



The Conference Board
of Canada

Le Conference Board
du Canada

CUSTOM REPORT

The Economic Footprint of Canada's Produce Sector: An Update

October 2017

Presented to:
Canadian Produce Marketing Association

Prepared by:
The Conference Board of Canada

Preface

In 2014, the Conference Board of Canada produced a comprehensive report on the economic footprint that fresh produce has on the Canadian economy. Output in the produce sector satisfies two main activities in the economy: consumption and exports. At that time, the total value of produce consumption in Canada was equivalent to \$10.1 billion, while an additional \$4 billion in produce was exported to international markets. In turn, we estimated that the Canadian produce sector directly supported 76,700 jobs and \$4.8 billion (2007 dollars) in direct real gross domestic product (GDP).

However, when we included the supply-chain and induced impacts associated with consumption and export of fruits and vegetables, the footprint the sector has on the economy was considerably larger. After accounting for these secondary and tertiary impacts, we found that the total footprint the industry made climbed to \$11.4 billion in real GDP and 147,900 jobs in 2013. Furthermore, when taking into account the increase in household income and corporate profits attributable the sector, we estimated that provincial and federal governments benefited from an additional \$3.7 billion in budgetary revenues thanks to the produce sector.

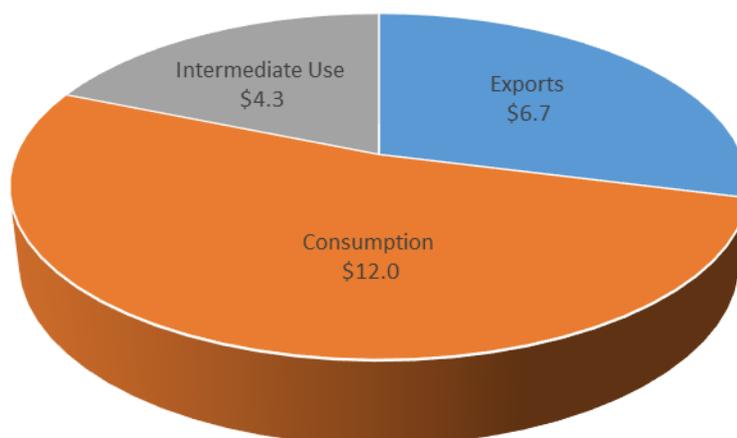
The purpose of this report is to update these previous estimates, taking into account the industry's newest production figures from 2016.

Direct Impact

The methodology used to calculate the produce sector's current footprint is the same as the one used in the 2014 study, in that it evaluates the economic impact tied to the consumption and export of produce in Canada. Based on information collected from Statistics Canada, we estimate that total household consumption of fresh produce¹ reached \$12 billion in 2016. (See Chart 1). Furthermore, there was an additional \$4.3 billion worth of fresh produce that was consumed by industries in Canada as an intermediate input into their own production process. For example, restaurants and food manufacturers use significant amounts of fresh produce to support their own operations, and while this intermediate consumption of produce does not directly impact the economy, it nonetheless partially supports economic activity that would not exist without produce. As a result, we include this intermediate consumption in our analysis.²

Chart 1: Direct Output

(direct output, by type of activity - \$ billions, 2016)



Sources: The Conference Board of Canada, Statistics Canada.

Based on these estimates, total household and intermediate consumption was \$16.3 billion in 2016. There was also an additional \$6.7 billion worth of produce that was exported. Thus, the purpose of this analysis is to quantify the direct, indirect, and induced economic benefits that are sustained in the Canadian economy as a result of \$23 billion in domestic sales, distributed across the activities as outlined in Chart 1. In terms of value, fresh vegetables make up 53 per cent of the produce sector's

