

Latest Developments in the Canadian Economic Accounts

The 2014 to 2016 revisions of the Income and Expenditure Accounts



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The 2014 to 2016 revisions of the Income and Expenditure Accounts

Introduction

This article describes the revisions to the Gross Domestic Product (GDP) by Income and by Expenditure Accounts for the period from 2014 to 2016. These data follow the November 2017 release of the 2016 Provincial and Territorial Economic Accounts estimates, which include revisions to the 2014 and 2015 period.

The first two quarters of 2017 were also revised. However, since these estimates will continue to be revised during upcoming cycles, in accordance with our standard revision practice, they are not included in the analysis presented in this article.

Revision process

The estimates of the GDP by Income and by Expenditure Accounts are subject to three types of revisions. The first type involves incorporating the latest benchmark from the supply and use tables. The second type involves incorporating data from the latest annual surveys and administrative data. The third type of revision, which is performed less frequently, refers to the incorporation of new concepts, methods, accounting standards and classification systems.

The 2014 to 2016 revisions to the GDP by Income and by Expenditure Accounts include only the first two types of revisions. In general, these two types of revisions, which are statistical in nature, are carried out annually and impact only the last three years of the time series.

The statistical revisions to GDP reflect the incorporation of the most current data sources, including survey results, administrative data, public accounts and the annual supply and use tables. These tables incorporate the highest-quality data sources available to Statistics Canada in a rigorous, detailed accounting framework. Consequently, they represent the most detailed, coherent accounting system for the structure of the Canadian economy and are considered the most accurate benchmarks on which to base estimates. In this release, new benchmark values from the supply and use tables for the 2014 reference year have been incorporated into the GDP by Income and by Expenditure Accounts. New benchmark information (from annual surveys and administrative data) is also included for the last two years (2015 and 2016).

This article briefly describes and explains the impact of the 2014 to 2016 revisions on annual and quarterly GDP, on both a nominal and a real basis. It also examines the revisions to the various components of GDP by income and by expenditure.

Revisions to the growth of nominal GDP

The revision to the annual growth rate of nominal GDP increased the rate by 0.4 percentage points in 2014 and was unchanged in 2015. The growth rate in 2016 decreased by 0.1 percentage points as a result of the revision process. The revisions to 2014 were due to the incorporation of new benchmark data from the 2014 supply and use tables. Revisions to income based GDP in 2014 and 2015 resulted from increases to gross operating surplus, gross mixed income and taxes less subsidies on products and imports. Expenditure based 2014 revisions resulted from higher gross fixed capital formation and exports of goods and services. These were moderated slightly by lower household and government final consumption expenditure. Expenditure based 2015 revisions resulted from increases in household final consumption expenditure, gross fixed capital formation and business investment in inventories, which were moderated by increases to imports of services. In 2016, nominal GDP actually increased, but less than the increase in 2015, resulting in a decline in the annual growth rate. Sources of revisions were higher gross operating surplus and taxes less subsidised on products and imports, yet notable declines in compensation of employees almost entirely offset these increase.

For the period 2014 to 2016, the mean absolute percentage point revision to the annual growth rate of nominal GDP was 0.1 percentage points (see Table 1).

Table 1
Revisions to the growth of nominal GDP, annual

	Previously-published average growth of annual GDP	Revised average growth of annual GDP	Mean absolute revision to the growth of annual GDP
	percentage		percentage points
2014 to 2016	2.25	2.38	0.13
2014	4.51	4.88	0.37
2015	0.16	0.24	0.08
2016	2.08	2.03	0.05

Source: Statistics Canada, "The 2014 to 2016 revisions of the Income and Expenditure Accounts", *Latest Developments in the Canadian Economic Accounts* (13-605-X), 2017.

On a quarterly basis, the revisions to the growth rates of nominal GDP resulted in little change relative to the previous estimates. The magnitude of the revisions for the 12 quarters covered by the revision period ranged between an upward revision of 0.2 percentage points to a downward revision of 0.2 percentage points. These revisions are consistent with historical averages. Overall, there were upward revisions for six quarters, downward revisions for five quarters, and no changes for one quarter. Over the revision period, the quarterly trend remained similar to the trend based on the previously published estimates.

