

Latest Developments in the Canadian Economic Accounts

Results from the 2015 Comprehensive Revision to the Canadian System of Macroeconomic Accounts



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- . not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- ^P preliminary
- ^r revised
- X suppressed to meet the confidentiality requirements of the *Statistics Act*
- ^E use with caution
- F too unreliable to be published
- * significantly different from reference category ($p < 0.05$)

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Latest Developments in the Canadian Economic Accounts Results from the 2015 Comprehensive Revision to the Canadian System of Macroeconomic Accounts



1. Background

Statistical revisions are carried out regularly in the Canadian System of Macroeconomic Accounts (CSMA), in order to incorporate the most current information from censuses, annual surveys, administrative statistics, public accounts and other sources. Generally, these revisions are limited to the months or quarters within a given reference year, or, on an annual basis, to two to three years to incorporate benchmark information.

Periodically, more comprehensive revisions are conducted. These provide an opportunity to improve estimation methods, incorporate improved data sources, introduce conceptual changes and adopt new international standards into the CSMA. These revisions generally cover a longer time period that is beyond the scope of annual revisions. Comprehensive revisions will be included in releases of the Canadian System of Macroeconomic Accounts starting in November 2015. The revisions are carried back to 1981 for some components, with the majority of revisions made from 2007 onwards.

Over the last number of years, the CSMA has been updated to reflect the latest international recommendations for macroeconomic accounting. These revisions are directly related to changes made to the international standards that are used by Statistics Canada and other national statistical organizations (such as the Bureau of Economic Analysis in the United States) to compile many Key macroeconomic indicators/datasets. This includes the *System of National Accounts 2008* (SNA2008) used to compile the Canadian System of National Accounts, the *Balance of Payments Manual Version 6* (BPM6) and the Foreign Direct Investment used to compile the Canadian International Accounts and the *Government Finance Statistics Manual 2014* used to compile the Canadian Government Finance Statistics.

There are four main sources of revision with this release of the Canadian System of Macroeconomic Accounts: The integration of Government Finance Statistics, the improved treatment of defined benefit pension plans, the measurement of financial services purchased by households', and updated measures of national wealth.

The largest source of the revision is a result of the incorporation of new and improved estimates of Government Finance Statistics. Over the last number of years Statistics Canada has modernized its government finance statistics program. This included adopting the concepts and accounting methods outlined in the International Monetary Fund's (IMF) government accounting manual (the Government Finance Statistics Manual 2014) as well as incorporating improved and more detailed electronic data sources, particularly for provincial, territorial and local general governments. The new accounting concepts and methods and improved data sources have resulted in more accurate measures of government revenue, expenses, operating balances, assets and liabilities.

A second significant source of revision revolves around the treatment of defined benefit pension plans. In the previous version of the Canadian System of Macroeconomic Accounts the contributions to defined benefit pension plans were treated on a cash basis. This meant that the accumulated pension asset reflected the cash contributions plus the investment income of the plan – which may have understated or overstated the true contractual obligation of the defined benefit pension plans. The cash based treatment does not align with international macroeconomic accounting standards which recommend that pension benefits be recorded on an accrual basis. With the 2015 release of the Canadian System of Macroeconomic Accounts all payments to defined benefit pension plans are now treated on an accrual basis, meaning the pension accruals

are recorded as income when the work is performed. This ensures that the compensation of employees aligns with the work performed and the pension asset built up in the household sector reflects the contractual obligations of employers with employees.

Another important revision involves the treatment of financial services purchased by households. New data sources indicate that the level of household purchases of explicit financial services was underreported in the previous version of the Canadian System of Macroeconomic Accounts. These new data show that the previous estimate of explicit financial services purchased by businesses was too high and the estimate of explicit financial services purchased by household was too low. The revision therefore reflects a reallocation from businesses to households which has the effect of increasing gross domestic product. In addition, previous estimates of investment dealer fees paid by households were too low. Improved data on mutual fund assets, incomes and administrative fees resulted in upward revisions.

The fourth revision relates to improvements to various aspects of the measurement of wealth on the National Balance Sheet Accounts:

1. Natural resource wealth has been added to the quarterly National Balance Sheet Account. The addition of this asset improves the overall understanding of the capital used to produce goods and services. In addition to adding to Canada's measure of wealth, this asset has also been apportioned between the government and non-financial corporations' sector. The 'sectoring' of this asset ensures a more accurate measure of the net worth in both the corporate and government sectors.
2. A second revision to wealth involves the incorporation of the latest benchmark estimates from the Survey of Financial Security and Property Assessment files to estimate the value of residential real estate. Previous estimates of the value of residential real estate were derived using the perpetual inventory method where the value of residential real estate is calculated by accumulating (and depreciating) residential investment flows and then using a land to structure ratio to derive the estimate of land. This methodology relies heavily on the new housing price index to calculate the market value of residential real estate. Analysis of the data against other sources indicated that the information from the Survey of Financial Security and the Property Assessment files provides a better measure of the market value of Canadian residential real estate.
3. Finally, revised estimates of services lives for many of Canada's non-residential assets and machinery and equipment were revised. In general these revisions resulted in an upward revision to the consumption fixed capital and a downward revision to the net capital stock of non-residential and machinery and equipment assets.

This paper provides users with a detailed explanation and reconciliation between previously published figures and the new revised figures.

2. Revisions to the level of gross domestic product

Although neither the asset or production boundary (key concepts in macroeconomic accounting determining what ultimately gets included in gross domestic product and national wealth) changed with this comprehensive revision, the average level of GDP was revised upward between 1981 and 2009 and downward between 2010 and 2014. Table 1 shows the change in the level of GDP for the period 1981 to 2014 broken down by revisions due to general government final consumption expenditure, household final consumption expenditure on services and other revisions.

Table 1
Revisions to the level of gross domestic product

Time period	Revised average level of gross domestic product	Previously published average level of gross domestic product	Average revision to the level of gross domestic product	Average revision due to revisions to government final consumption expenditure	Average revision due to revisions to household final consumption expenditure on services	Average revision due to components other than revisions to government final consumption expenditure and household final consumption expenditure on services
millions of dollars						
1981 to 1989	502,412	500,842	1,570	1,380	404	-215
1990 to 1999	817,403	815,015	2,389	930	1,328	131
2000 to 2009	1,371,689	1,365,922	5,766	-73	4,795	1,045
2010 to 2014	1,824,019	1,826,517	-2,498	-9,848	7,649	-298

Average of all years	1,045,080	1,042,633	2,447	-831	3,033	245
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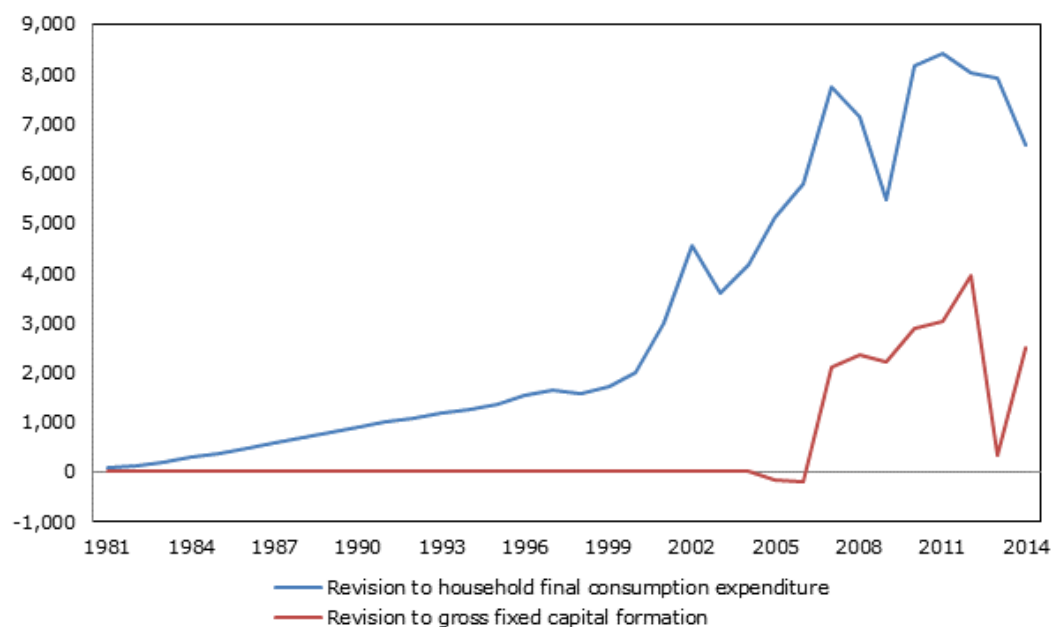
Source: Statistics Canada.

The move by governments to new accrual-based public sector accounting standards and Statistics Canada's adoption of the international Monetary Fund's (IMF) government finance statistics (GFS) concepts, methods and accounting treatment improved the accounting of government revenues, expenses, assets and liabilities within the CSMA. Access to government electronic government accounting records also accompanied these developments. For the most part the improved data sources resulted in downward revisions to general government final consumption expenditure for the period 2007 onwards.

Most of the downward revision to general government final consumption expenditure was offset by an upward revision in household final consumption expenditure on financial services. New source data obtained from administrative data files indicated higher output of the financial services industry related to investment dealer services, starting in the early 2000s. Much of this output was purchased by households. In addition, there was a reallocation of explicit banking services (such as credit card fees and bank account fees) from businesses to households. As a result, household final consumption expenditure on financial services was revised upwards.

Chart 1
Revisions to household final consumption expenditure and gross fixed capital formation

millions of dollars



Source: Statistics Canada.

There were also upward revisions in gross fixed capital formation – specifically investment in residential structures. A review of the methodology used to calculate the value of residential and non-residential structures determined that the value of taxes on production was being underrepresented. In particular, the value of land improvements transferred (or in-kind transfers) by developers to municipalities upon completion of residential subdivisions was being under-estimated. New source data obtained from government accounting records indicate that, on average, land developers' transfer approximately 2.4 billion of in-kind taxes to municipal governments per year. This increased the value of construction investment.

3. Revisions to the growth in GDP

The revisions to the annual and quarterly growth in GDP over the entire revision period were minor. The mean absolute revision to the annual growth in nominal GDP was 0.13 percentage points between 1981 and 2014. Revisions were more substantial in the more recent periods. The mean absolute revision to annual nominal GDP for the period 2010 to 2014 was 0.2 percentage points.

Revisions to the growth in annual real GDP were similar. The mean absolute revision to the annual growth in real GDP was 0.11 percentage points between 1981 and 2014. The largest positive revision was in 2013, where annual real GDP was revised up 0.21 percentage points. The largest downward revision was in 2009, where annual real GDP was revised downward by 0.29 percentage points.