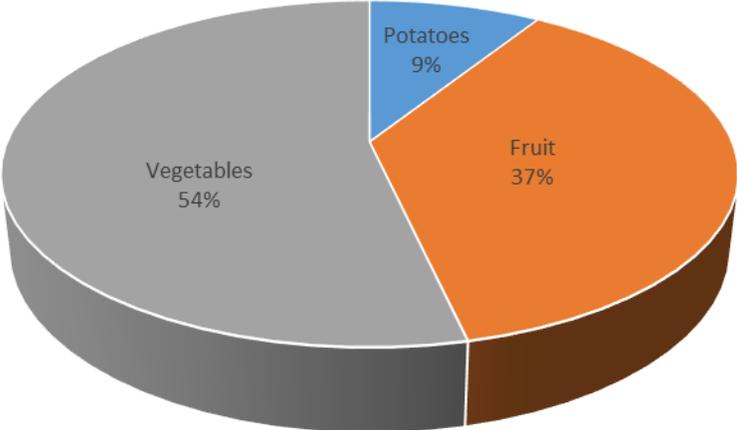
¹ For the purposes of this analysis, fresh produce is defined as the sum of the following commodities from Statistics Canada's Input-Output Commodity Codes list: fresh potatoes (MPG111A05), fresh fruits and nuts (MPG111A06), and fresh vegetables (MPG111A08). More information on this system can be found on Statistics Canada's website here: https://www.statcan.gc.ca/eng/nea/classification/io_com/cat

² Although the individual economic impacts tied to household and intermediate use differ, for simplicity, we refer to their combined impact as "consumption" in this report, as was done in the 2014 analysis. Information on their individual footprints of the different economic uses of fresh produce can be found in the Appendix.

output, followed by fresh fruit which accounts for 37 per cent, with sales of potatoes accounting for the remaining 9 per cent. (See Chart 2).

Chart 2: Vegetables Account for Majority of the Produce Sector’s Output

(share of total final and intermediate demand, by commodity – per cent, 2016)



Sources: The Conference Board of Canada; Statistics Canada.

To estimate the economic footprint associated with these activities, this information was reorganized using Statistics Canada’s input-output tables into an estimate of direct value-added for the industry.³ Based on this analysis, we estimate that \$6.9 billion worth of GDP was directly sustained by produce in Canada in current dollars. After adjusting for inflation, this amounts to \$6.1 billion in 2007 dollars⁴ which is 27 per cent greater than the direct impact the industry had in 2013.

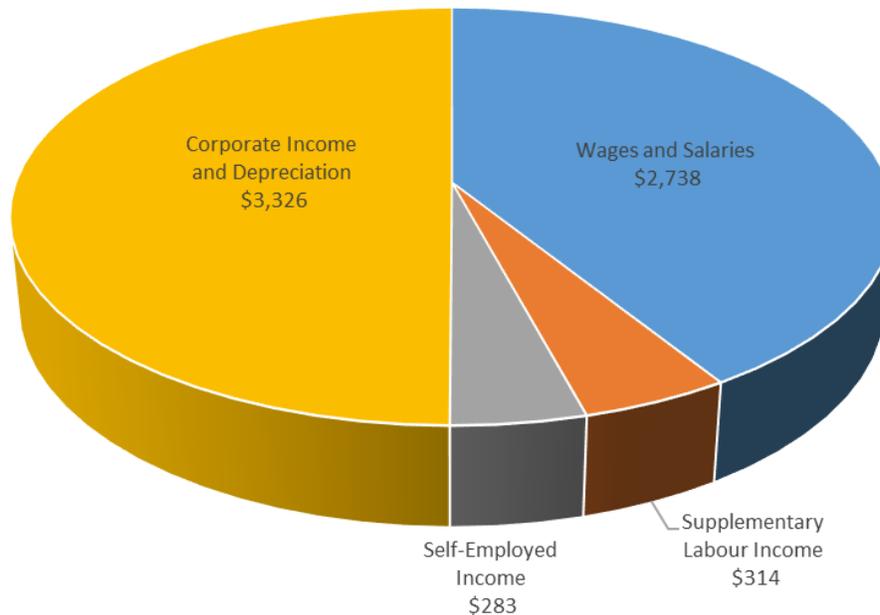
The direct impact that the produce sector has on the economy can also be assessed in terms of the income it sustains. Our estimates suggest that the \$6.9 billion in nominal GDP supported by the industry in 2016 was split equally between workers and firms. A total of \$3.1 billion in labour income was paid to employees, including employer’s social contributions and other supplementary labour income, while another \$283 million was income related to self-employment in the sector. The remaining \$3.3 billion in income accrued to firms in the form of pre-tax corporate profits or depreciation. Detailed information on the distribution of income sustained by the direct impact is presented in Chart 3.

