



# PRIVATE SECTOR CAPITAL EXPENDITURES IN CANADA

An Industry-Level Analysis

Steven Globerman and Joel Emes



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## Executive summary

There has been much debate recently about Canada's industrial competitiveness compared to other developed countries, particularly the US. In particular, concerns have been raised about recent declines in private sector capital expenditures, especially in asset categories such as machinery and equipment that are critical to improvements in productivity.

While much of the focus of the debate has been on Canada's energy industry, those calling for stronger government initiatives to improve the environment for investment in Canada's private sector argue that weak investment performance is widespread across domestic industries. The focus of this essay is to identify whether recent declines in aggregate capital expenditures in Canada's private sector are broadly representative of many (or most) Canadian industries or whether the aggregate decline is limited to only a few, albeit large, domestic industries.

We present evidence that the majority of Canadian industries reduced their capital expenditures over the period 2014–2017. Going back to 1990, it is rare for most industries to reduce their investments in capital assets over as long as a three- to five-year period. This recent experience is especially noteworthy given the absence of a significant recession in the post-2010 period.

While the mining industry (which includes the oil and gas sector) experienced the largest decline in investment from 2014–2017, about two-thirds of our sample of 15 industries experienced a decline over that period. The closest sub-period to 2014–2017 in terms of investment behaviour is 1990–1995, although the latter sub-period had more than twice the number of industries increasing their capital expenditures compared to 2014–2017.

The behaviour of investment in the specific asset categories of machinery and equipment and intellectual property products is similar to that for total capital expenditures. That is, a majority of industries decreased their investments in machinery and equipment plus intellectual property products from 2014–2017. This phenomenon was not observable in any of the other sub-periods in our sample.

The weak recent investment performance documented in this essay augurs poorly for future productivity growth in Canada's private sector and underscores the urgency of tax and regulatory reforms to strengthen incentives for investment and entrepreneurship in Canada's business sector.



## Introduction

There has been much debate in Canada recently about Canada's competitiveness compared to other developed countries. Much of the debate has focused on a recent decline in private sector capital investment, particularly in asset categories that are critical to improvements in productivity such as machinery and equipment.<sup>1</sup> Critics of the Canadian government's tax and regulatory policies have highlighted a flight of capital investment from Canada to other countries, especially to the United States (Oliver, 2018). In particular, critics have pointed to a decrease in inward foreign direct investment to Canada accompanied by large increases in outward foreign direct investment from Canada as evidence that Canada has become a much less attractive location for investment to multinational companies.<sup>2</sup>

While the Canadian government has been reluctant to acknowledge the magnitude and relevance of relatively weak business investment in Canada, the federal government's recent budget at least acknowledged that Canada's environment for business investment is a focus of concern for policymakers. In introducing the budget, Finance Minister Morneau introduced a program of accelerated depreciation allowances, as well as \$365 million in tax credits for mineral exploration.<sup>3</sup> In announcing these measures, Morneau lauded the accelerated depreciation allowances as providing an incentive that will encourage more businesses to invest in Canada, which, in turn, will help drive business growth over the long-term (Wingrove, 2018).

Critics of the federal government's budget argue that the government is seriously underestimating the magnitude of Canada's competitiveness problem, and that stronger measures should have been taken to improve Canada's fiscal and regulatory environment for business investment.<sup>4</sup> Such measures would include reducing corporate and personal tax rates, doing more to

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1. Cross (2017) and Globerman and Press (2018) provide empirical evidence of declines in business capital investment in Canada in recent years.

2. For recent evidence on inward and outward foreign direct investment for Canada, as well as a discussion of the interpretation of the evidence, see Globerman (2019).

3. These measures are set to expire in 2024, unless they are renewed.

4. See, for example, Mintz (2018) and Fuss, Palacios, and Clemens (2018).

eliminate regulatory red tape, and easing legal restrictions on pipeline investments, as well as other policies that have substantially reduced the profitability of investing in Canada's oil and gas sector (Clemens and Veldhuis, 2019). Indeed, much of the focus of concern about government policies inimical to business investment has been on the energy industry (Globerman and Emes, 2019). However, executives in Canada's banking sector have argued prominently that Canada's declining competitiveness is broad-based and is not restricted to the (admittedly) important oil and gas sector (Clemens and Veldhuis, 2019).

