2015)[2]. Unlike the protection of inventions[3], copyright law protects only the form of expression of ideas, not the ideas themselves. Protection under copyright, which lasts for the life of the author plus an additional 70 years in most countries[4], is secured automatically when a work is created (USPTO, 2012; OHIM-EPO, 2013).

There has been significant interest in the economics of copyright in the past few years such that, as recorded by WIPO, the demand for economic research on copyright industries has doubled in recent years (WIPO, 2015). The increased interest in the economics of copyright has been driven by a number factors including the shift to a services economy; the adoption of the internet, digital production and distribution; and an increasing understanding of the value

[1] http://www.wipo.int/copyright/en/.
[2] Readers may refer to WIPO (2015) and PwC (2011) for a discussion about different types of copyright and their protection.
[3] E.g. patents, which are covered under patent laws.
[4] Fifty years for some countries like Canada.

attached to intangible assets including copyrights (PwC, 2010). Moreover, research has shown that there are many economic benefits for having a strong copyright sector, such as a perceived positive relationship between foreign direct investment in information industries and copyright protection (Park, 2015). Yet, according to WIPO, the economic effects of copyright had not been specifically analyzed in most countries, and copyright is considered mostly from a regulatory standpoint, which did not link it explicitly to economic policy (WIPO, 2015).

The objective of this study is to assess the contribution of the copyright sector to the Canadian economy. The study uses a revised version of the 2003 WIPO Guide which was adopted by the United States Patent and Trademark Office (USPTO) to conduct a similar study in the United States in 2012. This methodology allows for international comparison of the results when a similar methodology is followed. The study's main variables of interest include value added and employment. However, the study also draws on some measures for international payments and receipts on copyright and the industrial shares of royalty payments.

The structure of the paper is as follows. The next section explains the economic rationale behind copyright. Section 3 explains different methodologies to find the contribution of the copyright sector. This section also explains the WIPO methodology to value copyright. Section 4 reviews previous international and Canadian studies that attempt to find the value of the copyright sector. Section 5 presents the findings of this study. Section 6 examines the relationship between the value added in the copyright sector with that of the rest of the economy. Section 7 concludes.

2. Economics of Copyright

Studying the economic contribution of copyright is based on the recognition that it is a property right. Property rights are defined as "the ability of individuals to own, buy, sell and use

their property in a market economy" (WIPO, 2015). The economic justification for the existence of copyright is that since creative content exhibits some characteristics of public goods[1], namely being both non-rival and non-excludable, there is the possibility of market failure and sub-optimal production of creative content. In practice, even though most creative content is neither fully non-excludable nor fully non-rival, it can still lead to sub-optimal production from an economic point of view (PwC, 2011).

Markets that exhibit public good characteristics will fail because it is difficult to stop non-payers from consuming the product due to the non-excludability characteristics. Accordingly, markets for creative content can fail because once the content is produced, it is difficult to prevent non-payers from consuming the content. That means, consumers can free-ride and benefit from the content without paying for it. The lack of revenue then may reduce the incentive to generate those goods.

Copyright is one potential means to stop free-riding, help creators to recover the costs of their investment, and hence, encourage the production of creative content. Copyright law is also designed to establish the right balance between different economic effects, investing the necessary time in cultural creations, their proper distribution, and the protection and enforcement of the rights involved (WIPO, 2015). Key costs and benefits of copyright can be summarized in Table 1.

[1] A public good has both the following characteristics: (i) The good or service is non-rival in consumption, meaning that consumption by one person does not prevent actual or potential consumption of the same product by another person; (ii) The good or service is non-excludable, meaning that once the product or service is provided, people cannot be easily stopped from consuming it.

Table 1 - Framework of potential costs and benefits of copyright

	Benefits of copyright	Costs of copyright
Short run	• Incentivises the creation of new content • Allows content creators to exercise some control over how their work is used and what it is associated with as well as protecting their revenue and brand	• Administrative and enforcement costs for sellers of rights • Transaction costs and licensing costs for purchasers of rights • Deadweight loss from setting price above marginal cost
Long run	• Supports sustainable business models for creators of new content	• Innovation may be hindered by transaction costs and licensing costs

Source: PwC (2011)

3. Methodologies to Value Copyrights

Measuring the economic contribution of copyright implies studying the activities resulting from the multiple effects of copyright on the economy and on its players such as creators, rights holders, distributors, users, equipment manufacturers, advertisers, etc. Three broad approaches may be used to measure the economic contribution of copyright (PwC, 2011):

i. to focus on the contribution of copyright to economic welfare by capturing the levels of consumers and producers' surplus or benefits from copyright content;

ii. to treat copyright content as an asset and estimate the value of the investment in copyright content by measuring the time spent by authors, artists and musicians creating original works and then estimating the expected return;

iii. to estimate the value added of those sectors of the economy that depend on copyright.

While each of these approaches captures important aspects of the economic value of copyright, none of them alone is comprehensive. The first approach is a theoretically useful concept for policy analysis, but difficult to estimate in practice. In the second approach, the economic value of copyright can be thought of the representation of the net present value of all the future – direct and indirect – benefits from such a right, expressed as a sum of money. One of

the difficulties of this approach is that it is very difficult to capture precisely all direct and indirect economic contribution of the copyright industries especially that there will always be unpriced externalities linked to the public good characteristics of copyright. Consequently, the copyright valuation methods that rely on accounting techniques may lead to huge differences between companies' book values and their market capitalization (Gantchev, 2004).

To measure the economic value of copyright activities across countries, WIPO (2003) has developed a classification of industry sectors which is consistent with the third approach. As part of this classification, WIPO has also identified four classes of copyright industries (WIPO, 2003, 2015; PwC, 2010):

- Core – industries that fundamentally exist in order to produce and distribute copyright materials. These industries are primarily involved in the creation, manufacturing, production, broadcasting and distribution of copyrighted works;
- Partial – industries in which only a portion of the activities is related to copyright and other protected subject matter;
- Interdependent – industries which are engaged in the production, manufacturing, sale, and rent of equipment, and their function is wholly or primarily to facilitate the creation, production, or use of copyrighted works and other protected subject matter;
- Non-dedicated support – industries in which a portion of the activities is related to facilitating broadcast communication, distribution or sale of copyrighted works and other protected subject matter whose activities have not been included in the core copyright industries.

It is important to note that to estimate the impact of non-core industries, a weighting mechanism is usually used to attribute a specific portion of the economic activity of those

industries to copyright. These weights for non-core industries vary from industry to industry and from study to study (Wall Communications; 2004; Grönlund, 2014; Siwek, 2014).

Before explaining the WIPO methodology to value copyright activities in more detail, it is useful to clarify the related terminologies of "copyright", "creative", and "cultural" industries. All three terms are usually used synonymously and refer to those activities or industries where copyright plays an identifiable role. However, there are some differences between them as follows. Copyright industries are those industries that enjoy the protection of copyright and related rights. Cultural industries are defined in some literature as "those industries producing and distributing goods or services which at the time they are developed are considered to have a specific attribute, use or purpose which embodies or conveys cultural expressions, irrespective of the commercial value they may have" (European Union, 2012). The term creative industries usually has a wider meaning and includes, besides the copyright and cultural industries, all cultural or artistic production, whether live or produced as an individual unit (WIPO, 2015).

Regarding the WIPO methodology, in 2003, WIPO published a "*Guide* on *Surveying the Economic Contribution of the Copyright-Based Industries"* with the aim of proposing a common framework to conduct policy research on copyright industries, to measure the size of copyright industries, and to make meaningful comparisons of these industries with other sectors, in each country and between countries. By the end of 2014, this methodology had been applied in over 40 countries and had been recognized as a credible international approach to assess the contribution of copyright to a national economy in terms of value added, employment, and trade (WIPO, 2015).

In 2012, the USPTO published a study which assessed the impact of IP-intensive industries on the US economy. Although the study's methodology to identify copyright-intensive

industries drew heavily from the 2003 WIPO report, the study uses a more narrow definition of copyright-intensive industries than WIPO, focusing on the set of industries that are primarily responsible for the "creation" or "production" of copyrighted materials. While WIPO defines "core" copyright industries as industries which "wholly engaged in creation, production and manufacturing, performance, broadcast, communication and exhibition, or distribution and sales of works and other protected subject matter"[1], the USPTO study excluded industries whose primary purpose was to distribute copyright materials to businesses, consumers, or both (OHIM-EPO, 2013)[2]. The OHIM-EPO published a similar study in 2013 for European countries (European Union), where the study tried to follow the USPTO's methodology as close as possible[3].