³ Value-added is the most intuitive concept of gross domestic product. Within an industry, it is calculated as the difference between total revenue and the sum of expenses on intermediate parts, materials, and services used in the production process.

⁴ For the remainder of this analysis, all GDP estimates are quoted in 2007 constant dollars to remain consistent with the 2014 analysis. All other estimates are presented in current dollars for 2016, unless otherwise noted.

Chart 3: Direct GDP by Income Type

(direct income sustained by the produce sector in 2016 - \$ millions)



Sources: The Conference Board of Canada; Statistics Canada.

The direct impact that the industry has can also be expressed in terms of employment. In total, we estimate that the industry directly supports a total of 91,083 jobs in the Canadian economy, which is 18.8 per cent higher than the produce sector's direct contribution to the work force in 2013. The jobs supported by the industry directly are concentrated overwhelmingly in just four industries, which in order of their direct employment are: retail trade, crop production, wholesale trade, and transportation and warehousing. (See Chart 4). The reason that the direct employment impact has increased by less than the direct impact on GDP since the 2014 analysis is due to productivity improvements over that time. Weighted by their direct employment shares, labour productivity in the sector has improved by 8.4 since 2013 which means that fewer workers are required to support the same level of output. Notably, the produce sector has performed considerably better than the Canadian aggregate in this regard. Total output per worker economy-wide has increased just 2.6 per cent over the same period.

About 12.5 per cent of these jobs are considered self-employed, which is a relatively high share compared to most industries and due to the high number of self-employed agricultural workers – about 44 per cent of the direct jobs in agriculture are estimated to be self-employed. In aggregate then, the direct impact the industry makes on the Canadian economy amounts to 91,083 workers that produced \$6.1 billion worth of real GDP in 2016, distributed across the industries that are outlined in Chart 4. This direct impact amounts to 0.7 and 0.4 per cent of private-sector employment and real GDP, respectively in 2016.

Chart 4 – Direct Impact by Industry

(total employment - left scale; GDP in 2007 dollars, millions – right scale)



Source: The Conference Board of Canada, Statistics Canada.

Supply-Chain

The direct impact is confined to four main industries that reflect how fresh produce is sourced and used in the Canadian economy. When Canadians consume produce, it is either produced domestically by Canadian farmers or imported from other countries. Regardless, food and beverage wholesalers will either aggregate domestic production across firms, or source the produce from another country on a large scale, before passing the products on to the retail sector where it is marketed to the consumer.

Similarly, when produce is exported, Canadian farmers grow and harvest these products, wholesalers aggregate for international buyers, and the goods are transported to the border en-route to their final destination.

And although the direct impact that these activities have on the economy is substantial, the overall footprint of the produce sector is much larger when we consider the supply-chain benefits that are linked to these directly impacted firms. In essence, the supply-chain (or indirect) impacts measure the value-added and employment that the directly impacted firms generate through their demand for intermediate inputs or support services that go into the production and export of fruits and vegetables. We estimate that this supply-chain impact sustains another 61,449 jobs in the Canadian economy and \$5.2 billion in real GDP. The distribution of these impacts is broad and reflects the wide variety of goods and services required to bring fresh produce to market. (See Table 1).

A good illustration of the supply-chain effect is the wholesaling and retailing activity tied to the produce sector. Food and beverage wholesalers factor prominently into the direct impact by aggregating domestic production and finding international companies to satisfy the import and export requirements that balance supply and demand. But machinery and equipment wholesalers indirectly support this

activity by providing the necessary equipment to produce fruits and vegetables on the farm. In the same way, food retailers (grocery stores) are also a key part of the direct impact as they represent the primary means of marketing produce to consumers. But other retail industries, like building materials and garden supplies, or motor vehicles and parts, are important components of the industry's indirect impact. They provide many of the required inputs to sustain the production process of the firms that are directly involved in bringing produce from the farm, or from the border, to the retail store and eventually to the consumer. In total, 20,607 jobs are supported indirectly in wholesale or retail trade across Canada due to the fresh produce sector, which is equivalent to one-third of the overall indirect employment effect. These jobs are in addition to those categorized into the direct impact above, and help to explain why activities like wholesale and retail are prominently featured in different stages of the produce sector's footprint.