Table 2
Revisions to the growth in annual GDP (real and nominal)

Time period	Revised average growth in annual GDP (percent)	Previously published average growth in annual GDP (percent)	Mean absolute revision to the growth in annual GDP (percentage points)	Revised average growth in annual real GDP (percent)	Previously published average growth in annual real GDP (percent)	Mean absolute revision to the growth in annual real GDP (percentage points)
1982 to 1989	7.80	7.79	0.13	2.88	2.90	0.14
1990 to 1999	4.16	4.16	0.08	2.37	2.38	0.08
2000 to 2009	4.62	4.63	0.14	2.08	2.09	0.10
2010 to 2014	4.72	4.74	0.20	2.53	2.54	0.18
1982 to 2014	5.27	5.27	0.13	2.43	2.44	0.11

Source: Statistics Canada.

Likewise, revisions to quarterly real GDP were minimal. There was no significant revision to the mean absolute revision to real quarterly GDP between 1981 and 2014. The largest positive revision was 0.32 in the first quarter of 1997 and the largest negative revision was 0.27 in the third quarter of 2014.

Table 3
Revisions to growth in quarterly real GDP

Time period	Revised quarterly growth in real GDP (percent)	Previously published growth in real GDP (percent)	Revision (percentage points)	Mean absolute revision in real GDP (percentage points)
1982 to 1989	0.66	0.66	0.00	0.07
1990 to 1999	0.63	0.64	0.00	0.08
2000 to 2009	0.48	0.49	-0.01	0.09
2010 to 2014	0.58	0.57	0.01	0.14
1982 to 2014	0.60	0.60	0.00	0.09

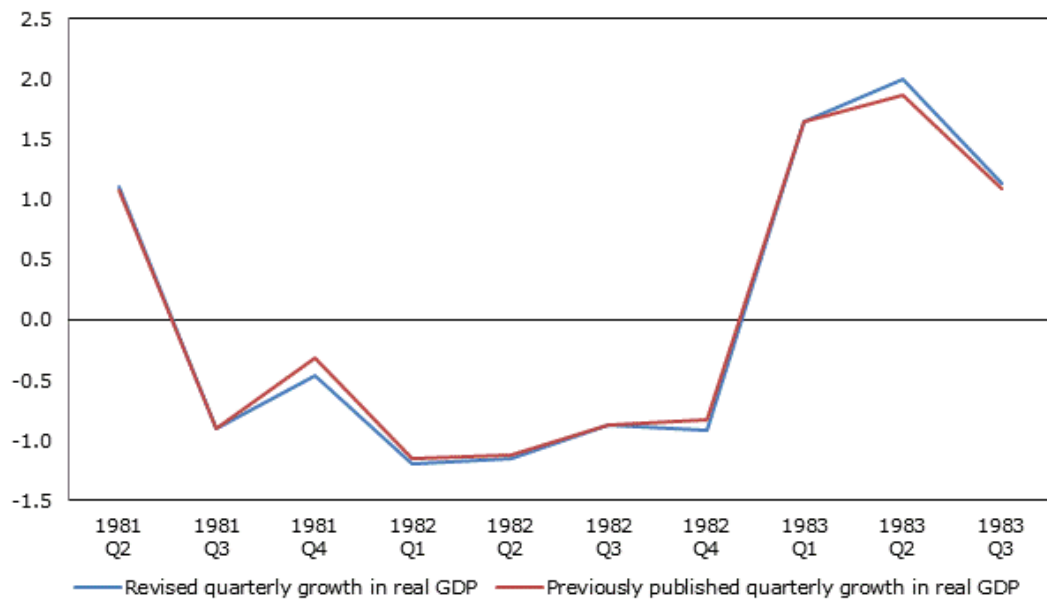
Source: Statistics Canada

The comprehensive revision did not change the business cycle over the period of the revision. The revised estimates continue to show a significant downturn in economic activity in 1981 to 1982, 1990 to 1991 and 2008 to 2009, as shown in charts 2, 3 and 4.

Chart 2
Revisions to quarterly real GDP 1981 to 1982

Business cycle - 1981 to 1982

percent growth
in real GDP

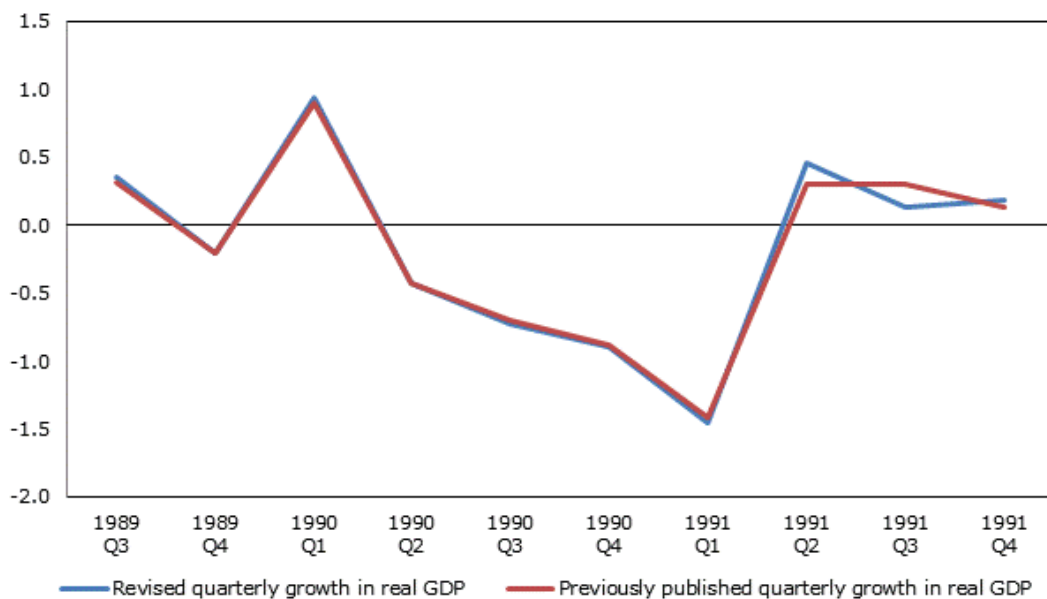


Source: Statistics Canada.

Chart 3
Revisions to quarterly real GDP 1989 to 1991

Business cycle - 1989 to 1991

percent growth
in real GDP

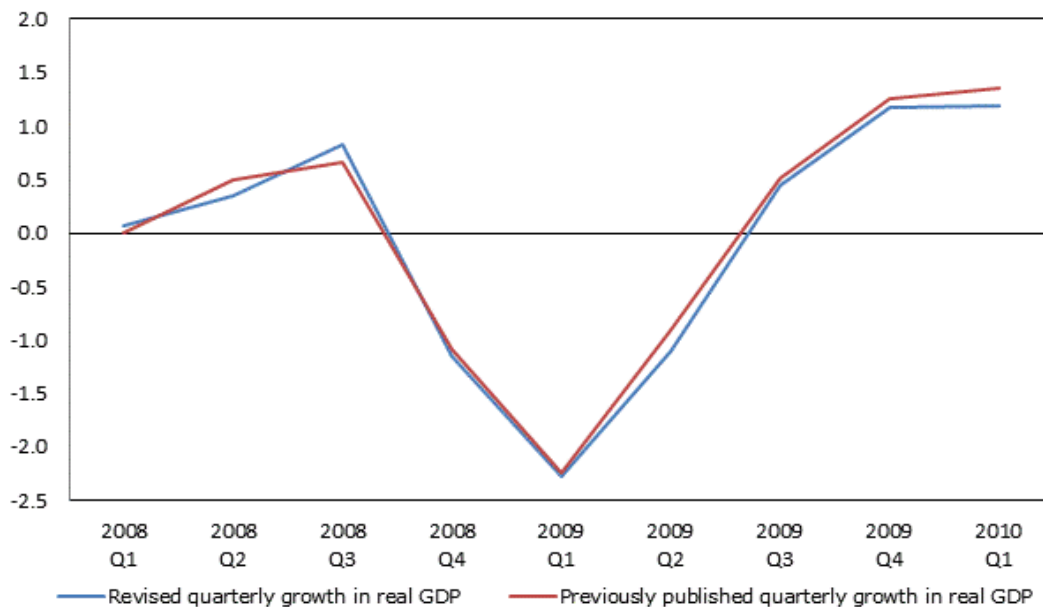


Source: Statistics Canada.

Chart 4
Revisions to quarterly real GDP 2008 to 2009

Business cycle – 2008 to 2009

percent growth
in real GDP



Source: Statistics Canada.

4. Revisions to income-based GDP components

All income-based GDP components were revised as part of the 2015 comprehensive revision.

Revisions to compensation of employees

The major revision to compensation of employees was attributable to a revised treatment of defined benefit pension plans. Defined benefit pension plans are pension schemes that provide participants with a guaranteed future income stream upon retirement based on a formula (for example, a percentage of pay and years of service formula).

Pensions are contractual obligations between employers and employees. The contract entitles the employee to receive, as part of their compensation, a contribution to a pension plan made on their behalf by their employer. In theory, the contribution received by the employee should equal, in each accounting period, the amount they are entitled to as per the contractual obligation. For defined benefit plans, the entitlement represents the present value of future pension benefits. In practice, for a given period, the contributions of businesses and governments do not always match the entitlements of the employee. Sometimes contributions are less than entitlements, indicating that employers are underfunding the pension, and sometimes they are more, indicating that employers are overfunding the pension or attempting to reduce the underfunding of previous periods. The 2008 System of National Accounts recommends that the pension contributions be recorded as compensation of employees (employer social contributions) and that they reflect the entitlement accruing to the employee during the accounting period, rather than the cash contribution made by employers.

The previous treatment of pensions in the CSMA led to distortions in the compensation of employees series. For example, in Nova Scotia in 2011, the Government of Nova Scotia made large payment to the Nova Scotia Public Service Pension Plan. This payment reflected a 'catch-up' payment made by the government to ensure that the pension plan was properly funded to meet its future obligations. This resulted in a 23.9% increase in the employer social contributions in the province of Nova Scotia for the year 2011. The 23.9% did not represent an economic increase in the employer social contributions for 2011 but rather reflected an accumulation of past payments of employer social contributions that should have been recorded in previous years. The new treatment of pensions in the CSMA removes these distortions and places the payment in the period it was earned or entitled.