While the WIPO methodology has been widely used, its scope and limitations should be recognized before further applying it to other studies (Gantchev, 2004; WIPO, 2015): (i) the studies that use this methodology do not expand into impact studies to suggest causal relationships; (ii) while value added, employment, and trade – the main variables of interest in the WIPO methodology – are still important economic indicators, they are not fully capable of describing the dynamics of copyright-based economic activities, and hence, new indicators need to be developed to better present the dynamic characteristics of economic performance of copyright; (iii) this methodology does not capture the economic impact of copyright legislation;

[1] i.e., industries that either produce copyrighted materials or bring them to market.
[2] i.e., industries that are primarily responsible for the creation or production of copyrighted materials. For example, USPTO (2012) does not count industries such as book, periodical, and music stores (NAICS 4512) or consumer goods rental (NAICS 5322), which includes video rentals, as copyright-intensive even though they are part of the core category in the WIPO (2003). Some of the selected industries are involved in both the production and distribution of copyrighted materials since both functions are often performed within a single business establishment.
[3] In the case of patents and trademarks, USPTO (2012) and OHIM-EPO (2013) define "intensive" industries as the subset of all patent or trademark producers that had high scores in various "intensity" measures. For copyright, the studies define copyright-intensive industries as essentially all industries associated with the production of copyrighted materials.

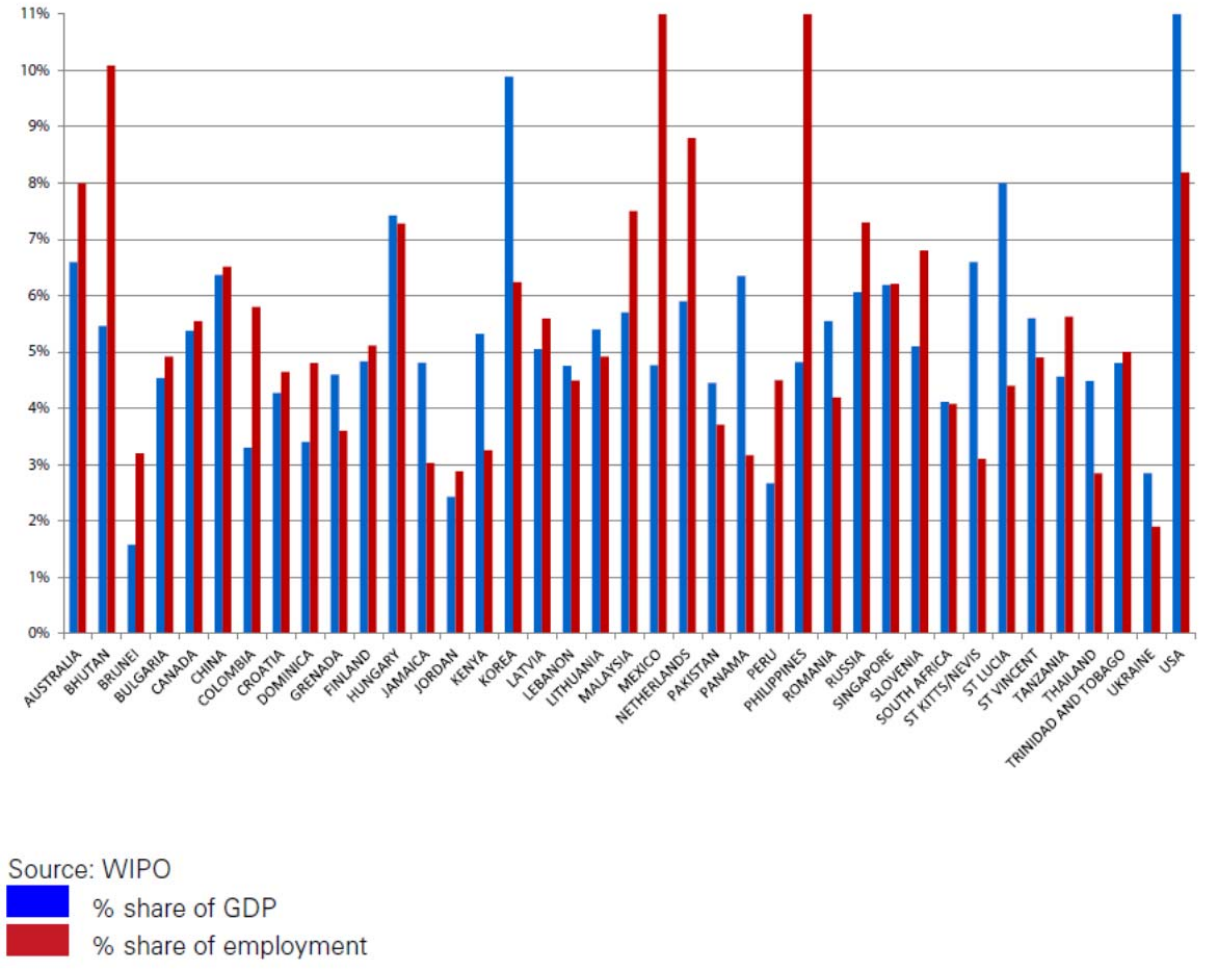
(iv) it does not measure the proportion of counterfeit products circulating on the market; (v) it may leave out some activities with a copyright component; and, (vi) this methodology is unable to differentiate between copyright-related and non-copyright-related activities within a selected industry sector. The next section presents a summary of the studies which aimed at estimating the contribution of copyright to the economy.

4. Previous application of the WIPO method

Several countries have conducted studies to assess the contribution of the copyright-based industries on their economies. Some of these studies have been published by WIPO in eight volumes (WIPO, 2004-2014) with an additional summary report in 2015 (WIPO, 2015). Figure 1 presents a summary of these studies. The contribution to GDP varies significantly across countries from over 10% in the United States to under 2% in Brunei, with an average value of 5.48% across all countries. In many countries, copyright industries have grown at a faster rate than the whole economy both in current and constant terms. These studies also suggest that countries that have experienced rapid economic growth typically have an above-average share of GDP attributed to copyright industries (WIPO, 2015).

Siwek (2014) used the WIPO (2003) methodology to conduct a series of studies to measure the contribution of copyright industries on the US economy. He concludes that in 2013, the value added by the core copyright-based industries to the U.S. GDP reached $1,126.59 billion, accounting for 6.71% of the U.S. economy and that the value added by the total copyright-based industries to GDP reached $1,922 billion, accounting for 11.44% of the U.S. economy. In terms of employment, total copyright industries employed more than 11.2 million workers in 2013, accounting for 8.26% of all U.S. employment.

Figure 1 – Overall contribution of copyright industries to GDP and employment



Source: WIPO (2015)

Note: The year of the study and the copyright shares of the GDP and employment are presented in Appendix 1

Several studies were also conducted to assess the impact of copyrights on the Canadian economy. These studies include Charles et. al (2001), Conference Board of Canada (2008), Statistics Canada (2010), and four studies commissioned or conducted by the Department of Canadian Heritage (PCH), namely, Wall Communications (2004), CONNECTUS Consulting Inc. (2006 and 2009) and Department of Canadian Heritage (2013). The first three studies use slightly different methodologies and apply different definitions to the scope of copyright-based

industries. Therefore, their findings may not be comparable without some adjustments. The studies commissioned or conducted by The PCH follow more or less the original 2003 WIPO report to define the scope of the copyright-based industries.

According to the Department of Canadian Heritage (2013), Canada's core copyright-based industries showed a higher growth rate than the overall economy for the period of 2002-2011. Total value added contribution of the core copyright-based industries in 2011 was $39.1 billion (chain 2002 dollars), accounting for 3.1% of Canada's GDP. The value added of the copyright-based industries grew by 20.3% between 2002 and 2011, slightly higher than the overall economy which grew by 18.4% during the same period. The core and non-core copyright-based industries together accounted for approximately 4.2% of total GDP in 2011. Moreover, the PCH estimated the total number of people employed in copyright-based occupations in 2011 at approximately 645,000, representing 3.7% of all employed Canadians.