Table 1: Supply-Chain Impact of the Canadian Produce Sector

Employment		%	GDP (millions, \$2007)		%
Retail trade	14,639	23.8	Crop production	778	14.8
Wholesale trade	5,968	9.7	Financial services and real estate	767	14.6
Crop production	5,850	9.5	Retail trade	523	10.0
Financial services and real estate	5,423	8.8	Manufacturing	517	9.9
Professional services	5,255	8.6	Wholesale trade	474	9.0
Transportation and warehousing	5,240	8.5	Transportation and warehousing	432	8.2
Administrative services and waste management	5,036	8.2	Professional services	390	7.4
Manufacturing	3,680	6.0	Mining, oil, and gas	346	6.6
Repair construction	2,060	3.4	Administrative services and waste management	224	4.3
Accommodation and food	1,488	2.4	Utilities	200	3.8
Other	6,808	11.1	Other	595	11.3
Total	61,449	100	Total	5,246	100

Source: The Conference Board of Canada.

The transportation sector is another good example of this dynamic. Directly, the transportation sector provides the service which brings produce from the farm to the final user, domestic or otherwise, and this sustains an estimated 2,400 jobs as shown in the previous section. But another 5,240 transportation jobs are indirectly supported by the shipment of the non-produce goods that are required to sustain the operations of the directly impacted firms. Things like transporting fertilizer to the farm gate, or shipping spare parts to trucking companies, and even moving key energy inputs like oil and natural gas by pipeline, are all examples of indirect transportation activity that would not occur were it not for the demand created by the directly impacted firms.

Another area where the produce sector makes a large indirect impact on the Canadian economy is in the financial services and real estate industries. Produce sector firms, like any other, require banking, insurance, and land to conduct their operations. Thus, through the course of their operations, they indirectly support employment and value-added in these industries. In total, there are more than 5,400 financial service or real estate jobs tied to the produce sector through the supply-chain. The highest numbers of these are in banking which benefits from 1,566 jobs, followed by 1,200 at insurance agencies or carriers, and 473 at real estate firms.

In total, about 50 per cent of the total indirect employment effects occur in wholesale, retail, transportation or financial services and real estate. But produce firms also indirectly support employment and economic activity in legal and accounting services, administrative and employment

services, repair construction activity, chemicals and machinery manufacturers, oil and natural gas firms, postal services, computer and telecommunications services, and many other industries across the country. In total, no fewer than 7 of the major industries in Canada indirectly benefit from at least 5,000 jobs, while another 6 secure at least 1,000 thanks to the fresh produce sector.

Similar to the disaggregation of the direct impact, the value-added sustained in the supply-chain can also be expressed by the distribution of income that it creates. Primary household income in 2016 was lifted by \$3.1 billion due to this supply-chain effect, which included \$2.5 billion in wages and salaries paid directly to employees, and another \$342 million in employers' social contributions on their behalf. This figure also accounts for \$242 million in self-employed income. The remaining \$2.6 billion is income that accrues to firms' balances sheets in the form of pre-tax corporate profits or depreciation.

Including the supply-chain impact with the produce sector's direct impact lifts the aggregate footprint to \$11.4 billion in real GDP, and 152,532 jobs in the Canadian economy. Thus, for every \$100 in real GDP directly supported by the industry, another \$86 is sustained in the supply-chain. And for every 100 jobs directly involved in producing or exporting produce, another 67 are sustained indirectly in other industries.

Income Effect

The final component of the industry's footprint results from the induced, or income, effect. These are impacts that measure the economic gain that results when wages of the directly, or indirectly, employed workers are spent into the economy. Generally, these impacts are smaller than those in the supply-chain, and more broadly based as they tend to mirror the impacts that result when consumers spend their incomes. This income-related impact is estimated to sustain an additional \$2.6 billion in real GDP and 29,035 jobs spread across different industries.