The purpose of this essay is to assess the similarity of capital expenditure patterns across a set of Canadian industries. The specific focus is to identify whether recent declines in aggregate investment expenditures are broadly representative of many (or most) Canadian industries or whether the aggregate decline identified in other studies is limited to only a few, albeit large, domestic industries. We present evidence that the majority of Canadian industries reduced their capital expenditures over the period 2014 to 2017, which is the period that has been the focus of other studies documenting Canada's deteriorating competitiveness.

Over the long period from 1990 through 2017, it is rare for a majority of industries to reduce their capital expenditures over as much as a three to five-year period. Hence, our evidence supports a concern that a deteriorating recent investment environment is not restricted to the energy sector. Rather, it seems to be relevant to a much broader set of Canadian industries.



## Conceptual background

Capital expenditures across different industries in an economy will be influenced by similar factors, including overall economic growth, interest rates, nominal tax rates, and the extent of economic and political uncertainty. At the same time, the investment conditions surrounding individual industries will likely differ given differences across industries in factors such as the nature and severity of regulations, effective tax rates, exposure to foreign competition, and other industry-specific factors. Consequently, while one might expect broad similarities across industries in patterns of capital expenditures, especially over extended periods, specific industries may be significant exceptions if they are subject to unique industry-specific conditions.

As noted earlier, much of the concern expressed about Canada's weakening competitiveness has focused on the oil and gas industry. Regulatory restrictions on new pipeline capacity are limiting exports of Western Canadian crude oil and, therefore, contributing to low prices for crude oil with resulting profit declines for domestic oil and gas companies. There have been numerous examples cited in the press of Canadian oil and gas companies reallocating their capital budgets away from exploration and production activities in Canada to Texas and North Dakota.<sup>5</sup> Decreasing capital expenditures by Canadian oil and gas companies will certainly have a substantial impact on total private sector capital expenditures. In this regard, Gliberman and Emes (2019) report that as recently as 2014, capital expenditures for oil and gas extraction accounted for upwards of 28 percent of total Canadian capital expenditures. Hence, it might be misleading to generalize about Canada's industrial competitiveness from the behaviour of total business capital expenditures, since a major investment decline in the oil and gas industry will have a substantial effect on total capital expenditures. Therefore it is useful to look at capital expenditure patterns on an industry-specific basis.

It is also useful to study capital expenditure patterns over a number of decades, if possible. The point here is that if recent capital expenditure behaviour is unusual compared to earlier periods, one has more confidence in concluding that declining investment in Canada is, indeed, a cause for concern,

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5. For a review of this evidence, see Gliberman and Emes (2019).

rather than a temporally recurring pattern that is likely to be reversed with an upswing in business cycle conditions. The earliest year for which a consistent data series can be constructed is 1961. However, given the implementation of the Canada–US Free Trade Agreement in 1989, with its important effects on Canadian productivity performance, it seems more appropriate to begin our sample in 1990. The latest year for which reliable data on investment in fixed non-residential capital is available at the two digit-industry level is 2017. Hence, our analysis of capital expenditures encompasses a sufficiently long period to provide reliable guidance on whether expenditure patterns in recent years are unusual or recurring.

Capital expenditures consist of investment in fixed non-residential capital, including investments in non-residential buildings, engineering construction, machinery and equipment, and intellectual property (IP) products.<sup>6</sup> Machinery and equipment was the largest single asset category for investment in each year from 1990 to 2009. From 2010 to 2017, engineering construction was the single largest asset category. In all but three sample years, non-residential building accounted for the smallest share of total capital expenditures.