This study compares its findings with the latest result of the PCH study. However, the current study deviates from the original 2003 WIPO report and follows the USPTO (2012) and OHIM-EPO (2013) adaptation of the WIPO methodology in order to make international comparison with its peers possible[1]. This kind of international comparison is not possible using the PCH study without making proper adjustments to its estimates. The next section presents the findings of the study. Section 5 also presents the key methodological difference between this study and the PCH study in terms of the GDP and employment.

5. The Value of Copyright-Based Industries in Canada

This section presents the estimation of the value added and employment in core copyright-based industries. The trends in international payments and receipts of copyright and

[1] OHIM (2015) conducted a follow-up study to better understand the effect of IP rights at the firm or company level. However, the copyright section, which was part of the 2013 study, was excluded from the new study.

related rights and the shares of royalties and licence fees in total revenues and total payments of certain industries will also be presented. International comparisons with the United States and European Union are presented when possible.

5.1. Methodology

This study follows the USPTO (2012) study on copyright as closely as possible to make international comparison possible. The USPTO study identifies 13 industries at the 4-digit NAICS level as core copyright-intensive industries. All of these 13 industries are included in the current study. However, due to data limitations, some industries have been aggregated. This leads to 10 distinct industries for the period of 2001-2015. The study includes a larger number of industries as core copyright-based than the PCH studies, while at the same time excludes some other studies. Table 2 presents the core copyright-based industries selected for this study and its comparison with the USPTO and PCH studies.

Statistics Canada made available the value added of the industries NAICS 7111 and 7115 at the aggregate level 71A as "Performing arts, spectator sports and heritage institutions". This aggregation includes both copyright and non-copyright industries. However, the employment data are distinctively available for all of these industries. This study uses the shares of employments of NAICS 7111 and 7115 in 71A to estimate the value added of these two industries. Also, the value added of "Specialized design services" (NAICS 5414) and "Other professional, scientific and technical services" (NAICS 5419) for 2001-2006 and the value added of "Pay and specialty television" (NAICS 5152) and "Other information services" (NAICS 519) for 2001 have been imputed for this analysis.

Table 2 – Core copyright-based industries

No	NAICS	Industry	This paper (value added and Employment)	USPTO (2012)	PCH (2013)	
					Value added	Employment
1	5111	Newspaper, periodical, book, and directory publishers	x[2]	x	x[2]	x
2	5112	Software publishers	x[2]	x	x[2]	
3	5121	Motion picture and video industries	x[2]	x	x[2]	x
4	5122	Sound recording industries	x[2]	x	x[2]	x
5	5151	Radio and television broadcasting	x	x	x	x
6	5152	Cable and other subscription programming	x	x		x
7	5191[1]	Other information services (news syndicates and internet sites)	x	x		
8	5414	Specialized design services (visual and graphic arts)	x	x		
9	5415	Computer systems design and related services (software and databases)	x	x	x	x
10	5418	Advertising, public relations, and related services	x	x	x	x
11	5419	Other professional, scientific, and technical services (photography and translation)	x	x		
12	7111	Performing art companies	x[3]	x	x[3]	x
13	7115	Independent artists, writers, and performers	x[3]	x	x[3]	x

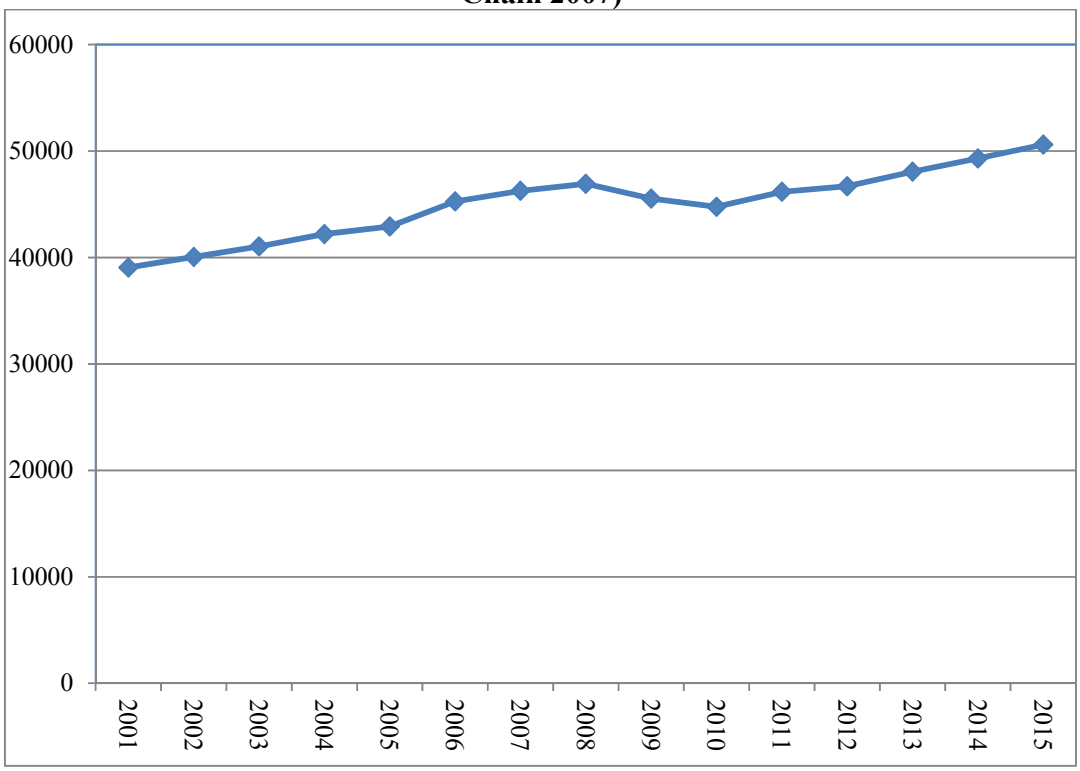
[1] The GDP data for NAICS 5191is available as NAICS 519.
[2] The value added for these industries are available only at three digits 511 and 512. Therefore, both the value added and employment will be presented at the three digit levels for these industries in the following graphs.
[3] The PCH's value added for 7111 and 7115 is [71A] which constitutes "Performing arts, spectator sports and heritage institutions" as the sum of NAICS 711 and 712. This is in effect much larger than the sum of 7111 and 7115. This study uses the labor shares of 7111 and 7115 in total 71A to estimate the value added of these two industries.

5.2. Value added

Figure 2 presents the changes in the value added of core copyright-based industries from 2001 to 2015 in constant (chained) 2007 dollars. The value added of the core copyright-based industries increased from $39 Billion in 2001 to $50.1 Billion in 2015 in constant (chain) 2007 terms. This change constitutes a growth rate of about 30% during this period. Among the core copyright-based industries, the highest growth occurred in "Computer systems design and related services" (NAICS 5415) with 94%, "Pay and specialty television" (NAICS 5152) with 69%, and "Other information services" (NAICS 519) with 57%. On the other hand, some copyright-based

industries such as the "Specialized design services" (NAICS 5414), "Radio and television broadcasting" (NAICS 5151), and "Other professional, scientific and technical services" (NAICS 5419) experienced a decline in their real value added during this period.