Table 2 shows how the impacts on an industry-by-industry basis vary depending on whether we express them in terms of GDP, or by employment. For example, the biggest impact in terms of employment is in retail trade where 6,770 jobs are sustained by the produce sector's income effect – equivalent to 23 per cent of the total induced employment supported. After retail, the largest employment impacts are found in accommodations and food services (3,821) and financial services and real estate (3,450). In terms of GDP however, the highest share of the impact goes towards imputed rent on consumer-owned dwellings which accounts for 20 per cent of the total, followed by financial services and real estate (19 per cent), retail trade (10 per cent), and manufacturing (7 per cent). The different distribution of effects for GDP and employment reflects the differences in average wages across the different industries. For example, \$100 spent by consumers on financial services in Canada sustains fewer jobs than does \$100 spent at restaurants due to the wide discrepancy in income per worker between the two industries.

Table 2: Induced Impact of the Canadian Produce Sector

Employment		%	GDP (millions, \$2007)		%
Retail trade	6,770	23.3	Imputed rent on consumers' dwellings	515	20.0
Accommodation and food services	3,821	13.2	Financial services and real estate	486	18.9
Financial services and real estate	3,450	11.9	Retail trade	250	9.7
Administrative services and waste management	1,683	5.8	Manufacturing	169	6.6
Wholesale trade	1,587	5.5	Wholesale trade	125	4.9
Health care and social assistance	1,445	5.0	Information and cultural industries	120	4.7
Professional services	1,337	4.6	Transportation and warehousing	103	4.0
Transportation and warehousing	1,254	4.3	Accommodation and food services	103	4.0
Manufacturing	1,240	4.3	Professional services	99	3.9
Arts, entertainment and recreation	974	3.4	Utilities	79	3.1
Other	5,476	18.9	Other	522	20.3
Total	29,035	100	Total	2,570	100

Source: The Conference Board of Canada.

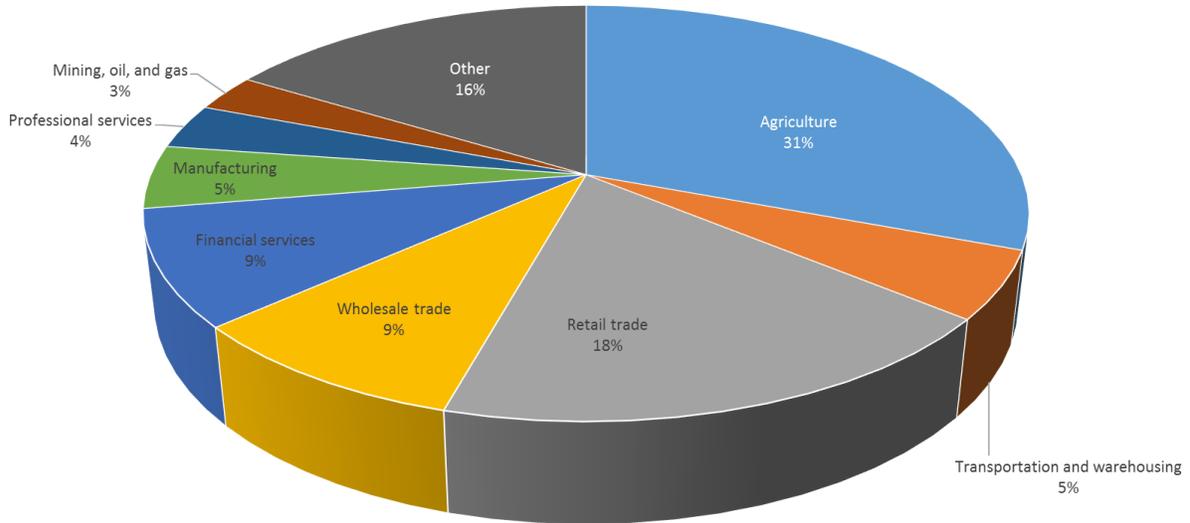
As with the direct and supply-chain effects of the produce sector's footprint, this income effect can also be disaggregated by the share of income that accrues to labour and the share that goes to firms. Slightly less than \$1.4 billion in labour income is created by the income effect, which includes \$1.1 billion in wages and salaries and \$158 million in supplementary labour income. Another \$81 million is income tied to self-employment, while the remaining \$1.3 billion is the net corporate income and depreciation expense of firms.