Table 2
Revisions to the growth of nominal GDP, quarterly

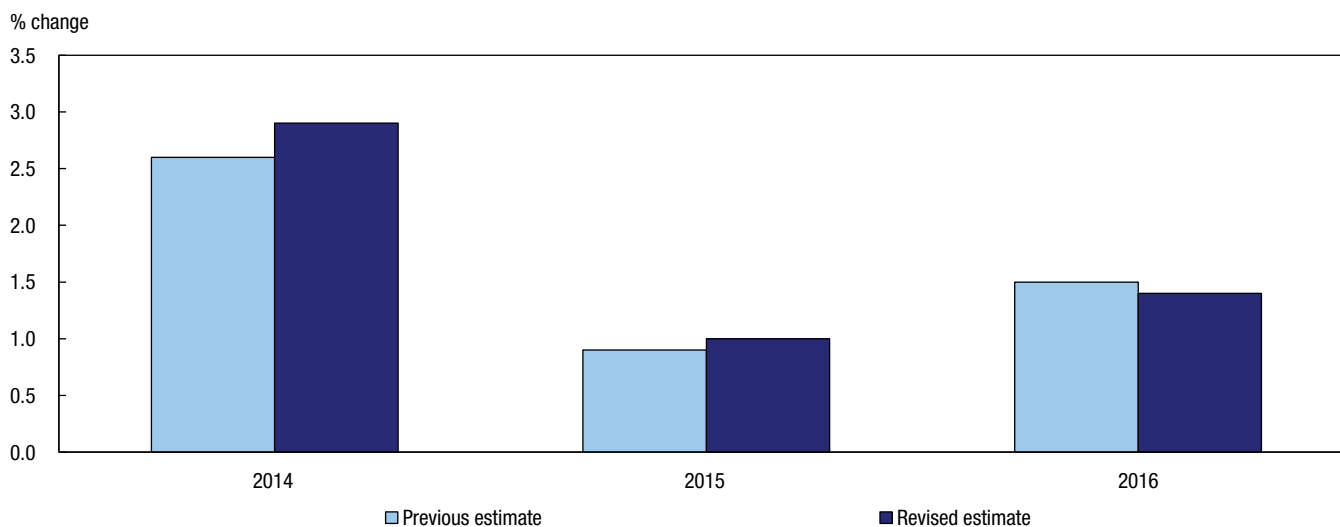
	Previously-published average growth of quarterly GDP	Revised average growth of quarterly GDP	Mean absolute revision to the growth in quarterly GDP
	percentage		percentage points
2014 to 2016	0.60	0.64	0.04
2014	0.92	1.04	0.12
2015	-0.10	-0.11	0.01
2016	0.98	0.98	0.00

Source: Statistics Canada, "The 2014 to 2016 revisions of the Income and Expenditure Accounts", *Latest Developments in the Canadian Economic Accounts* (13-605-X), 2017.

Revisions to the growth of real GDP

The annual growth rate of real GDP was revised upward by 0.3 percentage points for 2014, by 0.1 percentage points in 2015 and revised down by 0.1 percentage points in 2016 as a result of the increases to 2015 surpassing the increases in 2016 resulting in an annual growth rate decline.

Chart 1
Revisions to real gross domestic product by year, chained (2007) dollars



Source: Statistics Canada, "The 2014 to 2016 revisions of the Income and Expenditure Accounts", *Latest Developments in the Canadian Economic Accounts* (13-605-X), 2017.

The mean absolute percentage point revision to the annual growth rate in real GDP for the 2014 to 2016 revision period was 0.1 (see Table 3).