Figure 2 – Value added of core copyright-based industries (Millions of Canadian dollars, Chain 2007)

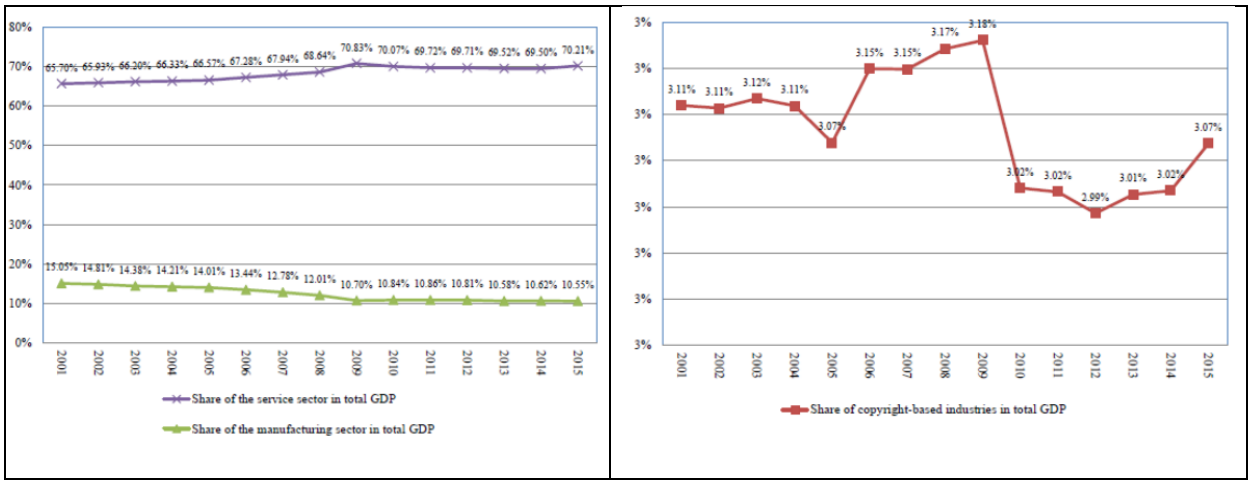


Source: Statistics Canada – CANSIM Table 379-0031

In terms of overall comparison with the economy, the GDP of the country grew by about 31% from 2001 to 2015, the service sector grew by 40.3%, and the manufacturing sector declined by 7.9%, all valued in chain 2007 dollars. This means the core copyright sector grew slower than the entire economy for the period of 2001-2015, in contrast to the PCH (2013) which studied the period of 2002-2011 and the results of most other countries in which the copyright sector generally grew at a higher rate than the entire economy. One explanation for this result is provided after observing Figure 3.

Figure 3 presents the shares of industries in total GDP. The share of the core copyright-based industries in total GDP increased from 3.11% in 2001 to 3.18% in 2009, but then dropped to 3.02% in 2010 and 2.99% in 2012. The share of the copyright-based industries then increased to 3.07% in 2015. During the same period, the share of the service sector in the GDP increased from 65.70% to 70.21%, while the share of the manufacturing sector in the GDP decreased from 15.05% to 10.55%. It should be noted that the 3% share of the copyright-based industries estimated above just belongs to the core copyright-based industries, and hence, the share of all copyright-based industries (i.e. core, partial, interdependent, and non-dedicated support) accounts for a higher percentage of the GDP.

Figure 3 – Share of industries in GDP (%)



Source: Statistics Canada – CANSIM Table 379-0031

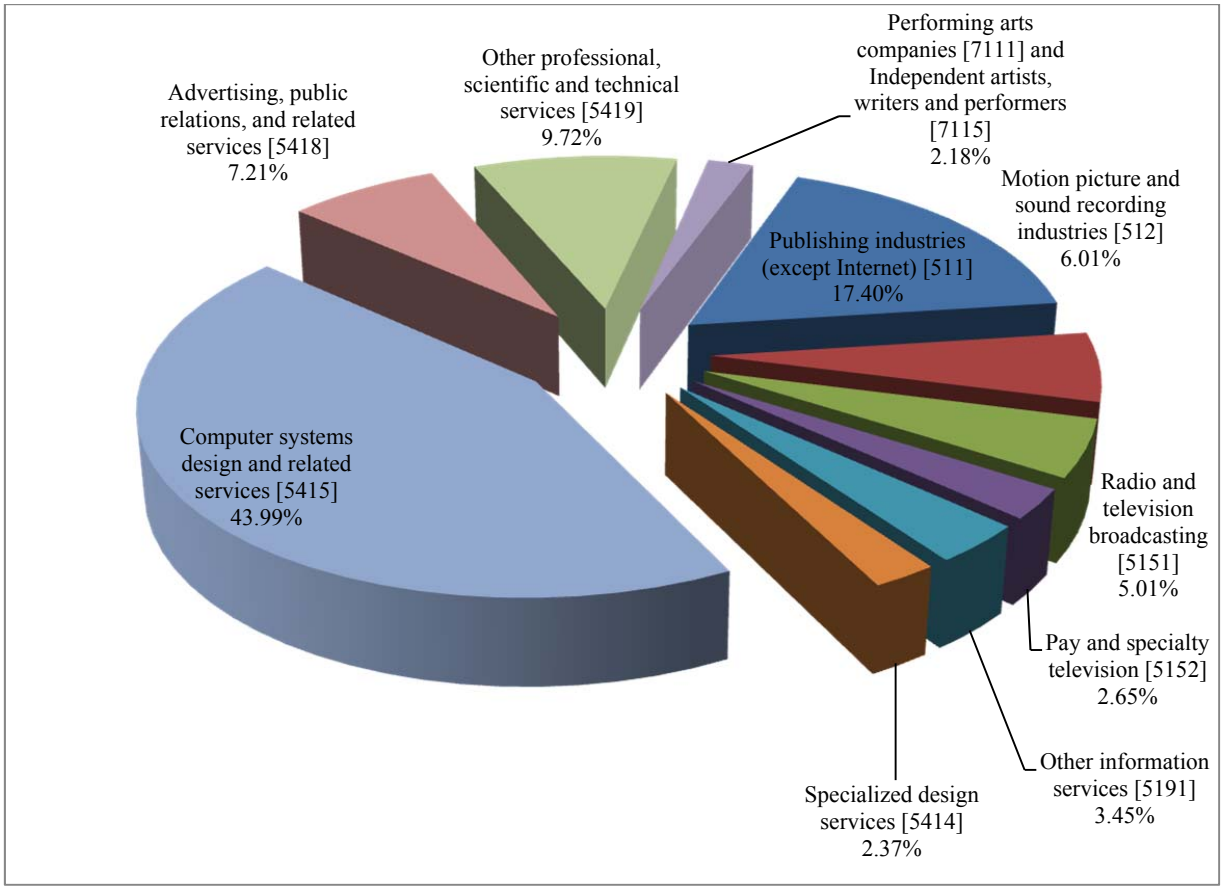
Although these results suggest that the core copyright sector grew slower than the economy as a whole in 2001-2015, a closer look at Figure 3 suggests that the share of the core copyright sector in the economy had been increasing for most years, especially during 2005 to 2009 and 2012 to 2015, where the copyright sector experienced a relatively higher growth rates of 3.62% and 2.53% than the entire economy in the same period of time, respectively. However,

the relative downfalls of the value added of the copyright sector in 2005 and 2010 resulted in a slower average growth of the sector when compared with the entire economy in 2001-2015.

In terms of international comparison, in 2010, the shares of the core copyright-based industries in the GDP of the United States and the European Union were 4.4% and 4.2%, respectively. In 2010, the share of the core copyright-based industries in the GDP of Canada was 3.0%.

As Figure 4 suggests, among the core copyright-based industries in 2015, the largest share of the value added belonged to "Computer systems design and related services" (NAICS 5415) with 43.99%, followed by "Publishing industries (except Internet)" (NAICS 511) with 17.40%, and "Other professional, scientific and technical services" (NAICS 5419) with 9.72%. The rest of the core copyright-based industries have relatively small contributions to the value added. Appendix 2 presents the trends of value added for individual core copyright-based industries from 2001 to 2015.