Total Footprint and Fiscal Impact

The total impact that the produce sector makes on the Canadian economy is the sum of the direct, indirect, and induced impacts outlined above. When accounting for the economic ripple effects sustained by the supply-chain and income effects, the produce sector's aggregate footprint rises to \$13.9 billion in real GDP and 181,566 jobs in 2016. Compared to the 2014 analysis, the total footprint in terms of real GDP has increased by 22.2 per cent, while the total employment supported by the sector has increased 22.8 per cent. This is in line with the higher consumption and export levels for the three main commodities in this report as outlined above, but also accounts for changes to the industry's supply-chain, higher wage rates and productivity, and shifts in relative input costs.

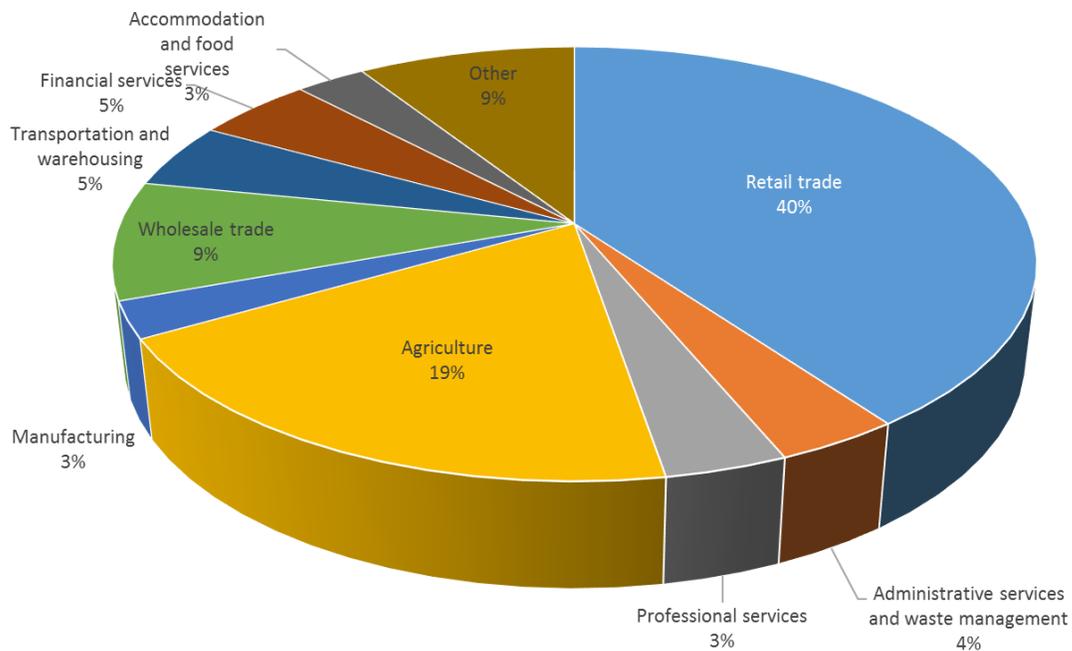
The total economic activity, and the resulting employment, that the produce sector supports through its direct, indirect, and induced impact accounts for 1 per cent of private-sector real GDP in Canada and 1.3 per cent of private-sector employment. The distribution of the aggregate impact on real GDP is shown in Chart 5, while the distribution of employment effects is presented in Chart 6. More detailed tables on the industry's impact, by type of activity, and by industry can be found in the Appendix to this report.

Chart 5: Aggregate Footprint of Canadian Produce
 (sum of the direct, indirect, and induced GDP impacts, by industry – per cent)



Sources: The Conference Board of Canada; Statistics Canada.