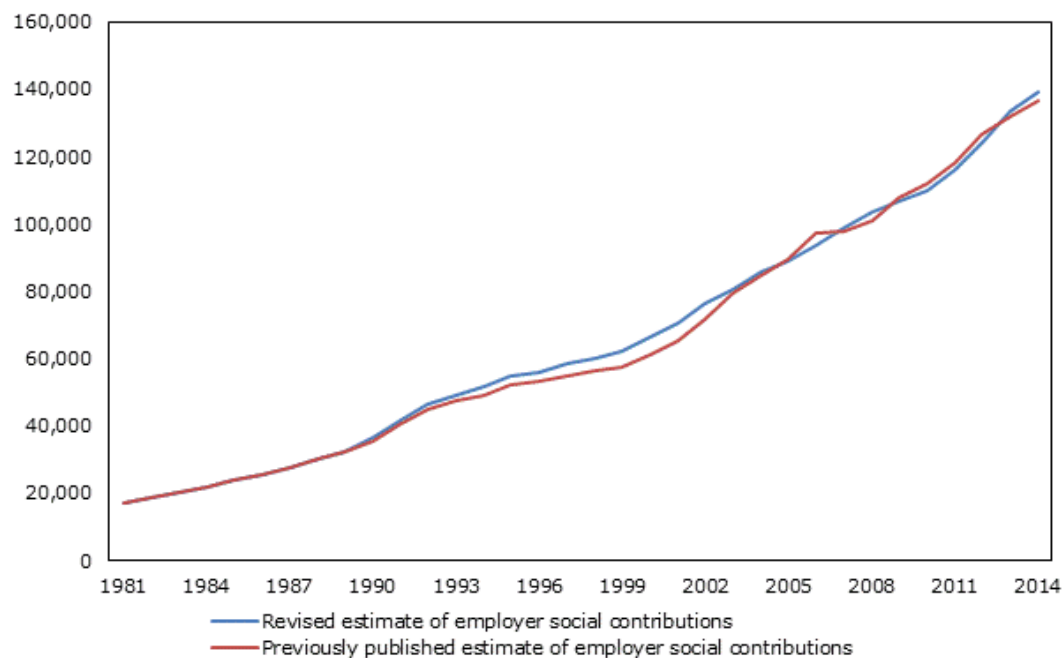
Recording pensions on an entitlement basis brings a number of important improvements to the national accounts. First, it aligns the timing of the flow of compensation of employees with the actual production of goods and services occurring during the accounting period. Second, it ensures that in each period the full pension assets and liabilities (the actuarial asset or

liability) are recorded on each of the balance sheets of governments, trustee pension plans, non-financial corporations and households, rather than the cash value of the accumulated asset or liability adjusted for market value. This ensures that the saving and consumption behaviours of governments and households are consistent with the stock of pension assets and liabilities on their respective balance sheets.

The recording of pension entitlements (pensions on an accrual basis) has resulted in revised estimates of employer social contributions for the period 1990 to 2015. Revisions were not carried back prior to 1990, as it was determined that the actual contributions were a good approximation of the entitlements for the period 1981 to 1990. Chart 5 compares the revised employer social contributions with the previously published employers' social contributions. The revisions served to smooth out the series for the period open to revision. The total value of pension contributions over the period on the old basis was \$595 billion while the total value of pension entitlements over the same period is \$627 billion.

Chart 5
Revisions to employer social contributions

millions of dollars



Source: Statistics Canada.

Revisions to gross operating surplus

Revisions to gross operating surplus were relatively small for the period 1981 to 2005 and larger for the period 2006 to 2015. The majority of the revisions for the 2010 to 2014 period reflect the incorporation of benchmark information from annual business survey's and updated administrative data records.

Table 4
Revisions to the gross operating surplus of non-financial corporations

Time period	Revised estimate of gross operating surplus - non-financial corporations	Previously published estimate of gross operating surplus - non-financial corporations	Average revision to gross operating surplus - non-financial corporations
	millions of dollars		
1981 to 1989	108,874	105,755	3,118
1990 to 1999	157,751	153,784	3,967
2000 to 2009	308,256	305,937	2,319
2010 to 2014	398,749	408,924	-10,175

Source: Statistics Canada.

General government gross operating surplus, which reflects the consumption of fixed capital of the general government sector, was revised down with the 2015 comprehensive revision. The downward revision reflects changes in the service lives associated with the stock of government capital, as well as an improved methodology to estimate the consumption of fixed capital by sector. It was established that the asset services lives previously used in the CSMA were too high for non-residential buildings and structures, resulting in a lower value of the consumption of fixed capital. The revised services lives were calculated using a rich set of data constructed from over 10 years of responses to Statistics Canada's *Capital Expenditure and Repair Survey*. The *Capital Expenditure and Repair Survey* collects information on the life of assets (both expected and actual). Estimates of service lives and depreciation profiles by asset are constructed from this information. These new service-lives data indicate that the stock of general government capital should have been consumed at a faster pace than previously estimated, increasing the consumption of fixed capital in the general government sector.

This service-lives increase was more than offset by a downward revision in the consumption of fixed capital due to an improvement in the way the capital stock is estimated by sector. With the improved capital stock estimates released in November 2014, there was a downward revision in the overall stock of capital estimated for the general government sector. This served to reduce the general government consumption of fixed capital over the revision period.

The combined result of the upward revision due to revised services lives and downward revision due to a revised capital stock is a small overall downward revision to total general government consumption of fixed capital, as shown in Table 5. Similarly, estimates of consumption of fixed capital for the non-profit institutions serving households' sector was also revised down.

Table 5
Revisions to consumption of fixed capital – governments

Time period	Revised estimate of consumption of fixed capital - general government	Previously published estimate of consumption of fixed capital - general government	Revision to the estimate of consumption of fixed capital - general government
millions of dollars			
1981 to 1989	14,683	14,447	236
1990 to 1999	22,867	23,384	-517
2000 to 2009	36,662	37,628	-966
2010 to 2014	58,735	60,151	-1,416

Source: Statistics Canada.

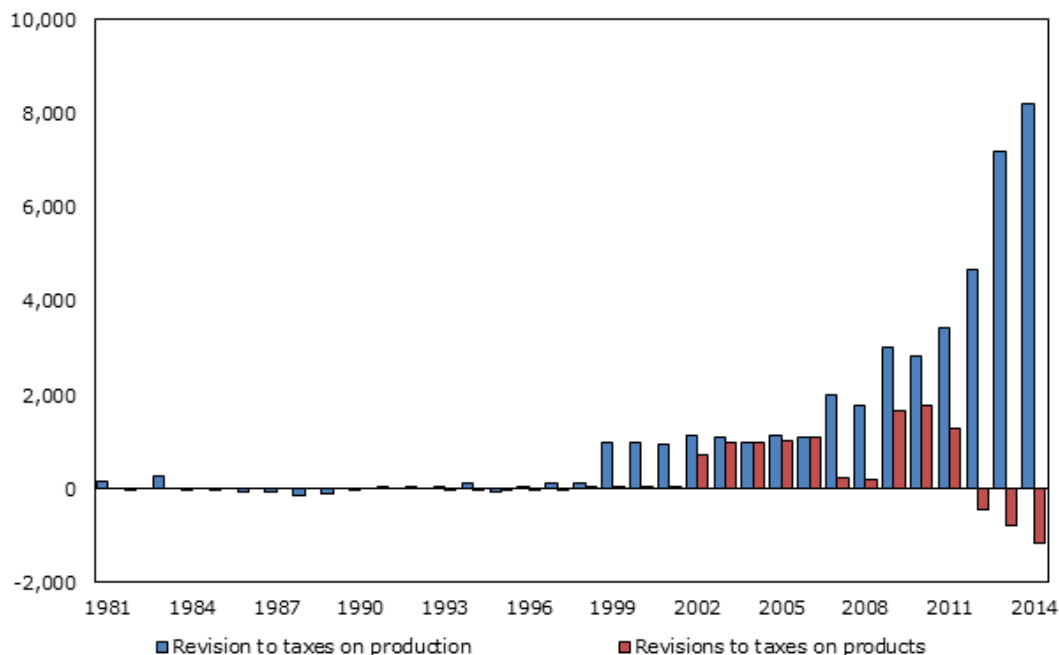
Revisions to taxes less subsidies on products and imports and taxes less subsidies on production

There were substantial revisions to taxes on production, due to the incorporation of improved government finance statistics. These revisions, like the revisions to general government final consumption expenditures, are due to the availability of new data sources, allowing for an improved delineation of taxes and subsidies.

As discussed previously, since 2007, the value of lot levies in-kind had been understated in the CSMA. Lot levies are classified as taxes on production in the CSMA. Lot levies in-kind represent the transfer of land improvements and structures by developers to municipalities upon the completion of development activities. An example is when a land developer develops a park within a sub-division and then transfers the land improvements associated with the park to the local municipality. The municipality accepts the land improvements in lieu of taxes. Chart 6 outlines the revisions to taxes on production—approximately half this revision is due to the treatment of lot levies in-kind. In addition to the lot levies revision, property taxes were also revised upward, essentially starting in 2011. The incorporation of the new government data provided a new, higher quality estimate of property taxes, resulting in an overall upward revision to taxes on production.

Chart 6
Revisions to taxes on products and taxes on production

millions of dollars

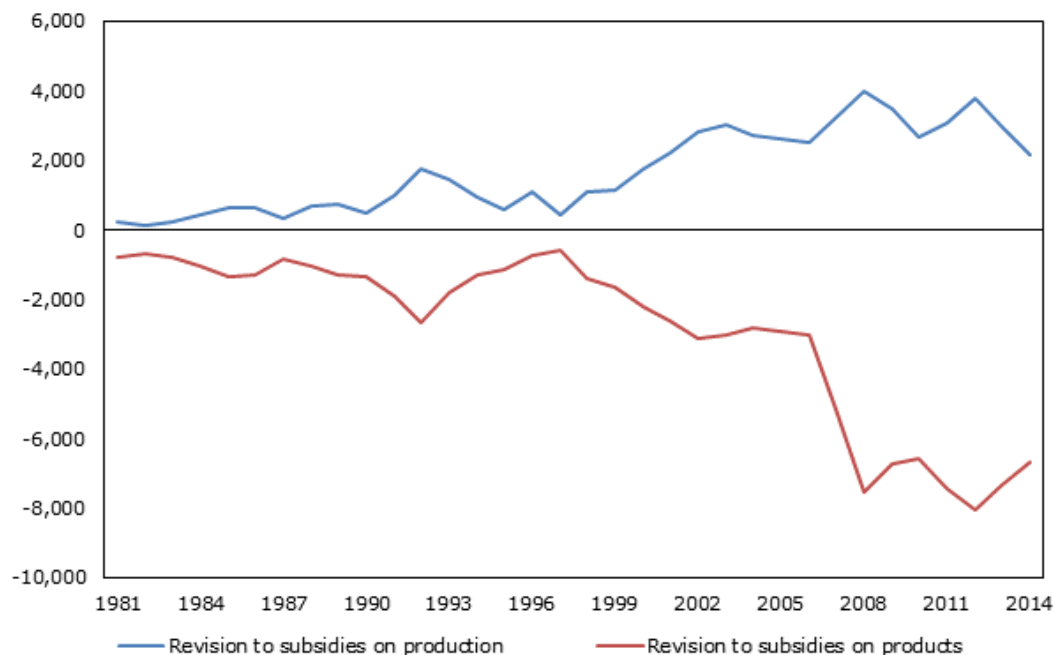


Source: Statistics Canada.

Similarly, there was an increase in the value of subsidies on production. A significant portion of the upward revision was due to the reclassification of subsidies related to crop insurance provided to farmers. Previously these were classified as subsidies on products. A review determined that these transactions better reflect subsidies on production, given they influence the production of the crop and are directed at farmers rather than levied on the sales directed towards consumers. As a result, subsidies on production were revised upward and subsidies on products were revised downwards as shown in Chart 7. The revisions to subsidies were also reflected in the gross operating surplus of corporations.

Chart 7
Revisions to subsidies on products and production

millions of dollars



Source: Statistics Canada.