Table 3
Revisions to the growth of real GDP, annual

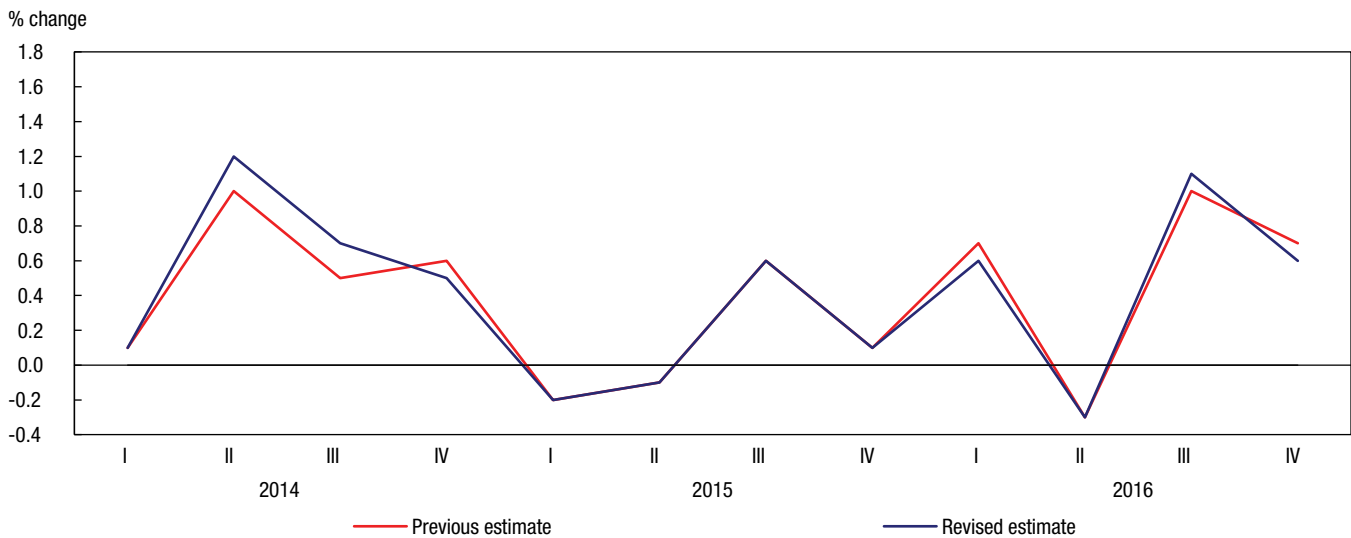
	Previously-published average growth of annual real GDP	Revised average growth of annual real GDP	Mean absolute revision to the growth in annual real GDP
	percentage	percentage	percentage points
2014 to 2016	1.66	1.76	0.10
2014	2.57	2.86	0.29
2015	0.94	1.00	0.06
2016	1.47	1.41	0.06

Source: Statistics Canada, "The 2014 to 2016 revisions of the Income and Expenditure Accounts", *Latest Developments in the Canadian Economic Accounts (13-605-X)*, 2017.

The aggregated chained price indexes were revised up by 0.1 percentage points for all years with moderate shifts at the component level for each year.

On a quarterly basis, the movement of real GDP between 2014 and 2016 was slightly different from the previously published estimates (see Chart 2).

Chart 2
Revisions to real gross domestic product by quarter, chained (2007) dollars



Source: Statistics Canada, "The 2014 to 2016 revisions of the Income and Expenditure Accounts", *Latest Developments in the Canadian Economic Accounts (13-605-X)*, 2017.

The quarterly growth rates of real GDP for 2014 were higher than the previous estimates, as the rate was revised upward by 0.2 percentage points for the second quarter and third quarter and revised down by 0.1 percentage points in the fourth quarter.

For 2015, the estimates on a quarterly basis remained unchanged.

For 2016, real GDP growth for the first and fourth quarters were revised down 0.1 percentage points, while the third quarter was revised up by 0.1 percentage points.

Overall, the mean absolute percentage point revision to the quarterly growth rate in real GDP for the revision period was less than 0.1.

Table 4
Revisions to the growth of real GDP, quarterly

	Previously-published average growth of quarterly real GDP	Revised average growth of quarterly real GDP	Mean absolute revision to the growth in quarterly real GDP
	percentage		percentage points
2014 to 2016	0.38	0.40	0.02
2014	0.54	0.63	0.09
2015	0.09	0.08	0.01
2016	0.51	0.49	0.02

Source: Statistics Canada, "The 2014 to 2016 revisions of the Income and Expenditure Accounts", *Latest Developments in the Canadian Economic Accounts* (13-605-X), 2017.

Revisions to the level of annual nominal GDP

For the period from 2014 to 2016, the revisions to the GDP by Income and by Expenditure Accounts were mainly attributable to the new supply and use benchmarks for the 2014 reference year and to the incorporation of updated source data in all subsequent years.

These statistical revisions resulted in an upward movement of the GDP level for the revision period. Overall, the level of nominal GDP was revised upward by \$7.1 billion for 2014, by \$8.7 billion for 2015, and by \$8.0 billion for 2016, relative to the previously estimated GDP values.

In each of these three years, revisions were made to various components of GDP. The main contributors were increases in the value of gross operating surplus, mixed income and taxes less subsidies on products and imports on the income side, in addition to declines in compensation of employees in 2016 only. On the expenditure side, the main contributors were gross fixed capital formation and exports of goods and services in 2014, gross fixed capital formation and investment in business inventories in 2015, which was mitigated by lower net trade, and 2016 was influenced by higher gross fixed capital formation, final household consumption expenditure and investment in inventories, which was dampened somewhat by lower net trade. In 2014, the supply and use tables exploited the detailed information contained in the annual business surveys and the final estimates of the Capital Repairs and Expenditure (CAPEX) Survey.

Revisions to the components of the GDP by income account

Table 5 shows the impact of revisions to the components of the GDP by income account.