As **figure 1** shows, capital expenditures in 2017 were substantially higher than in 1990, although well below the peak level reached in 2014. As seen in figure 1, over any relatively lengthy period, such as from 1990 to 2017, capital expenditures are likely to increase in a growing economy. Hence, if one is interested in evaluating whether recent experience is different from past experience, it makes sense to compare the change in capital expenditures over shorter time periods than the full 28 years for which we have data. We do so by looking at the growth in private sector capital expenditures over (mostly) five-year periods starting in 1990. Specifically, we create index values for capital expenditures using the following base years: 1990, 1995, 2000, 2005, 2010 and 2014. That is, the capital expenditure values in those years are given an index value of 100. Index values for the subsequent years, say 1991–1995, are estimated by dividing the capital expenditure in each of those individual years by the capital expenditure in 1990. Similarly, by dividing capital expenditures in years 2001–2005 by capital expenditures in year 2000, index values are created for years 2001–2005, and so forth.<sup>7</sup> The base year chosen for the final period (2014) reflects previous research indicating that capital expenditures in Canada declined significantly after 2014.<sup>8</sup> Our main objective in this study is to assess the extent of this decline across specific industry sectors, although we are also interested in identifying how different the recent investment experience has been in Canada compared to other relatively short-run investment cycles.

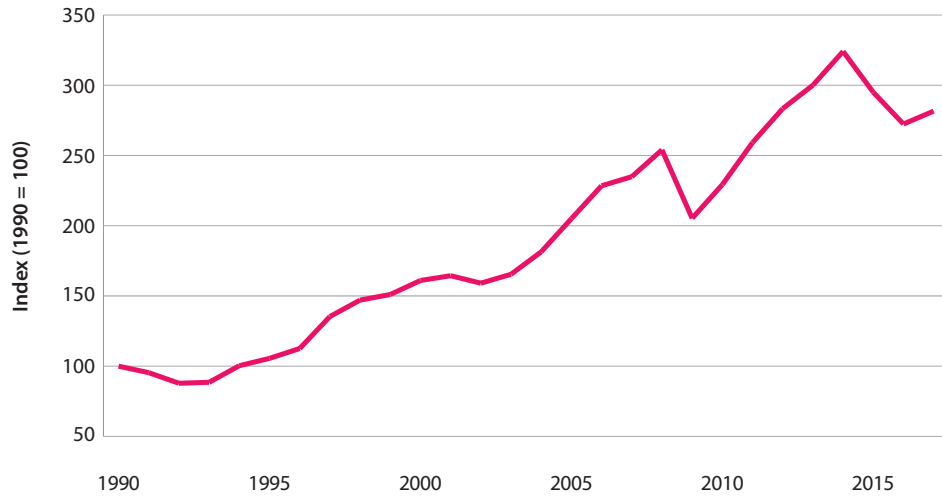
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6. The source of these data is Statistics Canada (2019a).

7. The end year for each sub-period, e.g. 1990–1995, therefore becomes the base year for the next sub-period, i.e. 1995–2000.

8. See Cross (2017).

**Figure 1: Capital Expenditure Index, 1990 to 2017**



Source: Statistics Canada, 2019a.

## Data analysis

**Table 1** presents results for overall private sector capital expenditures expressed as index values as outlined in the previous section. Index values are reported for six distinct periods. In calculating the index values for overall private sector capital expenditures, we exclude several industries. Specifically, we exclude educational services, health care and social assistance, non-profit institutions serving households,<sup>9</sup> and public administration. Given the prominence of governments in determining expenditures in these sectors, including capital expenditures, it seemed advisable to exclude these sectors from an analysis that is concerned with the private sector investment environment in Canada.<sup>10</sup>

In each of the sub-periods (1995–2000; 2000–2005, 2005–2010 and 2010–2014), the index value in the end year is higher than in the base year, indicating that investment expenditures at the end of the sub-period is greater than at the beginning of the sub-period. In only one sub-period (2014–2017) is the index value at the end of the period below the base year value of 100, indicating that investment expenditures declined over that sub-period.

To be sure, there are years within sub-periods where investment expenditures declined. The early 1990s provide one example, while 2001–2002 and 2008–2009 provide others. The early 1990s were a recessionary period in the economy, while 2008–2009 encompassed a severe recession related to the collapse of the housing and financial markets in the US. The sub-period 2014–2017 stands out as being unique in its prolonged contraction of capital investment in the absence of a severe recession.