5. Revisions to expenditure-based GDP components

The majority of expenditure-based GDP components were revised with the 2015 comprehensive revision.

General government final consumption expenditure

As noted, government final consumption expenditure was revised significantly for the period 2010 to 2014. Revisions occurred for all levels of government and all major components of final consumption expenditure (consumption of fixed capital, compensation of employees and other non-wage expenditures). Total general government final consumption expenditure was revised down by an average of \$9.9 billion per year between 2010 and 2014. Although compensation of employees was revised upwards, it was more than offset by downward revisions in consumption of fixed capital and other non-wage components.

Table 6
Revisions to general government final consumption expenditure

Time period	Current general government final consumption expenditure	Previously published general government final consumption expenditure	Total revision	Revision to general government compensation of employees	Revision to general government consumption of fixed capital	Revision to general government, other non-wage
millions of dollars						
1981 to 1989	110,142	108,762	1,380	0	0	0
1990 to 1999	177,949	177,020	930	0	0	0
2000 to 2009	271,458	271,531	-73	2,016	-441	-2,761
2010 to 2014	384,335	394,183	-9,848	7,792	-1,416	-15,118

Source: Statistics Canada.

Revisions were concentrated in the local government sub-sector. On average, local general government final consumption expenditure was revised down by \$5.5 billion for the period 2010 to 2014. The downward revision is a result of updated data for local governments incorporated into the CSMA. Previously, data were estimated from incomplete local general government documents and often reflected budgetary information. The revised estimates now align with the actual spending by local general governments and incorporate the latest available information from public accounting statements. Revisions to final consumption expenditure for federal and provincial or territorial governments were smaller than local governments. Federal government revisions mainly reflect changes in the treatment of employer pensions; whereas revisions to the provincial and territorial government reflect new estimates compiled directly from provincial and territorial general ledgers. This improved data source permits a better estimate of provincial and territorial general government final consumption expenditures.

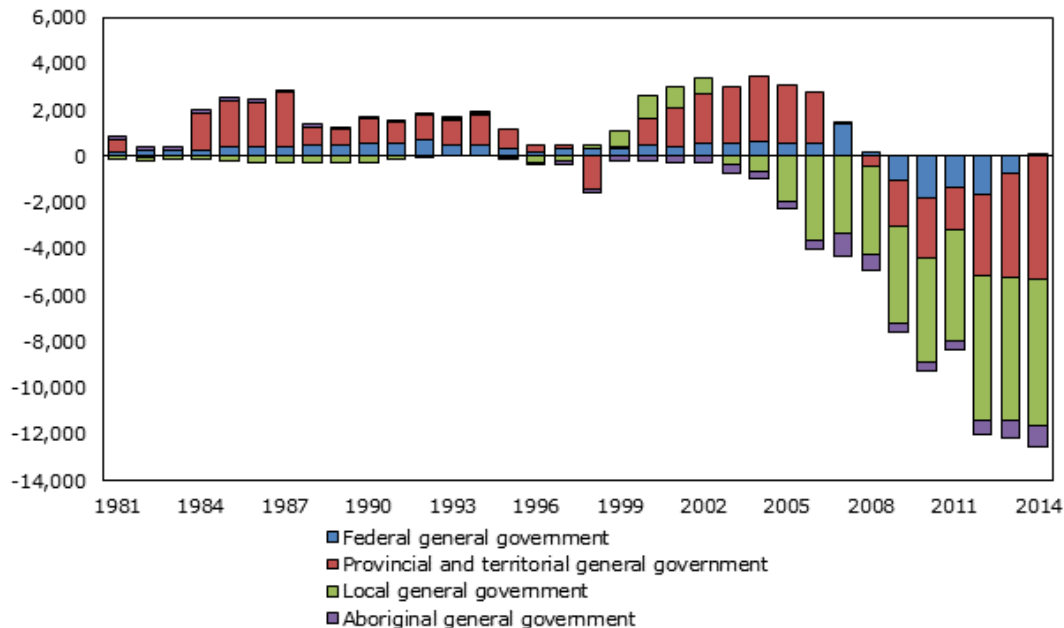
Table 7
Revisions to general government final consumption expenditure by sector

Time period	Average current general government final consumption expenditure	Average previously published general government final consumption expenditure	Average total revision	Average revision to federal general government final consumption expenditure	Average revision to provincial and territorial general government final consumption expenditure	Average revision to local general government final consumption expenditure	Average revision to Aboriginal general government final consumption expenditure
millions of dollars							
1981 to 1989	110,142	108,762	1,380	357	1,080	-190	134
1990 to 1999	177,949	177,020	930	433	552	11	-64
2000 to 2009	271,458	271,531	-73	438	1,264	-1,538	-419
2010 to 2014	384,335	394,183	-9,848	-1,070	-3,568	-5,588	-609
Total period	217,854	218,685	-831	193	295	-1,321	-196

Source: Statistics Canada.

Chart 8
Revisions to general government final consumption expenditure by level of government

millions of dollars



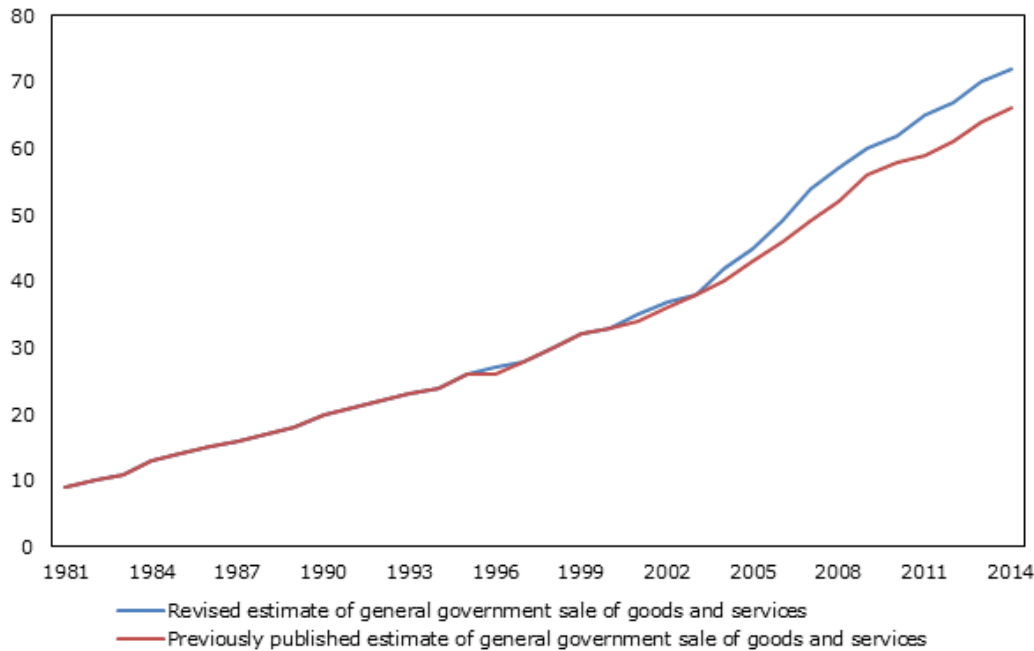
Source: Statistics Canada.

Part of the revision to general government final consumption expenditure is attributable to an upward revision in the sale of government goods and services. Smaller revisions were recorded for the period 1981 to 2003 while more substantial revisions were incorporated for the period 2004 to 2014. Sales of goods and services of general governments include items such as the rental of recreational facilities and the purchase of permits.

The value of general government final consumption expenditure that is used in the calculation of expenditure-based gross domestic product is net of the sale of goods and services. For example, if the government spends \$100 to deliver a service and receives \$25 from a household in the form of a user fee then the 'net' general government final consumption expenditure is \$75. This 'netting' is done to avoid double counting in the calculation of gross domestic product, since the sale of the government good or service is either a purchase by households (and therefore included in household final consumption expenditure) or intermediate consumption, purchased by businesses (and therefore a subtraction in the calculation of gross domestic product). An upward revision in the general governments' sale of goods and services without a corresponding upward revision in household final consumption expenditures will result in a downward revision to gross domestic product. This is the case with this revision. In previously-published estimates the sales of the general government goods and services were properly reflected in the individual household final consumption expenditure series but not reflected in the general government final consumption expenditure. In addition, some of the upwardly revised sales of goods and services were sold to businesses. Both of these result in a downward revision to gross domestic product.

Chart 9
Revisions to general government sales of goods and services

billions of dollars



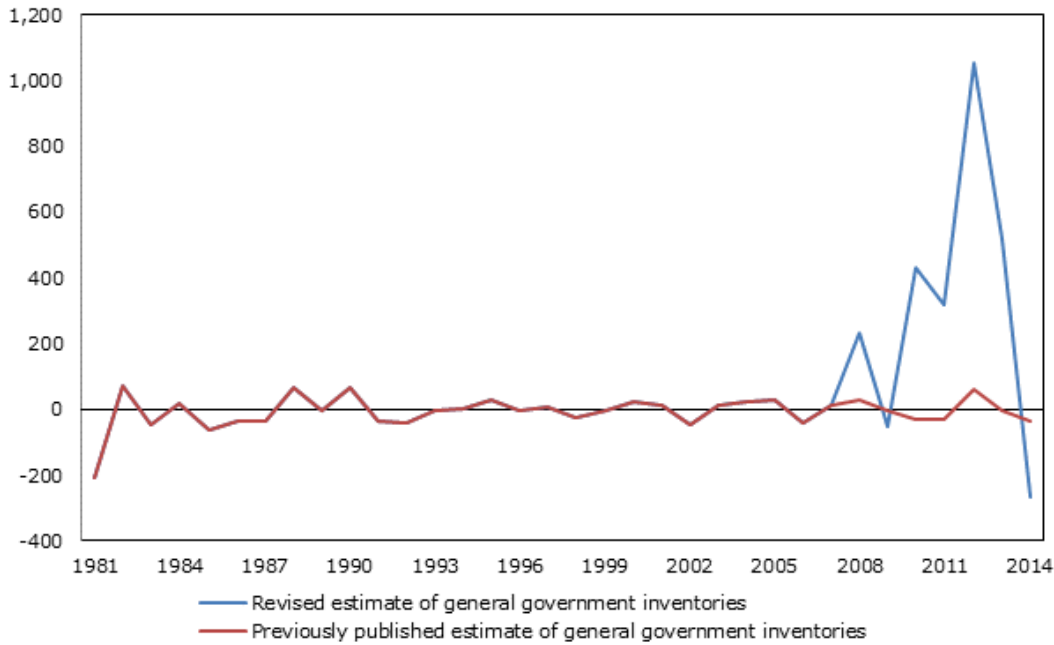
Source: Statistics Canada.

Inventories

The improved granularity associated with the new GFS data permitted the estimation of new components of government inventories not possible with prior sources of information. In the past, all expenditures of government were recorded as current government final consumption expenditure, regardless of whether they were consumed in the accounting period or not. International standards recommend that government expenditure be recorded when the goods and services are consumed rather than when the material inputs are purchased. Given the detailed nature of the government data now available to construct Canada's national accounts, it is possible to estimate the value of government investment in inventories, starting in 2007. Prior to that date, purchases held in inventory are recorded as government final consumption expenditure.