Chart 6: Employment Footprint of Canadian Produce
 (sum of the direct, indirect, and induced employment impacts, by industry – per cent)



The economic footprint that the produce sector makes on the economy also results in a quantifiable lift to budgetary revenues which accrue either to the Federal government, or the different provincial governments across the country. For example, based on the GDP and employment impacts outlined above, we estimate that the produce sector generated a total of \$7.8 billion in labour income in 2016. Slightly less than 82 per cent of this was paid directly in wages and salaries to employees, another 10 per cent was supplementary labour income payments, while the remainder was self-employed income. We estimate that this household income supported \$1.8 billion in personal income tax collections, of which 59 per cent went to the Federal government while the remainder was collected provincially across Canada. There is also another \$888 million in indirect taxes that was supported by the lift to consumer spending that results from the income effect. Roughly \$308 million of these indirect taxes are federal or provincial sales taxes (i.e. HST or GST receipts).

The remaining \$7.3 billion in income accrues to firms, with about \$3.5 billion estimated as pre-tax corporate profits, while the remainder is depreciation of firms' assets. This sustained \$1.1 billion in corporate income tax receipts, and there was also an additional \$218 million in miscellaneous tax collection by governments thanks to the produce sector. All in all, the industry supported just shy of \$4 billion in budgetary revenues to federal and provincial governments across the country in 2016. These fiscal benefits are outlined in detail in Table 3.

Table 3: Fiscal Impacts of the Canadian Produce Sector

(budgetary revenues, \$ millions – 2016)

	Federal	Provincial	Total
Personal income tax	1,054	731	1,785
Corporate income tax	649	411	1,059
Indirect taxes	235	653	888
<i>of which: Sales tax</i>	<i>119</i>	<i>189</i>	308
Other taxes	142	77	218
Total	2,079	1,871	3,950

Source: The Conference Board of Canada.

Aggregate information on the produce sector's footprint is presented in Table 4, along with a list of selected metrics that help to provide context for the industry's footprint. In total, the industry supported 181,566 jobs and more than \$13.9 billion in real GDP in 2016. This lift to economic activity also generated \$4 billion worth of budgetary revenues that accrued to the federal or provincial governments in Canada.

The multipliers and ratios presented in Table 4 provide useful ways of describing the aggregate impact that produce makes on the Canadian economy. For example, for every \$100 in direct GDP created by produce-related activity in 2016, a total of \$227 in value-added is sustained across the entire economy. Similarly, for every job directly involved in the production and export of produce, there is roughly 2 jobs supported in total. The industry's footprint sustains \$68.25 in value-added for every \$100 in revenues, and makes up 1.3 per cent of private-sector employment, and 1 per cent of private-sector real GDP. In aggregate, the \$4 billion in budgetary revenues collected represent 0.6 per cent of all revenues collected

by provincial and federal governments in Canada – 0.7 per cent of federal revenues, and 0.4 per cent of provincial revenues.

Table 4: Summary

(Footprint of Canadian produce sector – selected indicators, 2016)

Total GDP (\$2007, millions)	13,927	Multipliers	
- direct	6,112	GDP multiplier (total GDP / direct GDP)	2.27
- indirect	5,246	Employment multiplier (total jobs / direct jobs)	1.99
- induced	2,570	Value-added per \$100 in output	\$68.25
Total employment	181,566	Jobs per \$1 million in output	7.9
- direct	91,083	Share of private-sector GDP (per cent)	1.0
- indirect	61,449	Share of private-sector employment (per cent)	1.3
- induced	29,035	Federal tax collections as a share of total (per cent)	0.75
Labour income (millions)	7,761	Provincial tax collections as a share of total (per cent)	0.44
- direct	3,335		
- indirect	3,064		
- induced	1,362		

Appendix

Table 5: Distribution of GDP and Employment Impacts – Total
(sum of direct, indirect, and induced effects, by industry)