We did not include 2018 in our time series because, as noted earlier, relevant data on capital expenditures is unavailable at the individual industry level beyond 2017. However, a different data source provides a 2018 estimate<sup>11</sup> for total investment in fixed non-residential capital for our sample industries. Comparing the 2018 estimate to the 2017 estimate from that same data source

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9. A small category built from parts of NAICS 62 (health care and social services) and 81 (other services).

10. The full sample of industries used in this essay is listed in Appendix A

11. See Statistics Canada (2019b).

**Table 1: Capital expenditures index values: Industry aggregate**

Sub-Periods	Year	Value
1990–1995	1990	100.0
	1991	95.4
	1992	87.8
	1993	88.5
	1994	100.3
1995–2000	1995	100.0
	1996	106.7
	1997	128.2
	1998	139.3
	1999	143.1
	2000	152.5
2000–2005	2000	100.0
	2001	102.1
	2002	98.8
	2003	102.7
	2004	112.7
	2005	127.3
2005–2010	2005	100.0
	2006	111.4
	2007	114.6
	2008	123.9
	2009	100.1
	2010	111.8
2010–2014	2010	100.0
	2011	113.0
	2012	123.6
	2013	130.9
	2014	141.4
2014–2017	2014	100.0
	2015	91.0
	2016	84.0
	2017	86.9

Source: Statistics Canada, 2019a.

shows that the 2018 estimate is essentially the same as the value for 2017.<sup>12</sup> Hence, we infer that the index value of total capital investment in 2018 would be about the same as in 2017, and the index value in the final year of the five-year period (2014–2018) would be well-below 100. Clearly, private sector capital investment post-2014 has been the weakest period for such investment since 1990 whether 2017 or 2018 is used as the end date for our series.

**Table 2** provides information relevant to the issue of whether decreasing capital investment was a broadly based phenomenon in recent years or whether it was isolated to a few industries, primarily the energy sector. It also provides additional information on the degree to which the capital expenditure experience of earlier sub-periods is similar to the experience of 2014–2017. Since industry-level data on capital expenditures is available only at the two-digit level, the industry categories are relatively broad. For example, the oil and gas sector is included as part of the broader mining industry classification, while manufacturing includes all primary and secondary manufacturing industries.<sup>13</sup>

In table 2, we report the number of industries for which the end period index value of capital expenditures is higher than the beginning period value, as well as the number of industries for which the end period index value of capital expenditures is lower than the beginning period index value. The beginning index value for each sample period is always set equal to 100 as noted above. We also report the simple and weighted percentage of the total industry sample for which the end period value of capital expenditure exceeds 100 indicating that capital investment increased over the period. The weighted percentage is calculated by adding the capital expenditures in each industry for which the index value exceeds 100 and then dividing the sum by the total capital expenditures for the industry total in the relevant five-year sub-period.

<sup>12</sup>. This second data source does not disaggregate asset categories by type which makes it a less informative source of data than the source underlying the reported figures and tables

<sup>13</sup>. The list of the two-digit (North American Industry Classification System) industries in our sample is again provided in Appendix A. Primary manufacturing involves the retrieval and production of raw materials. Secondary manufacturing involves the transformation of raw or intermediate materials into goods.

**Table 2: Industries with higher/lower end period values**

Sub-Periods	Higher	Lower	Percent higher	Weighted percent higher
1990–1995	11	4	73.3%	66.7%
1995–2000	15	0	100.0%	100.0%
2000–2005	12	3	80.0%	81.1%
2005–2010	11	4	73.3%	71.2%
2010–2014	13	2	86.7%	92.1%
2014–2017	5	10	33.3%	37.1%

Source: Statistics Canada, 2019a.