Figure 4 – Value added shares of copyright-based industries, 2015

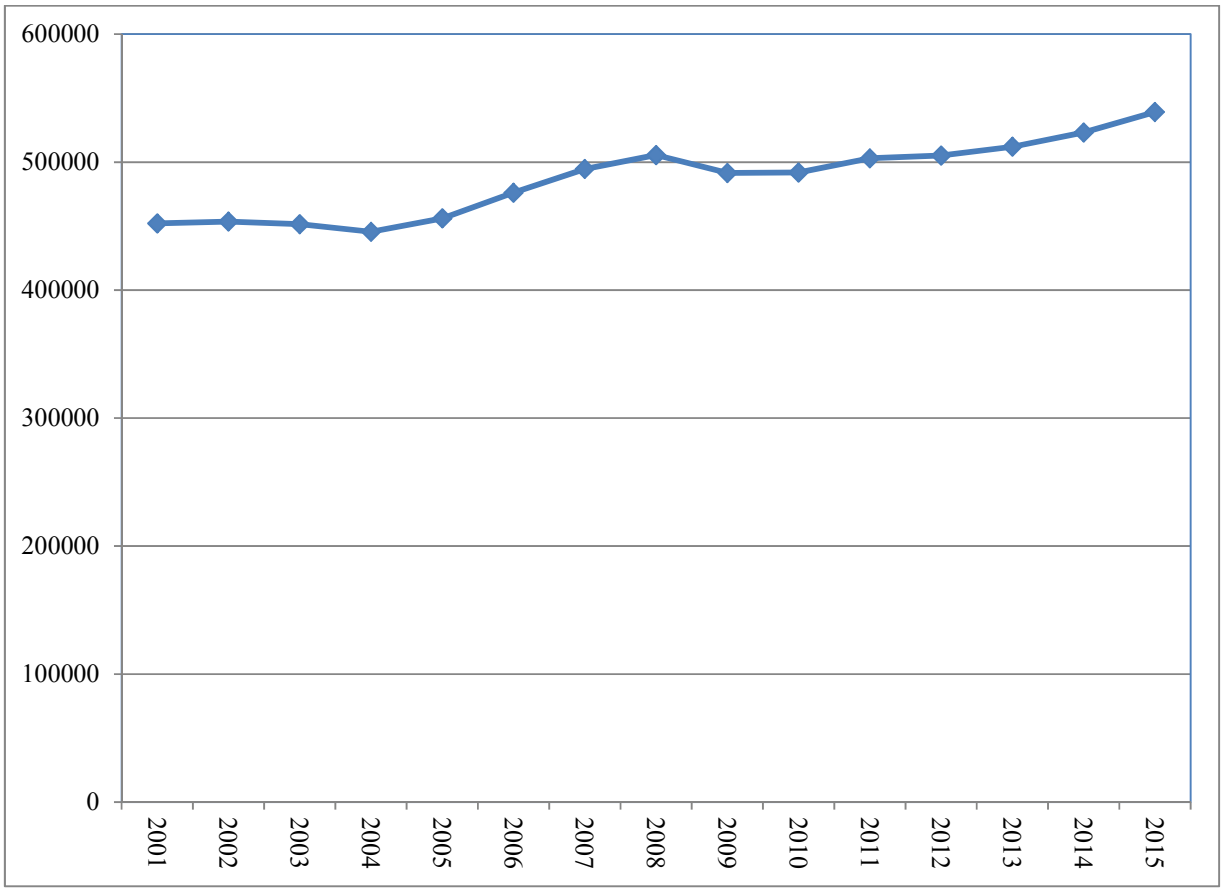


Source: Statistics Canada – CANSIM Table 379-0031

5.3. Employment

Figure 5 presents the changes in employment in core copyright-based industries from 2001 to 2015. Employment in the core copyright-based industries increased from around 425,000 persons in 2001 to around 540,000 persons in 2015. This change constitutes a growth rate of 19.24% during this period. It should be noted that the value added of the core copyright-based industries grew at a higher rate than their employment. Also, both of the employment and value added of copyright-based industries were negatively affected by the 2008 recession.

Figure 5 – Employment in core copyright-based industries (persons)

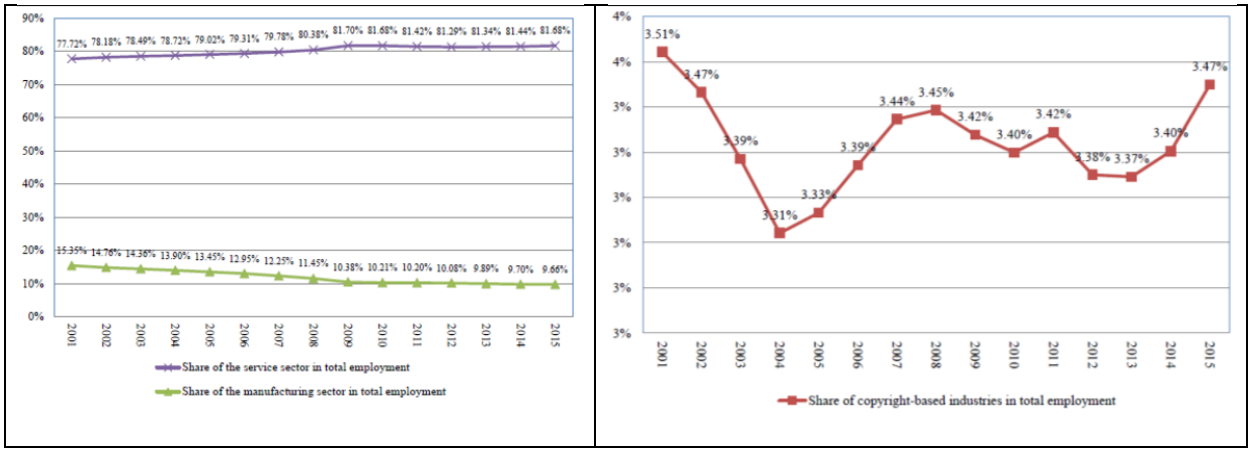


Source: Statistics Canada – CANSIM Table 281-0024

Among the core copyright-based industries in 2001-2015, the highest employment growth occurred in "Pay and specialty television" (NAICS 5152) with 143%, followed by "Other professional, scientific and technical services" (NAICS 5419) with 45% and "Other information services" (NAICS 519) with 42%. It is interesting to note that while the value added of "Computer systems design and related services" (NAICS 5415) experienced the highest growth rate of 94% among the core copyright-based industries between 2001 and 2015, its employment grew only by 27% during this period. Some copyright industries such as "Publishing industries (except internet) (NAICS 511), "Radio and television broadcasting" (NAICS 5151), and "Specialized design services" (NAICS 5414) experienced a slight decline in their employment

during this period. A possible issue in estimating employment in the copyright sector using this statistics is that since T4 tax files[1] are used to estimate this CANSIM table, it may not capture the employment in self-employed enterprises. Assuming that many copyright-related activities are conducted by self-employed persons, these employment estimates for the copyright sector may be underestimated[2].

Figure 6 – Share of industries in employment (%)



Source: Statistics Canada – CANSIM Table 281-0024

In terms of overall comparison with the economy, total employment grew by about 22% from 2001 to 2015, the service sector grew by about 27%, and the manufacturing sector declined by about 24%. Figure 6 presents the shares of industries in total employment. The share of the copyright-based industries in total employment declined from 3.51% in 2001 to 3.47% in 2015. During the same period, the share of the service sector in total employment increased from 77.72% to 81.68%, while the share of the manufacturing sector in total employment decreased from 15.35% to 9.66% (Figure 6). It should be noted that the share of employment in the copyright sector to total employment was in fact increasing on average from 2004 to 2015.

[1] A T4, or a Statement of Remuneration Paid, is an information slip prepared and issued by an employer to tell the employee and the Canada Revenue Agency (CRA) how much employment income the employee was paid during a tax year and the amount of income tax that was deducted. Self-employed persons normally do not have a T4.
[2] The USPTO (2012) study suggests that self-employed persons accounted for 16.5% of all jobs in the copyright sector in the United States in 2010.