Employment			GDP (millions, \$2007)		
		%			%
Retail trade	72,694	40.0	Agriculture	4,280	30.7
Agriculture	35,042	19.3	Retail trade	2,555	18.3
Wholesale trade	15,998	8.8	Wholesale trade	1,262	9.1
Transportation and warehousing	8,894	4.9	Financial services and real estate	1,253	9.0
Financial services and real estate	8,873	4.9	Transportation and warehousing	731	5.2
Administrative services and waste management	6,719	3.7	Manufacturing	685	4.9
Professional services	6,592	3.6	Professional services	489	3.5
Accommodations and food services	5,309	2.9	Mining, oil, and gas	401	2.9
Manufacturing	4,920	2.7	Administrative services and waste management	299	2.1
Repair construction	2,715	1.5	Utilities	279	2.0
Information and cultural industries	2,058	1.1	Information and cultural industries	268	1.9
Other	11,752	6.5	Other	1,425	10.2
Total	181,567	100	Total	13,927	100

Table 6: Distribution of GDP and Employment Impacts – Consumption of Produce
(sum of direct, indirect, and induced effects, by industry)

Employment			GDP (millions, \$2007)		
		%			%
Retail trade	56,391	57.0	Retail trade	1,960	31.5
Wholesale trade	8,349	8.4	Agriculture	904	14.5
Crop and animal production	6,271	6.3	Financial services and real estate	662	10.6
Financial services and real estate	4,501	4.5	Wholesale trade	643	10.3
Transportation and warehousing	4,431	4.5	Transportation and warehousing	354	5.7
Administrative services and waste management	3,464	3.5	Manufacturing	243	3.9
Professional services	3,272	3.3	Professional services	237	3.8
Accommodation and food services	2,799	2.8	Administrative services and waste management	158	2.5
Manufacturing	1,899	1.9	Mining, oil, and gas	139	2.2
Repair construction	1,191	1.2	Information and cultural industries	138	2.2
Information and cultural industries	1,106	1.1	Utilities	107	1.7
Other	5,304	5.4	Other	688	11.0
Total	98,978	100	Total	6,230	100

Table 7: Distribution of GDP and Employment Impacts – Export of Produce
(sum of direct, indirect, and induced effects, by industry)

Employment			GDP (millions, \$2007)		
		%			%
Agriculture	25,100	45.1	Agriculture	2,860	50.0
Wholesale trade	5,128	9.2	Wholesale trade	422	7.4
Retail trade	3,749	6.7	Financial services and real estate	405	7.1
Transportation and warehousing	3,291	5.9	Manufacturing	352	6.1
Financial services and real estate	3,071	5.5	Transportation and warehousing	281	4.9
Manufacturing	2,363	4.2	Mining, oil, and gas	209	3.7
Professional services	2,360	4.2	Professional services	182	3.2
Administrative services and waste management	2,258	4.1	Retail trade	157	2.7
Accommodation and food services	1,729	3.1	Utilities	136	2.4
Repair construction	1,148	2.1	Administrative services and waste management	97	1.7
Information and cultural industries	645	1.2	Information and cultural industries	91	1.6
Other	4,797	8.6	Other	534	9.3
Total	55,640	100	Total	5,726	100

Table 8: Distribution of GDP and Employment Impacts – Intermediate Use of Produce
(sum of direct, indirect, and induced effects, by industry)

Employment			GDP (millions, \$2007)		
		%			%
Retail trade	12,554	46.6	Agriculture	516	26.2
Crop and animal production	3,671	13.6	Retail trade	439	22.3
Wholesale trade	2,521	9.4	Wholesale trade	197	10.0
Finance, insurance, real estate, rental and leasing	1,300	4.8	Financial services and real estate	186	9.4
Transportation and warehousing	1,173	4.4	Transportation and warehousing	96	4.9
Administrative and support, waste management and information services	997	3.7	Manufacturing	91	4.6
Professional, scientific and technical services	960	3.6	Professional services	70	3.6
Accommodation and food services	781	2.9	Mining, oil, and gas	53	2.7
Manufacturing	658	2.4	Administrative services and waste management	45	2.3
Repair construction	375	1.4	Information and cultural industries	39	2.0
Information and cultural industries	308	1.1	Utilities	36	1.8
Other	1,651	6.1	Other	204	10.3
Total	26,949	100	Total	1,971	100