The information reported in table 2 shows that the period 2014–2017 is, again, unique in that it is the only sample period for which the number of industries characterized by decreasing capital expenditures exceeds the number of industries characterized by increasing capital expenditures. The specific industries with decreasing capital expenditures include agriculture, mining, quarrying and oil and gas extraction, utilities, manufacturing, wholesale trade, retail trade, professional, scientific and technical services, administrative services, accommodation, and other services. The industries experiencing increases include construction, transportation, information and culture industries, finance, and arts and entertainment. The closest sub-period in experience to 2014–2017 is 1990–1995, although the latter sub-period had more than twice the number of industries increasing their capital investments compared to 2014–2017. The percentage of industries with increasing capital investments in sub-periods other than 1990–1995 was even higher when compared to 2014–2017.

A potential concern about the information reported in table 2 is that the identification of an industry as exhibiting an increase or decrease in capital expenditures relies solely upon a comparison of the index value at the end of each sub-period to the beginning sub-period value of 100. It might be that the yearly index values for any sub-period increased consistently until the last year before declining substantially. A sufficiently large decline in the final year might result in the index value for the final year being below 100. If so, the industry would be classified as having reduced its capital expenditures for that sub-period. While this would be true, strictly speaking, it is a qualitatively different capital expenditure experience than if the yearly index values decreased on average over the entire sub-period. A symmetrical concern arises to the extent that the index value in the last year of any sample period is much larger than 100, even though the index series for the intervening years between the beginning and end of the sub-period is declining.<sup>14</sup>

<sup>14</sup> In brief, end-of-period outliers for individual sub-periods can lead to potentially misleading inferences.

We attempt to mitigate this potential concern by calculating the average of the index values for each year of a given sub-period including the initial year. For example, in **table 3**, the average value reported for 1990–1995 is the average of the index values for each individual year from 1990 to 1995. We can interpret the information reported in table 3 as showing whether capital expenditures increased or declined, on average, during each sub-period. Specifically, an average value exceeding 100 indicates an average increase in capital expenditures in the sub-period, while an average value below 100 indicates a decrease. The averaging process reduces, although does not eliminate, the influence of the last year’s index value in a determination of whether capital expenditures increased or decreased. In table 3, we report the average index value for each sub-period for each of our sample industries.

**Table 3: Average index values for sub-periods**

	1990–1995	1995–2000	2000–2005	2005–2010	2010–2014	2014–2017
<i>Industry aggregate</i>	96.3	128.3	107.3	110.3	121.8	90.5
Agriculture, forestry, fishing and hunting	111.3	118.4	96.3	113.7	115.1	95.6
Mining, quarrying and oil and gas extraction	121.7	124.1	128.6	114.2	135.6	71.3
Utilities	91.3	96.4	137.5	130.7	133.4	94.5
Construction	105.9	121.8	102.0	126.0	110.0	100.4
Manufacturing	89.3	120.7	90.7	94.1	112.1	99.6
Wholesale trade	134.6	129.2	109.5	116.4	110.4	89.6
Retail trade	127.9	108.3	127.1	112.5	110.3	96.9
Transportation and warehousing	111.7	161.6	95.3	131.8	140.4	109.7
Information and cultural industries	94.2	142.1	108.4	88.4	101.7	108.6
Finance, insurance, real estate, rental and leasing	75.5	147.2	97.2	99.2	92.4	111.2
Professional, scientific and technical services	158.2	151.5	88.9	121.6	113.7	96.3
Administrative and support, waste management and remediation services	134.8	111.8	126.2	154.0	130.6	79.8
Arts, entertainment and recreation	85.7	123.7	122.7	118.9	147.0	124.3
Accommodation and food services	77.3	136.7	159.4	117.0	120.4	98.4
Other services (except public administration)	135.9	106.6	119.4	105.4	91.6	94.0

Source: Statistics Canada, 2019a.