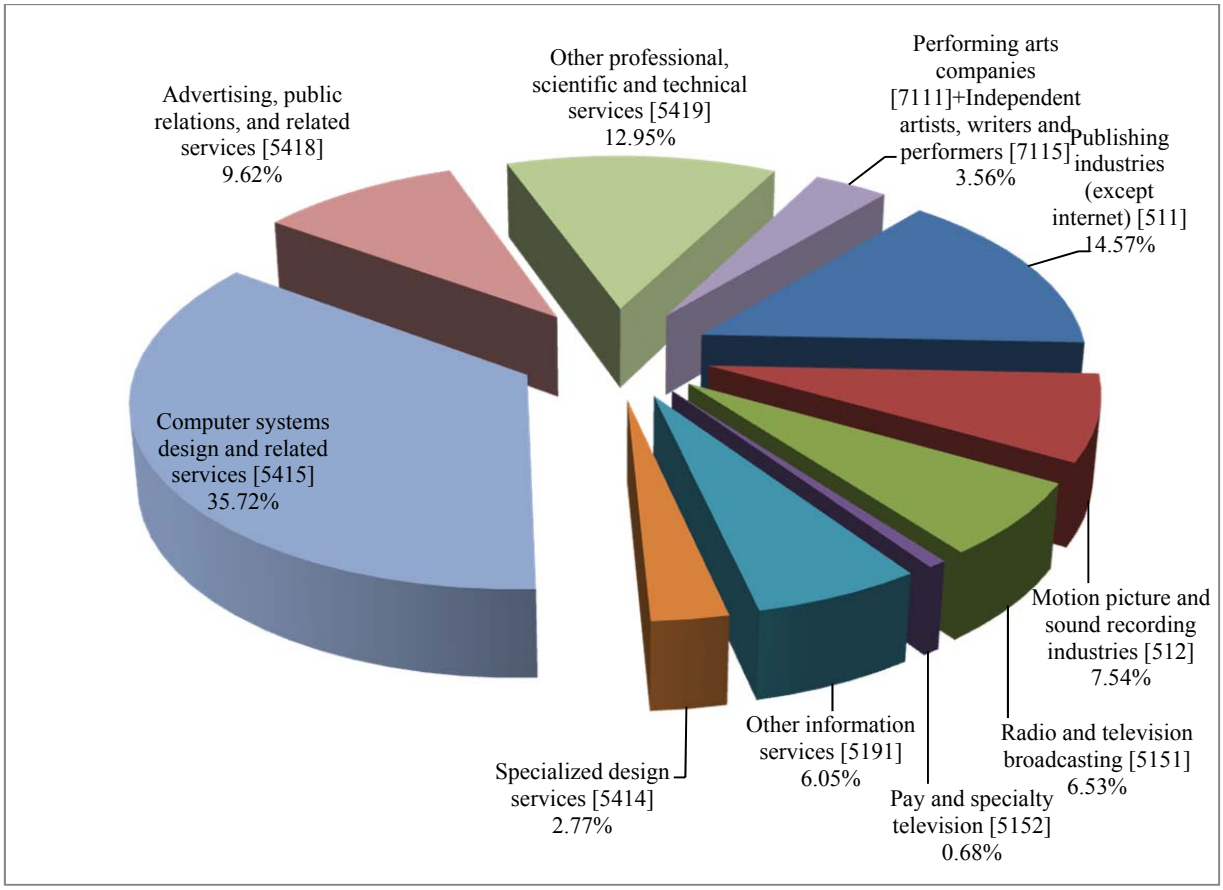
In terms of international comparison, in 2010, the shares of the core copyright-based industries in total employment of the United States and the European Union were 3.5% and 3.2%, respectively. In 2010, the share of the core copyright-based industries in total employment of Canada was 3.4%. Comparing the valued added and employment in the copyright sector of Canada with those of the United States and the European Union suggests that while the core copyright-based industries employ relatively a higher share of employees, they have relatively less contribution to the GDP. Table 3 presents the shares of the value added and employment of the core copyright-based industries in the total economy of Canada, the United Stated, and the European Union in 2010.

Table 3 – Shares of the core copyright-based industries, 2010

	Share of GDP	Share of Employment
Canada	3.0%	3.4%
United States	4.4%	3.5%
European Union	4.2%	3.2%

As Figure 7 suggests, among the core copyright-based industries in 2015, the largest share of employment belonged to "Computer systems design and related services" (NAICS 5415) with 35.72%, followed by "Publishing industries (except Internet)" (NAICS 511) with 14.57%, and "Other professional, scientific and technical services" (NAICS 5419) with 12.95%. Many of the core copyright-based industries have relatively small contributions to employment. Appendix 3 presents the trends of employment for individual core copyright-based industries from 2001 to 2015**.**

Figure 7 – Share of copyright-based industries in employment, 2015



Source: Statistics Canada – CANSIM Table 281-0024

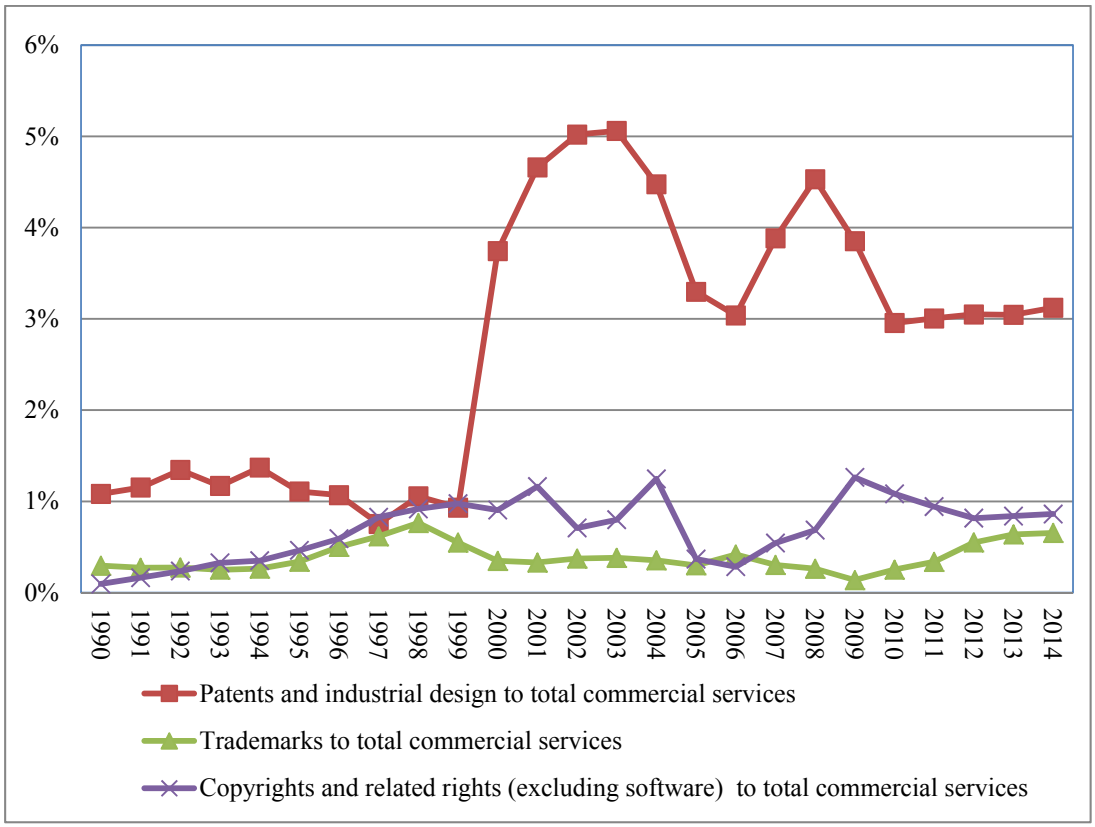
5.4. International receipts and payments of IP rights[1]

In 2014, Canada received $516 million dollars in copyright and related rights while paid $931 million in copyright and related rights. Figures 8 and 9 present the shares of receipts and payments of copyright and other IP rights in the international transactions of commercial services from 1990 to 2014. The shares of copyrights and trademarks receipts in total international commercial receipts were less than 1% in most years. The shares of patent receipts in total international commercial receipts increased from 1% before 1999 to about 5% in 2001-

[1] At the time of writing this paper, the international receipts and payments of IP rights were available only until 2014.

2003, and then declined to about 3% in 2010 and after. The shares of IP right payments in total international commercial payments were double than those of receipts in most years.