Chart 10
Revision to general government investment in inventories

millions of dollars



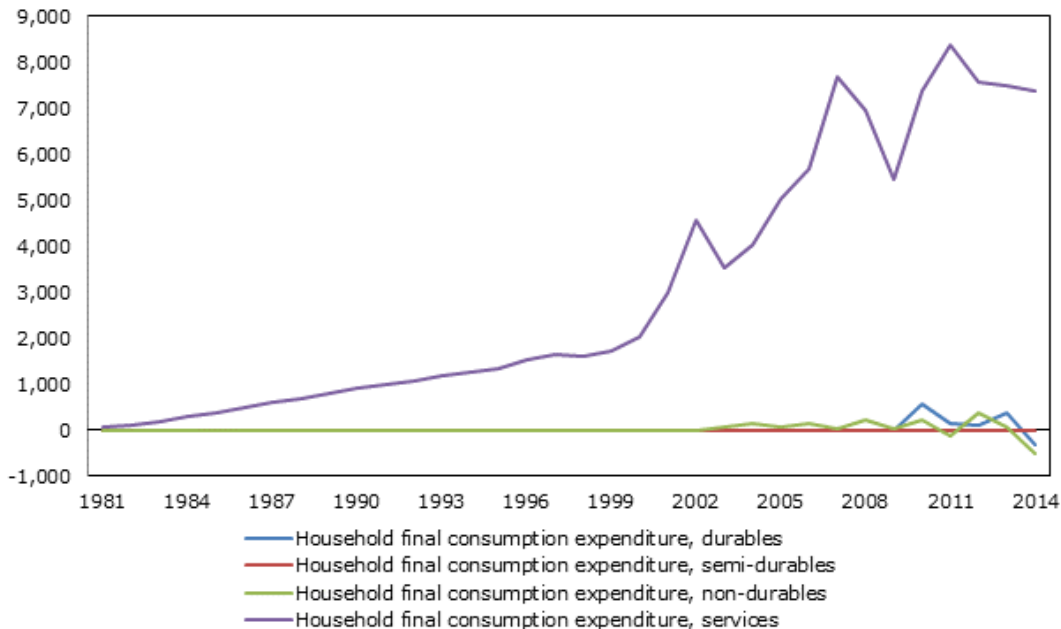
Source: Statistics Canada.

Household final consumption expenditure

With the 2015 comprehensive revision, there were substantial upward revisions to household final consumption expenditure, mainly due to revised estimates of household purchases of financial services, specifically financial investment services, as described earlier. Revisions to other components were much smaller and mainly reflect the reclassification of transactions. For example, driver's licence fees were previously classified as a tax and are now classified as household final consumption expenditure. Chart 11 provides a breakdown of the revision to household final consumption expenditure by durability class.

Chart 11
Revisions to household final consumption expenditure by durability class

millions of dollars



Source: Statistics Canada.

Residential and non-residential investment

As noted, the CSMA previously underestimated the lot levies charged to land developers by municipalities. In a number of jurisdictions in Canada land developers provide assets, such as parks, to local governments in lieu of paying these land development fees. In the past, since their value was not known, these in-kind development fees were not included in the methodology used by Statistics Canada to determine the market price of residential investment. These in-kind lot levies—which represent a part of the basic price of a residential structure—have now been added to the value of construction investment. Data have been revised back to 2007, as it was determined that fees of this nature are insignificant prior to this time. Over the 8-year period the value of residential and non-residential investment was revised up by an average of \$2.4 billion, residential investment, in particular, was revised \$1.8 billion.

Table 8
Revisions to investment in residential structures

Time period	Current estimate of investment in residential structures (business sector)	Previously published estimate of investment in residential structures (business sector)	Revision to investment in residential structures (business sector)
millions of dollars			
1981 to 1989	29,541	29,541	0
1990 to 1999	40,504	40,504	0
2000 to 2009	83,008	82,492	515
2010 to 2014	124,705	122,732	1,973
Total period	62,485	62,044	442

Source: Statistics Canada.

Exports and imports of goods and services

Revisions to exports and imports were minimal over the revision period. The majority occurred for the period 2010 and 2014 and were a result of the incorporation of new benchmark information available from the supply-use tables and the international merchandise trade statistics program.

6. Revisions to incomes, consumption, saving and net lending or borrowing by sector

Revisions to household incomes, consumption and saving due to changes in the treatment of pensions

There were revisions to household income, consumption and saving for the period 1981 to the present. The majority of the revisions to household income reflect the changes in the treatment of defined benefit pension plans. This served to smooth out the flows associated with pensions (contributions, investment income and withdrawals) to and from the household sector, resulting in both upward and downward revisions over the historical period.

As noted earlier, household pensions are now recorded on an entitlement (accrual) basis rather than on a cash basis in the CSMA. This means that the CSMA records the value of pension benefits accrued to them as part of their pension contract rather than the actual cash contributed in a given period. This new treatment results in four new flows in the household sector's current and capital accounts. An example of these flows is depicted in Table 9.

The first flow represents the contribution made by the employer to the employee for the labour services provided during the accounting period. As noted earlier, this flow represents the contractual obligation of the employer to the employee and not the cash contribution. For example, suppose that, according to the contractual obligation, the employer was required to contribute \$50 to the employee's pension fund but only contributed \$25. Within the CSMA the full \$50 would be recorded. The CSMA would recognize the actual contribution of \$25 as well as impute an additional \$25 contribution as showing in Table 9.

The second flow relates to a corresponding accrual treatment with respect to the property income received by the household sector from the pension plan. As an example, assume an employer has entered into a contractual obligation with a group of employees and will pay them 50% of their latest year's annual income upon retirement. Assume that, at the moment, the employer has not made any contributions to the pension plan and an actuarial assessment has determined that to meet contractual obligations there should be \$50 million in the fund. Had the employer made the \$50 million contribution, the funds would have been invested and earned investment income. This foregone property income is now imputed within the CSMA.

and recorded as a flow from the pension fund to the household sector. For the purposes of the example assume that this imputed flow of income is \$5 and is represented in Table 9 as the receipt of property income by households from pension funds, recorded in the financial corporations' sector.

The third flow reflects the household's contributions to the pension plan. Employer contributions to pension plans on behalf of employees are first reflected in the CSMA as compensation of employees and recorded in the household sector. These funds are then transferred from the household sector to the pension fund. Similarly, the investment income earned on a pension fund is first recorded as earned by the household sector, since they are the ultimate owner of the asset. The sector then re-invests (or transfers) this investment income back into the pension fund. In the past, these flows were not explicitly identifiable because pension funds were part of the household sector. Pension funds are now shown in the financial corporations' sector and the flows between the sectors are fully articulated. In the household sector table, these flows are recorded as current transfers to financial corporations. For the purposes of the example this represents a flow of \$75 from the household sector to the financial corporation sector - \$50 reflecting the contributions (actual and imputed) from the employer, \$20 reflecting the employees contribution to their pension fund and \$5 reflecting the reinvestment of property income earned.

The fourth new flow in the household sector's current and capital account are related to pension benefits paid to pensioners. In the past, these flows were simply reflected as a drawing-down in the household sector's pension assets and were only visible as a change in pension assets from one period to the next. With the 2015 CSMA revision, these contributions are recorded as current transfers received by households from financial corporations. Assume, for the purposes of the example that \$20 was withdrawn from pension funds in the accounting period.

The final flow added to the household sector's current and capital account is the 'change in pension entitlements'. This flow is required to ensure that the entire pension asset (including the unfunded portion) is recorded in the household sector. It represents the difference between pension withdrawals and pension contributions and investment income transferred from the household to the pension fund. This is reflected in the \$55 in change in pension entitlements in Table 9.

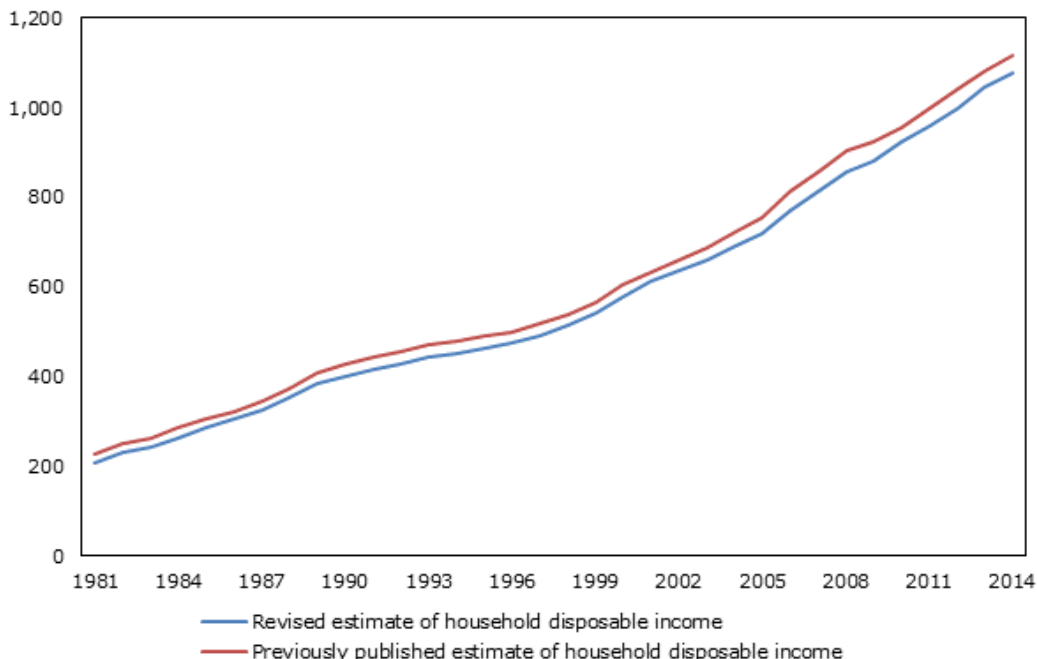
Table 9
Fictitious example – Pension flows in the household sector and financial corporations sector

Flow	Non-financial corporations sector	Household sector	Financial corporations sector
Actual employer social contributions	-25	+25	
Imputed employer social contributions	-25	+25	
Property income received		+5	-5
Current transfers (pension contributions)		-75	75
Current transfers (pension withdrawals)		+20	-20
Household disposable income		-55	
Change in pension entitlements		55	-55
Source: Statistics Canada.			

Given that the household sector's contributions to pensions have been larger than their withdrawals over the period of the revision and the new flow – change in pension entitlements is added after the calculation of household disposable income – household disposable income was revised downward as shown in Chart 12.