The vast majority (around two-thirds) of average index values reported in table 3 are positive. That is, capital expenditures increased, on average, in about two-thirds of the sub-periods across the full sample of industries. The sub-period 2014–2017 is an obvious exception. Specifically, capital expenditures decreased for 10 of the 15 sample industries during the 2014–2017

sub-period. The closest sub-period to 2014–2017 is 1990–1995, when capital expenditures decreased, on average, for six of the 15 sample industries. The data reported in table 3 therefore reinforces our conclusions from earlier tables. Namely, capital investment weakness is widespread across two-digit industries over the sub-period 2014–2017. Indeed, it is the only sub-period during which capital expenditures declined, on average, across the majority of industries.<sup>15</sup>

Finally, we focus on capital expenditures on machinery and equipment and intellectual property products. These are investments that are particularly likely to improve industrial productivity and wages, and an earlier study documents that aggregate capital expenditures on these two asset categories was especially weak during the period 2014–2017 (Globerman and Press, 2018). We employ the same procedure as used to create table 3. In particular, we use the same sub-periods and the same averaging procedure as used for table 3, only we include capital expenditures solely for machinery and equipment plus intellectual property products. The estimates are reported in [table 4](#).

**Table 4: Average index values for sub-periods, M&E and IPP only**

	1990–1995	1995–2000	2000–2005	2005–2010	2010–2014	2014–2017
<i>Industry aggregate</i>	102.3	132.1	103.8	101.4	108.3	96.9
Agriculture, forestry, fishing and hunting	116.9	115.9	98.2	107.9	119.7	92.1
Mining, quarrying and oil and gas extraction	112.9	146.8	127.2	110.7	113.8	70.6
Utilities	88.7	101.4	117.6	114.9	135.5	92.4
Construction	111.4	122.4	99.3	125.7	110.3	100.8
Manufacturing	95.0	118.8	95.0	90.9	104.0	104.8
Wholesale trade	140.3	134.4	105.5	114.0	111.8	90.1
Retail trade	140.0	110.0	115.6	111.8	102.4	98.7
Transportation and warehousing	112.6	178.7	109.3	106.1	123.6	113.1
Information and cultural industries	102.7	139.5	114.7	87.9	99.8	106.3
Finance, insurance, real estate, rental and leasing	89.9	147.8	94.7	93.2	90.0	109.7
Professional, scientific and technical services	160.7	145.2	90.0	118.5	113.8	95.7
Administrative and support, waste management and remediation services	131.0	107.5	123.8	149.0	116.4	84.9
Arts, entertainment and recreation	117.0	112.9	136.3	110.1	124.6	102.4
Accommodation and food services	96.0	131.1	140.7	94.3	125.1	106.2
Other services (except public administration)	139.8	105.8	120.9	103.4	93.3	91.3

Source: Statistics Canada, 2019a.

<sup>15</sup> Since each sub-period is indexed to a base year value of 100, one should not directly compare the average values reported in table 3 across sub-periods as measures of relative or absolute differences. For example, the average index value for 2014–2017 is 90.5, while it is 96.3 in 1990–1995. This should not be interpreted as showing that investment in 2014–2017 was approximately 6 percent lower than in 1990–95.



The data reported in table 4 show that as in the case of investments on all capital assets, the average investment index in each sub-period is positive for the majority of industries with the exception of 2014–2017. In this sub-period, eight of the 15 sample industries experienced a decline in the average index value for expenditures on machinery and equipment plus intellectual property products. That is, the average index value was below the base year value of 100. Not surprisingly, mining, quarrying, and oil and gas extraction had the lowest average index value for the sub-period 2014–2017. This undoubtedly reflects the sharp drop in the price of crude oil from 2014–2016. However, declines in average index values are identified for seven other industries, as well, over the 2014–2017 subperiod, albeit not as dramatic as in the case of mining, quarrying, and oil and gas extraction. The sub-period with the next largest number of industries for which the average index value was below 100 is 2000–2005, for which five industries show investment declines.

It is interesting to note that a greater number of industries exhibited a decrease in overall capital expenditures than in capital expenditures on machinery and equipment plus intellectual property products during the sub-period 2014–2017. This reflects the fact that two industries (manufacturing – NAICS 31-33, and accommodation and food services – NAICS 72) had average index values greater than 100 in the 2014-2017 period for capital expenditures on machinery and equipment plus intellectual property products but less than 100 for total capital expenditures. Notwithstanding, the weak investment performance for machinery and equipment and intellectual property products in recent years augurs poorly for future productivity growth in Canada's private sector.