The main source of revisions for the three years was the revision to the value of gross operating surplus. This value was adjusted upward by \$3.8 billion for 2014, by \$4.1 billion for 2015, and by \$10.5 billion for 2016. The bulk of the upward revisions in this component came from non-financial corporations as estimates of gross operating surplus for financial corporations were revised up slightly. Estimates of gross mixed income were revised up in 2014 and 2015 only. Taxes less subsidies on products and imports were revised up by more than \$2.0 billion in all three years, while taxes less subsidies on production were revised up by \$1.8 billion in 2015 and \$1.5 billion in 2016.

These large revisions were mainly due to the new supply and use system benchmarks in 2014, the incorporation of operating surplus estimates for the financial or non-financial corporations sector based on 2016 tax data and the incorporation of new data from the Canada Revenue Agency.

Table 5
Revisions to income-based GDP components

	Previously-published average level	Revised average level	Average revision
	millions of dollars		
Average 2014 to 2016			
Compensation of employees	1,024,734	1,023,127	-1,607
Gross operating surplus	524,549	530,666	6,117
Gross mixed income	231,338	232,080	741
Taxes less subsidies on production	86,495	87,560	1,065
Taxes less subsidies on products	131,021	133,227	2,205
GDP at market prices	1,998,951	2,006,867	7,915
2014			
Compensation of employees	997,998	998,463	465
Gross operating surplus	553,497	557,281	3,784
Gross mixed income	221,340	222,458	1,118
Taxes less subsidies on production	84,358	84,321	-37
Taxes less subsidies on products	125,003	127,138	2,135
GDP at market prices	1,983,117	1,990,183	7,066
2015			
Compensation of employees	1,025,682	1,026,914	1,232
Gross operating surplus	511,680	515,737	4,057
Gross mixed income	230,907	232,366	1,459
Taxes less subsidies on production	86,079	87,853	1,774
Taxes less subsidies on products	130,752	133,099	2,347
GDP at market prices	1,986,193	1,994,911	8,718
2016			
Compensation of employees	1,050,522	1,044,005	-6,517
Gross operating surplus	508,469	518,979	10,510
Gross mixed income	241,768	241,415	-353
Taxes less subsidies on production	89,048	90,507	1,459
Taxes less subsidies on products	137,309	139,443	2,134
GDP at market prices	2,027,544	2,035,506	7,962

Source: Statistics Canada, "The 2014 to 2016 revisions of the Income and Expenditure Accounts", *Latest Developments in the Canadian Economic Accounts* (13-605-X), 2017.

Revisions to the components of the GDP by expenditure account

Table 6 provides a summary of the revisions to the main components of the GDP by expenditure account. The estimates for household final consumption expenditure were revised up by \$1.3 billion in 2015 for goods components and \$1.5 billion in 2016 for services components.

Government final consumption expenditure was revised lower than previously reported in all three years, -\$1.1 billion, -\$720 million and -\$217 million, respectively. These revisions reflect new data from the new supply and use benchmarks for 2014 and new public accounts data for provincial, territorial and local governments.

Business gross fixed capital formation was revised upward for every year in the 2014 to 2016 period. The revisions for 2014 was +\$6.3 billion, 2015 +\$7.5 billion and 2016, +\$4.9 billion. The main factors in these upward revisions were non-residential structure construction and intellectual property products. Revisions to investments in machinery and equipment were negligible in 2014, but \$1.4 billion lower in 2015 and \$2.4 billion lower in 2016. The revisions reflect final estimates of capital investment data from the supply and use tables. These estimates now incorporate new data from the CAPEX Survey released in May 2017.

The estimates of government gross fixed capital formation were revised upwards in 2014 by \$590 million, downward in 2015 by \$2.3 billion and upwards by \$911 million in 2016.

The revisions to the estimates of business inventories were only significant in 2015 and 2016, increasing by \$1.4 billion (farm) and \$1.7 billion (non-farm) respectively. These revisions reflect new data from the Annual Survey of Manufacturing and Logging Industries, the Annual Wholesale Trade Survey and the Annual Retail Trade Survey.

Exports of goods and services were revised up in 2014 by \$1.4 billion, and in 2015 and 2016 by \$1.7 billion each year. The upward revisions to 2014 were primarily in the exports of goods, while the increases to 2015 and 2016 arose from exports of services as data from the annual release of Canada's International Transactions in Services were incorporated into the GDP by expenditure accounts. These upward revisions were almost entirely due to the revision of exports of commercial services.