Chart 12
Revisions to household disposable income

billions of dollars



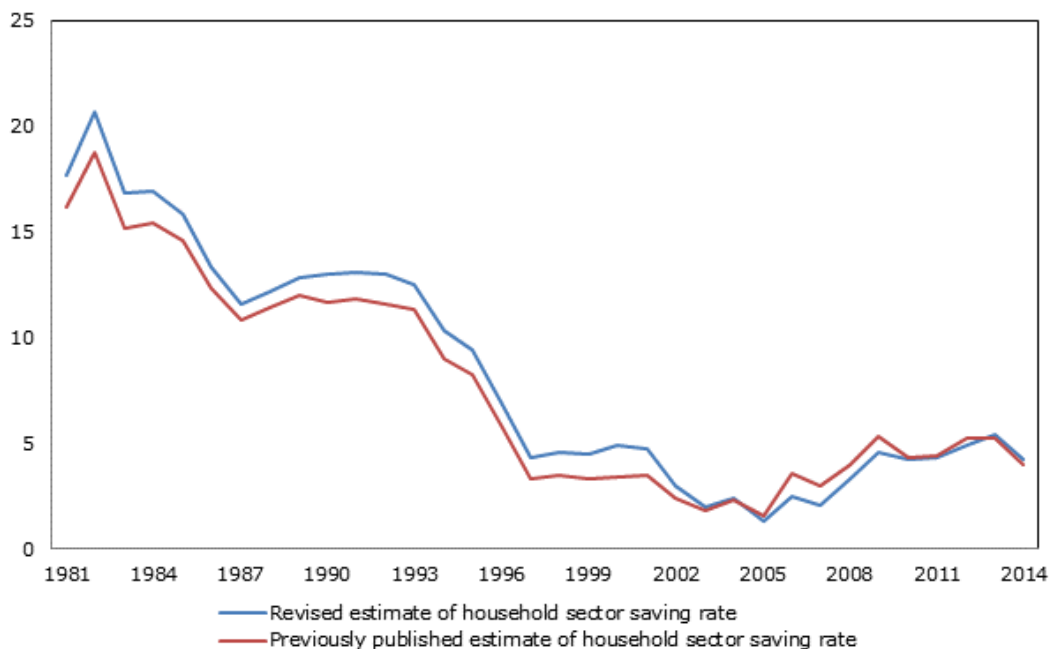
Source: Statistics Canada.

Revision to the household saving rate

As mentioned, household consumption was revised up. This increase in consumption was smaller than the upward revision to household disposable income (including the change in pension entitlements) and therefore household saving was generally revised upward, with larger revisions recorded in the 1981 to 2003 time period. The household saving rate (household saving divided by household disposable income) was revised from an average of 7.7% to 8.3% between 1981 and 2014.

Chart 13
Revision to household sector saving rate

saving rate

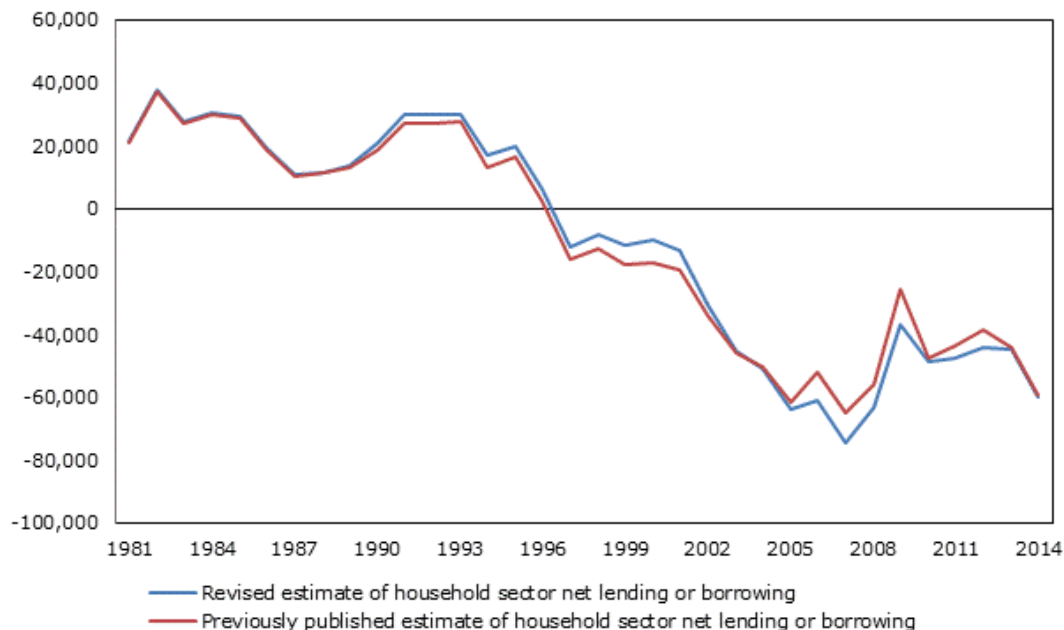


Source: Statistics Canada.

This revision to the household sector did little to change the sectors' net lending or borrowing position. As illustrated in the following chart, in 1996, households moved from a net lending to a net borrowing position, which meant that the savings households generated were no longer sufficient to meet their demand for funds to invest in non-financial assets, such as residential structures. This position remains unchanged. Chart 14 compares the current and previously published net borrowing position of households.

Chart 14
Revision to household sector net lending or borrowing

millions of dollars



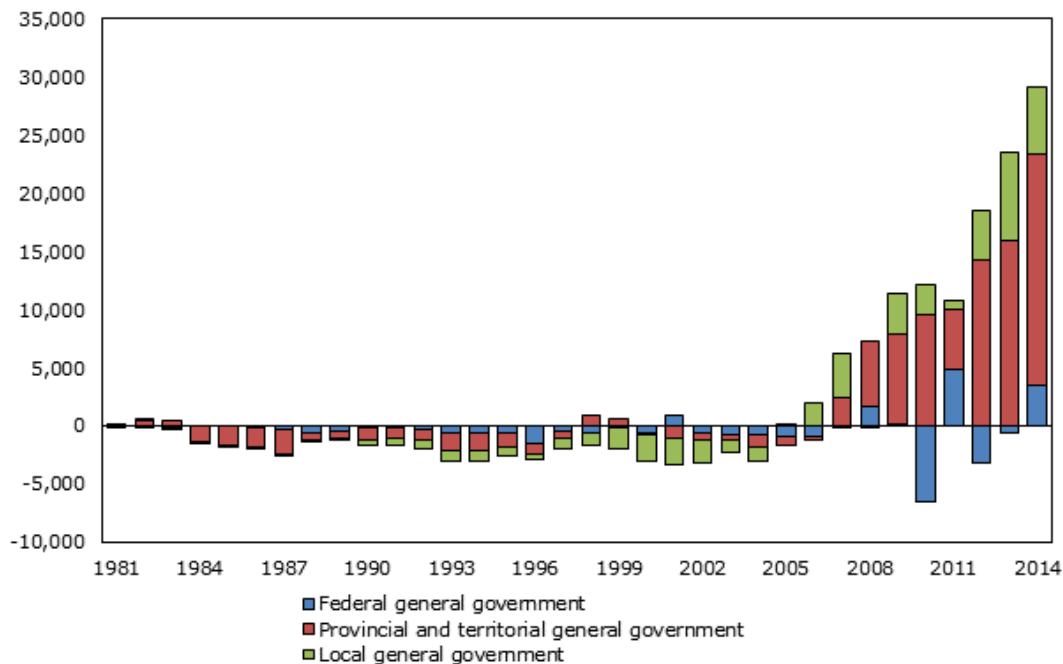
Source: Statistics Canada.

Revisions to the net lending or borrowing of governments

The net lending or borrowing positions of general governments were revised substantially over the revision period—specifically in the 2007 to 2014 period. On average, between 2007 and 2014 the general governments borrowed less than was previously estimated. This revision was mainly due to a downward revision in general governments' final consumption expenditure and an upward revision in taxes. The lower general governments' final consumption expenditure resulted in a higher level of saving and a lower requirement for borrowing (a downward revision to their demand for funds).

Chart 15
Revisions to net lending by level of government

millions of dollars



Source: Statistics Canada.

7. Revisions to financial flows and balance sheets

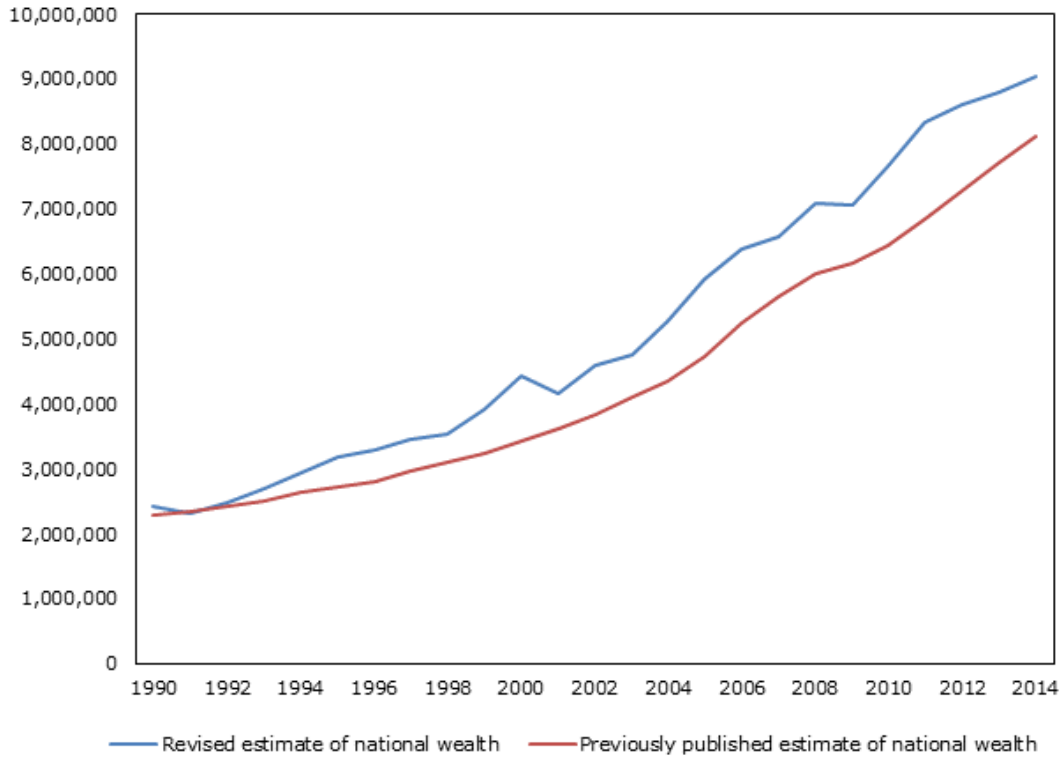
Revisions to national wealth were substantial over the entire revision period. Canada's national wealth represents the current market value of all non-financial assets (machinery, buildings, roads, bridges, factories, etc.) owned by residents of Canada. Revisions are the result of three factors. The first is a revision in the service lives attributed to non-financial assets. A recent study indicated that services lives previously used to depreciate Canada's non-residential buildings were too high and they were therefore revised downwards. The result is a faster depreciation of the capital stock of non-residential buildings and a downward revision the fixed capital component of national wealth.