## Concluding comments

The collapse in capital investment in the oil and gas sector post-2014 is well known, and this collapse has been linked to a decline in overall capital investment in Canada in recent years. Less well documented is the breadth of the decline in capital investment across a range of industries. This essay identifies the behavior of capital expenditures over various sub-periods since 1990 for 15 industries. It shows that non-residential private sector investment experienced an overall decrease post-2014 that is unique in the post-1990 period. Also unique is the breadth of this decline across industries in the post-2014 period. More industries experienced decreases in non-residential capital investment post-2014 than in earlier sub-periods, even though there were no major recessions in the past few years comparable to recessions in the early 1990s and in 2008–2009.

Machinery and equipment and intellectual property products are particularly important asset categories inasmuch as they are critical to improvements in productivity. As is the case for overall capital expenditures, the post-2014 period is characterized by broad weakness across our sample of industries in capital expenditures for these two specific asset categories. This latter development augurs poorly for future growth in industrial productivity in Canada in the absence of policy changes that improve the investment environment in Canada's private sector. While the oil and gas industry has suffered most from a deteriorating competitive environment, competitiveness problems, particularly in the face of tax and regulatory regime changes in the US under the Trump Administration, are adversely affecting investment across a broader range of Canadian industries.

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# Appendix

## Included industries: North American Industry Classification System

1. Agriculture, forestry, fishing and hunting (11)
2. Mining, quarrying and oil and gas extraction (21)
3. Utilities (22)
4. Construction (23)
5. Manufacturing (31–33)
6. Wholesale Trade (41)
7. Retail Trade (44–45)
8. Transportation and warehousing (48–49)
9. Information and culture industries (51)
10. Finance and insurance (52–53)
11. Professional, scientific and technical services (54)
12. Administrative support, waste management & remediation services (55–56)
13. Arts, entertainment and recreation (71)
14. Accommodation and food services (72)
15. Other services (except public administration) (81)

## Excluded industries: North American Industry Classification System

1. Educational services (61)
2. Health care and social assistance (62)
3. Non-profit institutions serving households (parts of 62 & 81)
4. Government sector (91)

## About the authors



### Steven Globerman

Steven Globerman is Resident Scholar and Addington Chair in Measurement at the Fraser Institute as well as Professor Emeritus at Western Washington University. Previously, he held tenured appointments at Simon Fraser University and York University and has been a visiting professor at the University of California, University of British Columbia, Stockholm School of Economics, Copenhagen School of Business, and the Helsinki School of Economics. He has published more than 150 articles and monographs and is the author of the book *The Impacts of 9/11 on Canada-U.S. Trade* as well as a textbook on international business management. In the early 1990s, he was responsible for coordinating Fraser Institute research on the North American Free Trade Agreement. He earned his BA in economics from Brooklyn College, his MA from the University of California, Los Angeles, and his PhD from New York University.



### Joel Emes

Joel Emes is President of Abacus Economics and a Fraser Institute Senior Fellow who rejoined the Institute after a stint as a senior advisor to British Columbia's provincial government. He previously served as a senior analyst, then as acting executive director, at the BC Progress Board. Prior to that, Joel was a senior research economist at the Fraser Institute where he initiated and led several flagship projects in the areas of tax freedom and government performance, spending, debt, and unfunded liabilities. Joel holds a B.A. and an M.A. in economics from Simon Fraser University.

## Acknowledgments

The authors wish to thank the Lotte and John Hecht Memorial Foundation and the Barbara and Bob Mitchell Fund for generously supporting this project. They also thank an anonymous reviewer for very helpful comments on an earlier draft. Any errors and omissions are the sole responsibility of the authors. As the researchers worked independently, the views and conclusions expressed in this paper do not necessarily reflect those of the Board of Directors of the Fraser Institute, the staff, or supporters.

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### ISBN

978-0-88975-557-4

### Date of issue

July 2019

### Citation

Globerman, Steven, and Joel Emes (2019). *Private Sector Capital Expenditures in Canada: An Industry-Level Analysis*. Fraser Institute. <http://www.fraserinstitute.org>.

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