Figure 8 – Share of receipts of different IP rights in international transactions of services

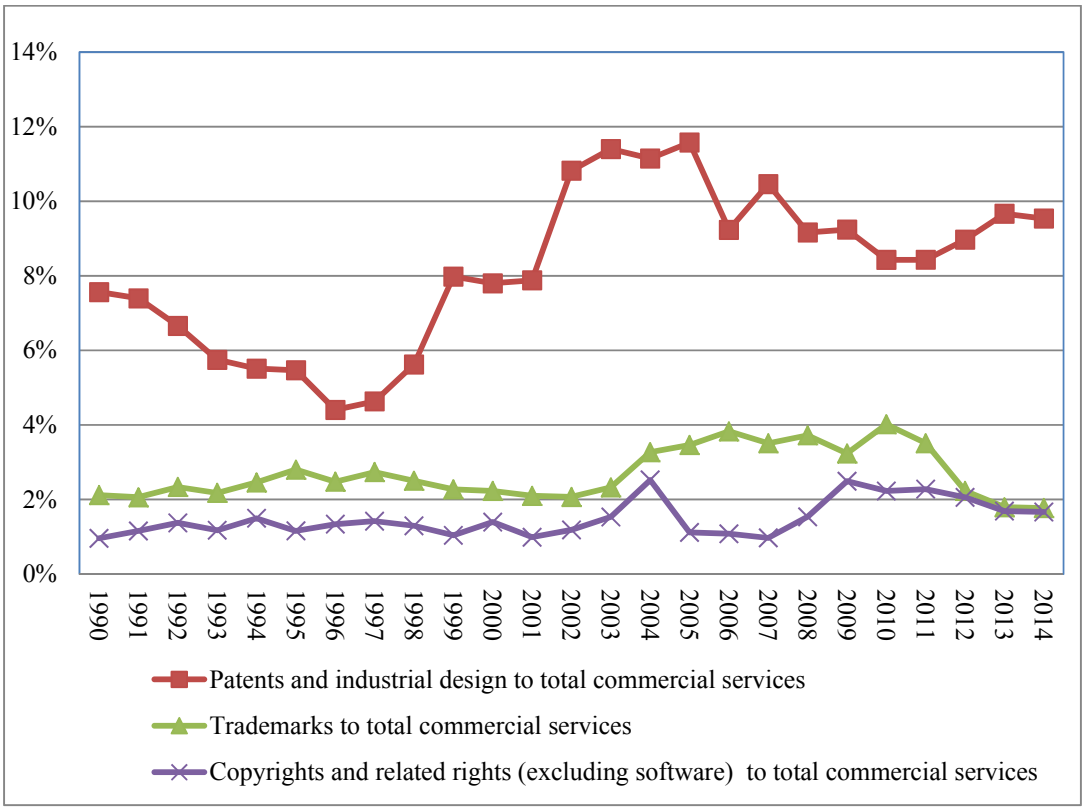


Source: Statistics Canada – CANSIM Table 376-0033

This means Canada is a net payer for IP rights, including copyrights. Since 2010, on average, about 58% of the international receipts of copyright and related rights were from the United States, 27% from Europe, and 15% from the rest of the world. On the other hand, on average, more than 88% of the international payments of copyright and related rights were to the United States, about12% to Europe, and about 8% to the rest of the world in the same period[1].

[1] If these numbers are obtained from tax files, they may be underestimated since many companies may not report details of their international transactions.

Figure 9 – Share of payments of different IP rights in international transactions of services



Source: Statistics Canada – CANSIM Table 376-0033

5.5. Shares of royalties and licence fees in total income

There is not much information about the values and shares of copyright royalties. Tables 4 and 5 provide an incomplete picture of the magnitude of these royalties. Table 4 presents the share enterprises that earn or pay royalties or licensing fees in total enterprises of selected industries. These shares are based on the Survey of Intellectual Property Management (SIPM) conducted in 2010. The definition of these industries does not necessarily match with the definition of the core copyright-based industries adopted in this study. Also, the scope of royalties and licence fees estimated in this table may be broader than just copyright related royalties. Accepting these caveats, Table 4 suggests that a significant portion of enterprises in certain industries earn and pay royalties and licence fees. Among these industries, "Sound

recording industries" with 37% had the highest share of enterprises receiving royalties and licence payments, and close to 50% of the "Broadcasting (except Internet)" enterprises paid royalties and licence fees.

Table 4 – Shares of enterprises earning or paying royalties or licensing fees (2010)

No	Industry	Share of enterprises that earn royalties or licensing fees in total enterprises (%)	Share of enterprises that pay royalties or licensing fees in total enterprises (%)
1	Software (1)	11.5	16.2
2	Broadcasting (except Internet), publishing (except software publishers), and motion picture and sound recording (2)	21.7	17.2
3	Broadcasting (except Internet) (3)	15.4	49.7
4	Publishing (except software publishers) (4)	19.3	17.8
5	Motion picture and sound recording industries (5)	23.6	13.9
6	Motion picture and video industries (6)	22.5	14
7	Sound recording industries (7)	37.1*	12.4

Source: Statistics Canada – CANSIM Table 358-0188

Note: (1) Includes NAICS (2007) codes 5112 and 5415; (2) Includes NAICS (2007) codes 5111, 512, 515, 51911, 51913 and 51919; (3) Includes NAICS (2007) code 515; (4) Includes NAICS (2007) codes 5111, 51911, 51913 and 51919; (5) Includes NAICS (2007) code 512; (6) Includes NAICS (2007) code 5121; (7) Includes NAICS (2007) code 5122. * This number should be used with cautious because of data quality.

In a different framework, Table 5 presents the expenditure shares of "royalties, rights, licensing and franchise fees" in total expenditures of certain industries. As Table 3 suggests, this share varies from 0.4% for "Post-production and other motion picture and video industries" (NAICS 512190) to over 32% and 36% for "Motion picture and video distribution" (NAICS 51212) and "Motion picture and video exhibition" (NAICS 512130), respectively. It should be noted that the scope of the "royalties, rights, licensing and franchise fees" in Table 5 is different from the "royalties and licence fees" in Table 2 and the copyright royalties this study is seeking for.

Table 5 – Share of expenditures on royalties, rights, licensing and franchise fees

No	NAICS	Industry	Share of operating expenses or industry expenditures on "royalties, rights, licensing and franchise fees" (%)	Year
1	511120	Periodical publishers	1	2013
2	511130	Book publishers	7.8	2012
3	51121	Software publishers	4.1	2012
4	512110	Motion picture and video production	0.3	2013
5	51212	Motion picture and video distribution	32.1	2013
6	512130	Motion picture and video exhibition	36.6	2012
7	512190	Post-production and other motion picture and video industries	0.4	2013
8	5122	Sound recording industries	31	2011
9	7111	Performing arts companies	1.9	2012

Source: Statistics Canada
(Based on the Statistics Canada's Survey of Service Industries)

6. Link between the copyright sector and GDP

This section examines whether there is a long-term relationship between the value added of the core copyright-based industries and the rest of GDP, and whether part of the variation in the copyright sector can be explained by changes in the rest of GDP. As a first step, cointegration tests suggest that 6 out of 10 core copyright-based industries examined in this study may have a positive long-run relationship with the rest of GDP[1]:

- Motion picture and sound recording industries (NAICS 512)
- Pay and specialty television (NAICS 5152)
- Other information services (NAICS 519)
- Computer systems design and related services (NAICS 5415)
- Advertising, public relations, and related services (NAICS 5418)

[1] The cointegration test is performed on the value added of each copyright-based industry against the GDP minus the value added of that specific industry.

- Performing arts companies (NAICS 7111) and Independent artists, writers and performers (NAICS 7115)

The copyright-sector in aggregate is also shows a long-term relationship with the GDP. The test suggests that the following copyright subsectors move in the opposite direction of the GDP:

- Radio and television broadcasting (NAICS 5151)
- Specialized design services (NAICS 5414)
- Other professional, scientific and technical services (NAICS 5419)

In the second step and to examine the relationship between the value added of the core copyright-based industries and the GDP, we use the following vector error correction model (VECM) to estimate both the short-run and the long-run relationships between the two data series (Equation 1):

$$\Delta va\_cb_{i,t} = \alpha * va_{cb\,i,t-1} + \beta * gdp_{i,t-1} + \gamma * \Delta gdp_{i,t} + \mu_i + \tau_t + \varepsilon_{i,t}\,, \quad \text{(Equation 1)}$$

where *va_cb* and *gdp* are the logarithms of the value added of the core copyright-based industries and the GDP, μ and τ denote industry and time dummies, Δ denotes the first difference of the variable, ε is the error term, and i = 1,…, 10 and t = 2001,…, 2015 denote industry and time dimensions. Table 6 presents the descriptive statistics of the variables.

Table 6 – Descriptive statistics of variables

Variable	Description (in logarithm)	Mean	Std. Dev.	Min	Max
va_cb	Value added of copyright-based industries	8.00	0.89	6.67	10.01
gdp	GDP	14.20	0.08	14.03	14.32

Table 7 presents the regression results. The regression results confirm the existence of a strong long-term relationship between the value added of the core copyright-based sector and the GDP.