The second reason for the revision to national wealth is the addition of selected natural resources to Canada's quarterly balance sheet, which had only been recorded in the consolidated annual balance sheet. Previously, resources such as exploitable oil reserves, timber resources, and mineral deposits were not included in Canada's official measure of national wealth. These important assets have now been added to the national balance sheet as non-produced assets, reflecting their significant role in the production process. They are a key input into Canada's economic growth and a significant factor in understanding the valuation of the non-financial portion of the balance sheet.

The third revision is due to improved estimates of the value of residential real estate held by households. Previously, the value of residential real estate (houses and land) was estimated using the perpetual inventory method for the value of housing, and a land-to-structure ratio to derive estimates of land. The latter methodology has been improved. Statistics Canada recently obtained access to municipal assessment files, which provide a much more current and accurate value of residential real estate. In addition, estimates from the most recent Survey of Financial Security indicated that an upward revision to land was required in order to properly estimate the value of residential real estate. Both the Survey of Financial Security and property assessment data are more reflective of the range of Canada's residential real estate. These new data sources have been incorporated into the land estimate included in Canada's national wealth.

Chart 16
Revisions to national wealth

millions of dollars



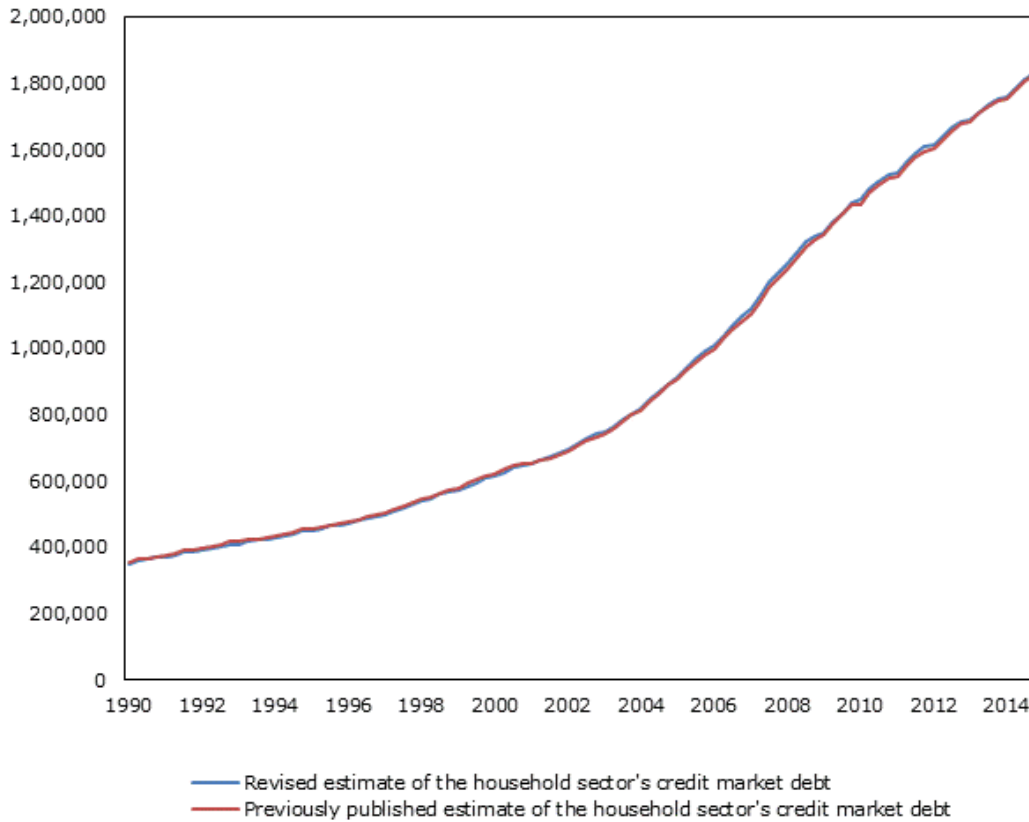
Source: Statistics Canada

Household credit market debt

There was little revision to household credit market debt over the revision period. The revised estimates continue to show a steady increase in the level of household mortgage and other credit market debt.

Chart 17
Revisions to household credit market debt

millions of dollars

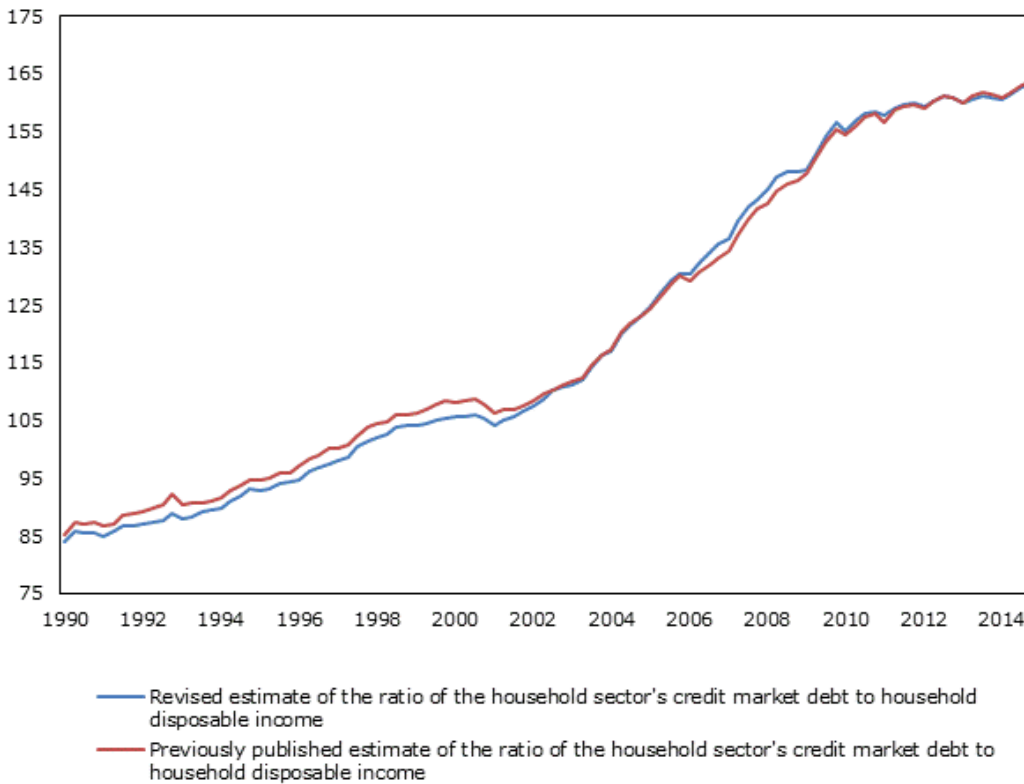


Source: Statistics Canada

The revision to the ratio of household credit market debt to disposable income was minimal over the period due to the correspondingly small revisions to the level of household credit market debt. Additionally, disposable income used in the calculation of this ratio excludes transactions relating to pension funds. This was done to maintain international comparability and time series consistency with our major partners.

Chart 18
Revision to household sector's ratio of credit market debt to household disposable income

percent



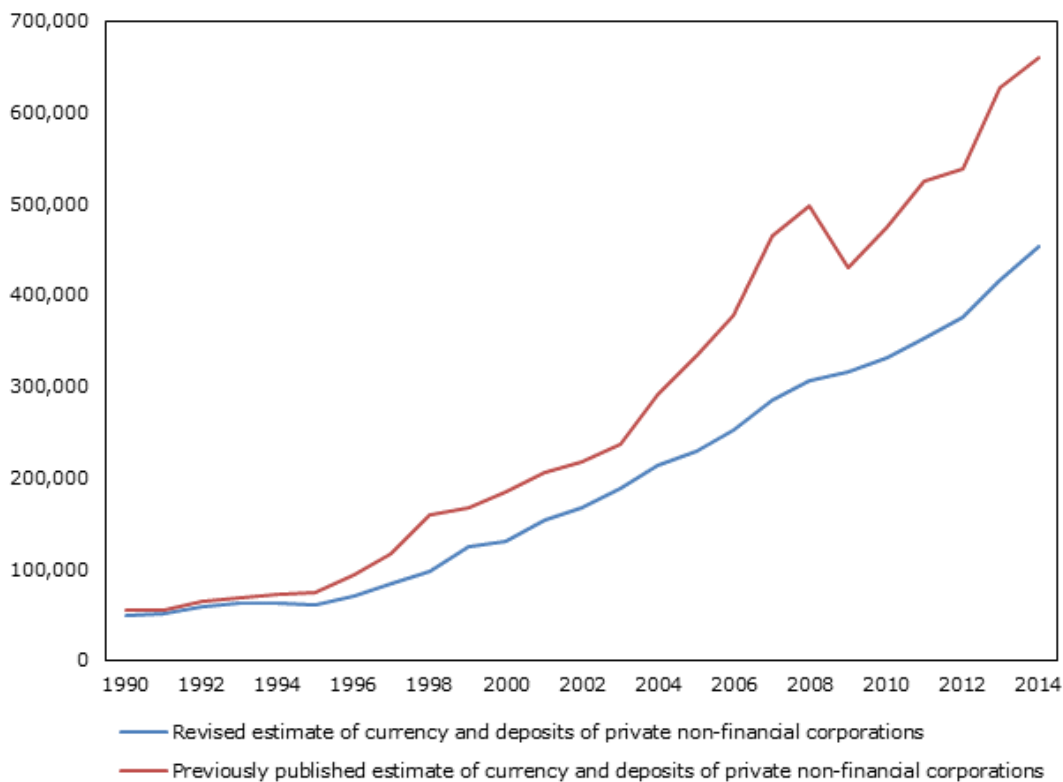
Source: Statistics Canada

Currency and deposits – non-financial corporations

Statistics Canada uses aggregate information, provided by Canadian chartered banks and other deposit-taking institutions, to estimate the stock of currency and deposits by sector. This information is supplied by type of deposit (for example, demand and notice, and fixed term deposit) and depositor sector. Additionally, this information follows prevailing business accounting rules in classifying chartered bank deposit liabilities. As such, they include covered bonds, bearer-deposit notes, and other securities issued by chartered banks in order to obtain funding. To better align with recommended international macroeconomic accounting standards, these bank liabilities have been re-classified to bonds and other short-term securities from currency and deposits. This re-classification strengthens the estimates, and will better depict the flow of funds by instrument in the economy. As a result of this change in classification, financial corporations (for example, pension funds and insurance companies) bonds and short-term securities were revised, as well as, the currency and deposits held by private non-financial corporations (shown in Chart 19). With this improved classification of instruments within the NBSA, the data still show a strong upward trend in both the overall liquidity and value of currency and deposits held by non-financial private corporations.

Chart 19
Revisions to currency and deposits of private non-financial corporations

millions of dollars



Source: Statistics Canada

General government debt

There was a downward revision to general governments' debt over the time period of the revision. The majority of the revision occurred in the 2006 to 2014 period, resulting primarily from the incorporation of the new government finance statistics into the macroeconomic accounts framework. Debt levels were revised downward for all levels of government (federal, provincial and territorial, local and Aboriginal general governments), although the revisions to the federal level were less substantial.