Imports of goods and services were revised upward in all three years, but only significantly in 2015 and 2016. Increases to previously produced estimates were \$3.6 billion in 2015 and \$2.8 billion in 2016. As in the case of exports, the revisions to imports of goods were minor, while the revisions to imports of services were significant for 2015 and 2016. They were revised upward by \$2.8 billion for 2015 and \$2.8 billion in 2016.

Table 6
Revisions to expenditure-based GDP components

	Previously-published average level	Revised average level	Average revision
	millions of dollars		
Average 2014 to 2016			
Household final consumption expenditure	1,117,679	1,118,525	846
Government final consumption expenditure	417,638	416,967	-671
Non-profit institutions serving households' final consumption expenditure	27,725	28,284	560
Business gross fixed capital formation	393,280	399,524	6,244
Government gross fixed capital formation	75,983	75,729	-254
Non-profit institutions serving households' gross fixed capital formation	2,797	3,064	266
Inventories	3,258	4,339	1,080
Exports	627,403	628,983	1,580
Imports	665,997	668,341	2,344
Gross domestic product at market prices	1,998,951	2,006,867	7,915
2014			
Household final consumption expenditure	1,083,548	1,083,056	-492
Government final consumption expenditure	405,373	404,297	-1,076
Non-profit institutions serving households' final consumption expenditure	26,769	26,826	57
Business gross fixed capital formation	404,337	410,591	6,254
Government gross fixed capital formation	72,216	72,806	590
Non-profit institutions serving households' gross fixed capital formation	2,821	3,145	324
Inventories	9,248	9,563	315
Exports	626,280	627,641	1,361
Imports	646,555	647,221	666
Gross domestic product at market prices	1,983,117	1,990,183	7,066
2015			
Household final consumption expenditure	1,115,965	1,117,690	1,725
Government final consumption expenditure	417,730	417,011	-719
Non-profit institutions serving households' final consumption expenditure	27,773	28,535	762
Business gross fixed capital formation	390,858	398,389	7,531
Government gross fixed capital formation	76,881	74,618	-2,263
Non-profit institutions serving households' gross fixed capital formation	2,793	2,981	188
Inventories	2,746	3,940	1,194
Exports	627,234	628,955	1,721
Imports	674,694	678,265	3,571
Gross domestic product at market prices	1,986,193	1,994,911	8,718
2016			
Household final consumption expenditure	1,153,523	1,154,829	1,306
Government final consumption expenditure	429,811	429,594	-217
Non-profit institutions serving households' final consumption expenditure	28,632	29,492	860
Business gross fixed capital formation	384,644	389,592	4,948
Government gross fixed capital formation	78,851	79,762	911
Non-profit institutions serving households' gross fixed capital formation	2,778	3,065	287
Inventories	-2,219	-487	1,732
Exports	628,695	630,353	1,658
Imports	676,743	679,538	2,795
Gross domestic product at market prices	2,027,544	2,035,506	7,962

Source: Statistics Canada, "The 2014 to 2016 revisions of the Income and Expenditure Accounts", *Latest Developments in the Canadian Economic Accounts* (13-605-X), 2017.

Improvements to estimates of inter-provincial trade in retail margins

With the November 8, 2017 release of the Provincial and Territorial Economic Accounts, estimates of inter-provincial and international trade were revised back to 1981. The 2014 supply and use benchmarks introduced improved the estimation methods for provincial trade in retail margins to ensure greater coherence with trade in travel services. To preserve time series continuity, impacted estimates were revised back to 1981 in the Provincial and Territorial Economic Accounts. These revisions improve the quality of historical estimates and are in keeping with our current revision policy.

The improved estimation methodology resulted in a reduction to total inter-provincial trade, a revised provincial/territorial distribution of the demand for retail margins, and a change in the share of goods imported internationally. In nominal terms, there is little effect on net trade or provincial/territorial GDP. In real terms, the change in the composition of the aggregated trade components in the chained Fisher calculation resulted in revisions for the entire period, although they were relatively small prior to 2014.

Prior to this improved methodology, the estimated level of inter-provincial exports and imports of retail margins exceeded the estimates of total travel expenditure by Canadians in other provinces or territories. Improvements have been made to increase the coherence between these two indicators since margins are embedded in the cost of purchases and spending by Canadians in other provinces should be closely aligned with the retail margins of their purchases. The share of inter-provincial exports and imports of retail margins has been reduced from 3.5% of total inter-provincial trade to 0.1% of total inter-provincial trade with the release of the 2014 supply and use tables. This proportion has been update back to 1981.

Please note that retail margins represent the difference between the cost of a good purchased for retail and the amount for which the good was sold, less value added taxes. Such margins are traded when, for example, Canadian travellers' purchase goods while in another province or territory, or from on-line stores located in a different province or territory.