Table 7 – Relationship between the core copyright-based industries and the rest of the GDP

Δ*va_cb*	**All 10 core copyright-based industries**	**Core copyright-based industries excluding NAICS 5151, 5414, and 5419**
lag of va_cb	-0.132 [a]	-0.120 [b]
	(0.047)	(0.059)
lag of gdp	0.201 [a]	0.177 [b]
	(0.068)	(0.071)
Δ*gdp*	-180.420 [a]	-153.729 [b]
	(70.149)	(60.836)
Constant (omitted because of collinearity)	.	.
R-Squared	0.628	0.598
Observations	126	96

a: significant at 1%; b: significant at 5%; c: significant at 10%; Robust standard errors are in brackets; All estimations are based on the random effects generalized least squares (GLS); All variables are in logarithm form; All models include time and industry dummies; Unbalance panel of 10 (7) industries for 15 years (2001-2015).

7. Conclusion

The objective of this study was to estimate the contribution of the copyright sector to the Canadian economy. The study uses a revised version of the 2003 WIPO Guide which was adopted by the USPTO. This methodology estimates the contribution of the core copyright-based industries and allows for international comparison of the results when a similar methodology is followed. For the purpose of this study, the core copyright sector was aggregated to 10 industries to match with the USPTO study. The study covers the period of 2001-2015.

The study suggests that the core copyright-based industries constituted about 3.07% of the GDP and 3.47% of the total employment in Canada in 2015. The share of the core copyright-based industries in the GDP is lower than their counterparts in the United States and the European Union in 2010; however, these industries employed about the same share of employees in total employment as in the United States and the European Union. Among the core copyright-based industries in 2015, the largest share of the value added belonged to "Computer systems

design and related services" (NAICS 5415) with 43.99%, followed by "Publishing industries (except Internet)" (NAICS 511) with 17.40%, and "Other professional, scientific and technical services" (NAICS 5419) with 9.72%. The rest of the core copyright-based industries have relatively small contributions to the value added. In terms of the employment, in 2015, the largest share belonged to "Computer systems design and related services" (NAICS 5415) with 35.72%, followed by "Publishing industries (except Internet)" (NAICS 511) with 14.57%, and "Other professional, scientific and technical services" (NAICS 5419) with 12.95%. Also, regression results suggest a strong long-run relationship between the value added of the core copyright-based industries with the GDP.

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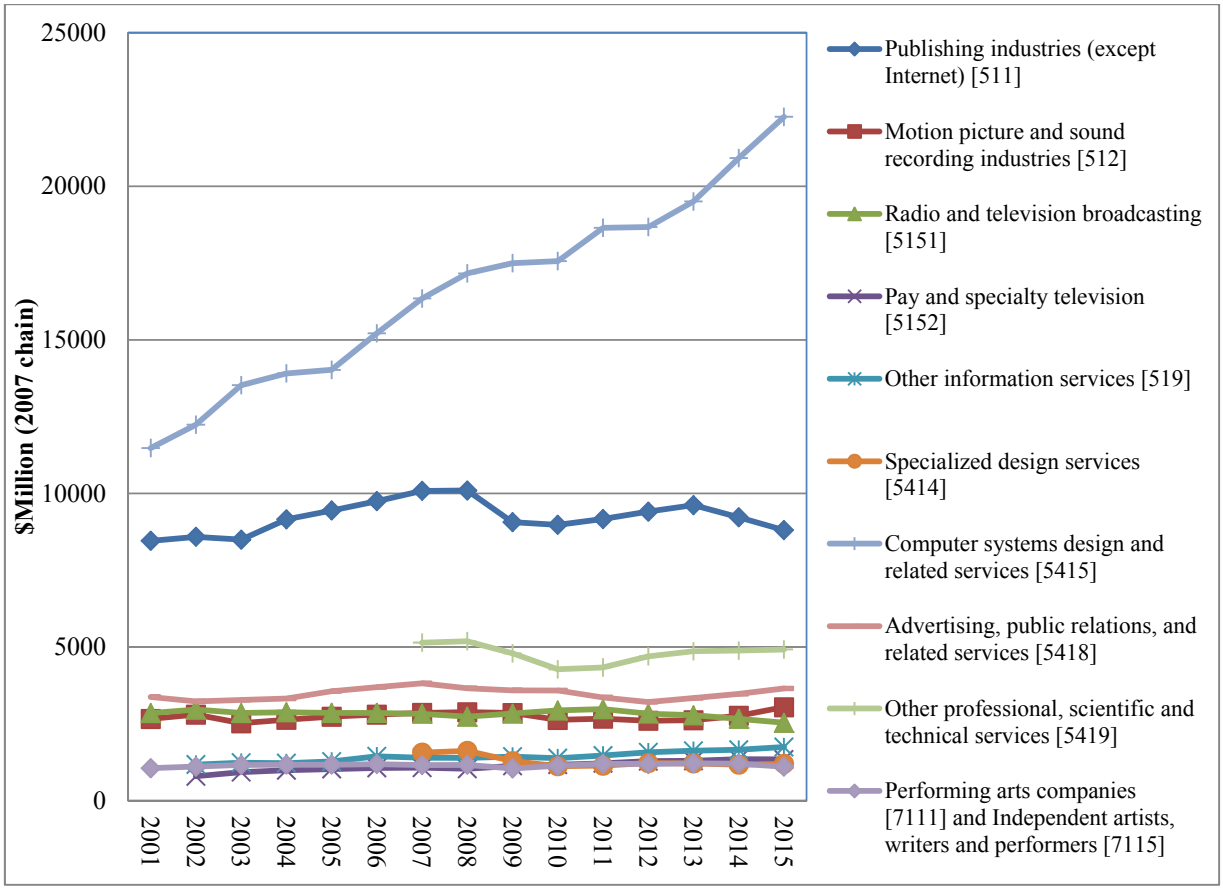
Appendix 1 - International studies on the share of copyright industries in the GDP and employment

#	Country	Reference year	Value added as % GDP	Employment as % total employment	#	Country	Reference year	Value added as % GDP	Employment as % total employment
1	Argentina	2013	4.7	3	23	Malaysia	2008	5.7	7.5
2	Australia	2011	6.6	8	24	Mexico	2006	4.77	11.01
3	Bhutan	2011	5.46	10.09	25	Netherlands	20009	5.9	8.8
4	Brunei Darussalam	2011	1.58	3.2	26	Pakistan	2010	4.45	3.71
5	Bulgaria	2011	4.54	4.92	27	Panama	2009	6.35	3.17
6	Canada	2004	5.38	5.55	28	Peru	2009	2.67	4.5
7	China	2009	6.37	6.52	29	Philippines	2006	4.82	11.1
8	Colombia	2008	3.3	5.8	30	Republic of Korea	2012	9.89	6.24
9	Croatia	2007	4.27	4.65	31	Romania	2008	5.55	4.19
10	Dominica	2012	3.4	4.8	32	Russian Federation	2007	6.06	7.3
12	Finland	2010	4.6	3.6	33	Singapore	2007	6.19	6.21
13	Grenada	2012	4.83	5.12	34	Slovenia	2010	5.1	6.8
14	Hungary	2010	7.42	7.28	35	South	2011	4.11	4.08
15	Indonesia	2013	4.11	3.75	36	St. Kitts and Nevis	2012	6.6	3.1
16	Jamaica	2007	4.81	3.03	37	St. Lucia	2012	8	4.4
17	Jordan	2012	2.43	2.88	38	St. Vincent and the Grenadines	2012	5.6	4.9
18	Kenya	2009	5.32	3.26	39	Tanzania	2012	4.56	5.63
19	Latvia	2004	5.05	5.59	40	Thailand	2012	4.48	2.85
20	Lebanon	2007	4.75	4.49	41	Trinidad and Tobago	2011	4.8	5
21	Lithuania	2012	5.4	4.92	42	Ukraine	2008	2.85	1.9
22	Malawi	2013	3.46	3.35	43	United States of America	2013	11.25	8.35

Source: WIPO (2015)

Appendix 2 - Value added of core copyright-based industries (Millions of Canadian dollars, Chain 2007)



Appendix 3 - Employment in core copyright-based industries (persons)