Table 10
Revisions to general government debt

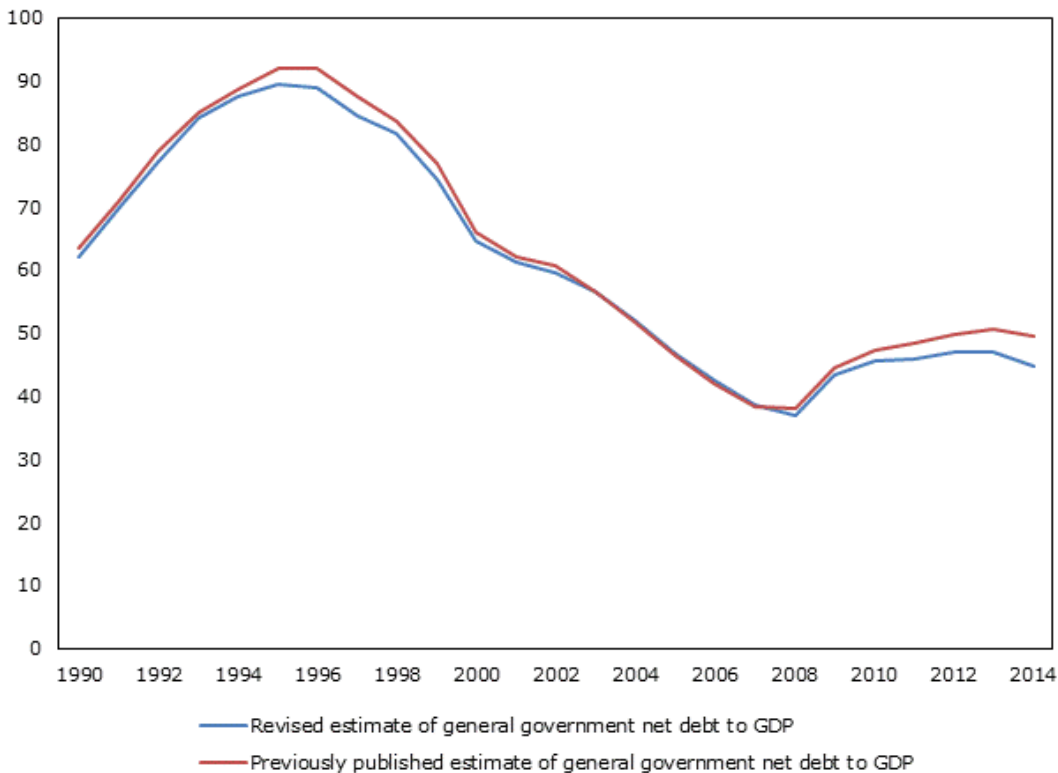
Time period	Revised average estimate of federal general government credit market debt	Previously published average estimate of general government credit market debt	Revision to the estimate of federal general government credit market debt	Current average estimate of other general government credit market debt	Previously published average estimate of other general government credit market debt	Revision to the estimate of other general government credit market debt
millions of dollars						
1990 to 1999	416,772	416,780	-8	277,867	273,223	4,644
2000 to 2009	436,615	435,031	1,584	425,216	407,663	17,554
2010 to 2014	643,783	630,421	13,362	695,828	650,488	45,340
Entire period	470,111	466,809	3,303	420,399	402,452	17,947

Source: Statistics Canada

The downward revision in debt levels resulted in an upward revision in the ratio of general government net debt to gross domestic product.

Chart 20
Ratio of general government net debt to gross domestic product

percent



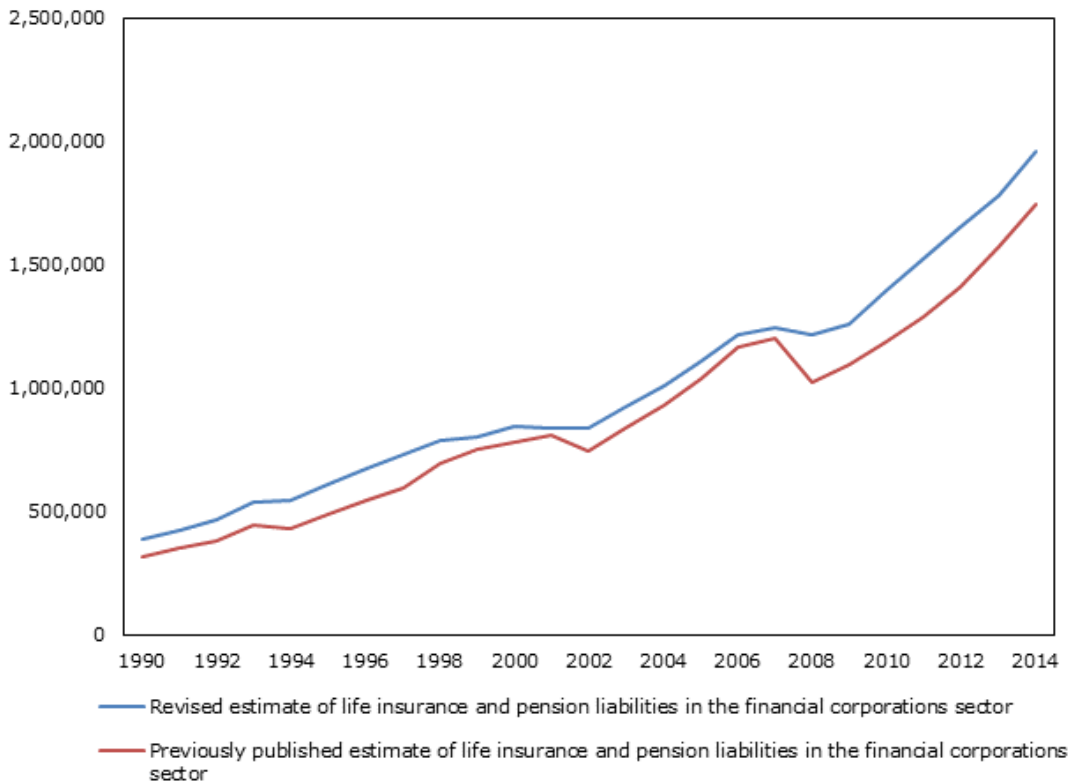
Source: Statistics Canada

Pension assets and liabilities

Pension assets were also revised as a result of the new accrual-based treatment of pensions. In the past, pension assets were recorded on a cash basis—meaning that the asset was only recognized when a cash payment was made to the fund by the contributors. Depending on the actuarial outlook of a fund, employers often took contribution holidays, which were sometimes followed by large lump-sum ‘catch-up’ payments. This resulted in a somewhat volatile profile of the asset through time. In that scenario, it was not possible to have a true picture of pension assets owing to the household sector at any point in time. The move to record pension contributions on an entitlement basis resulted in a revision to the profile of pension assets and liabilities in the financial corporations’ sector and the household sector, providing a more accurate picture of their true assets and liabilities.

Chart 21
Revision to life insurance and pension liabilities in the financial corporations sector

millions of dollars



Source: Statistics Canada

Other changes in assets account

The Canadian System of National Accounts is an integrated sequence of accounts. It consists of production accounts and a host of sector accounts including: income and outlay accounts, capital and finance accounts (financial flow accounts), and the national balance sheet accounts. However, one element of the sequence, the other changes in assets account—comprised of other changes in the volume of assets account and the revaluation account—although available implicitly, is not published. This component account constitutes the missing link between the flows recorded in the transactions' accounts and stocks recorded in the balance sheet.

Although it might be assumed that the flow of financial assets into a sector each year would represent the change in the sector's stock of financial assets, this is not the case, as seen in Chart 22 for the domestic economy. In fact, the 'other changes' (led by revaluations) far outweigh the financial flows. This other changes represent the change in financial assets due to changes in the price (largely fluctuations in the price of equities held directly or indirectly by the household sector).

The revaluation account represents the change in the monetary value of an asset or liability due to changes in the level and structure of its price. These revaluations are generally separated led by two sub-components: exchange rate changes and market price changes.

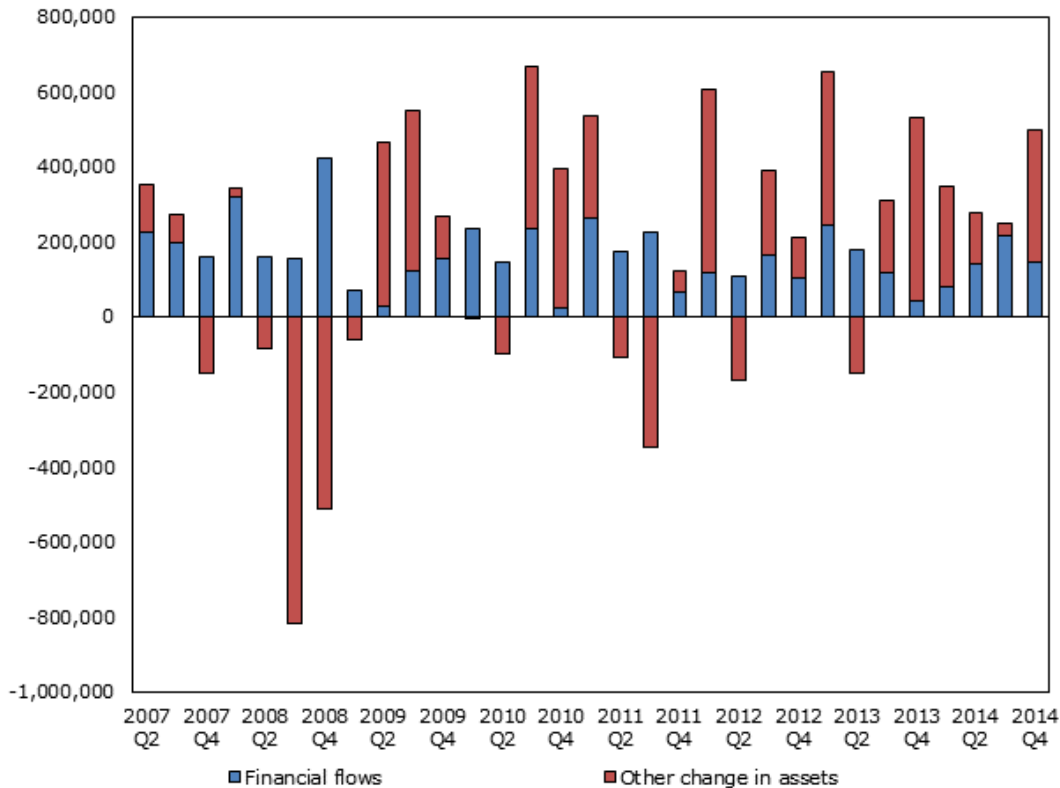
The other changes in the volume of assets account represents changes in the value of assets that are neither due to transactions nor revaluation. Examples include write-ups/downs of assets, economic appearance and disappearance of assets, reclassifications and changes in financial assets resulting from institutional units changing institutional sectors.

Chart 22

Total Financial assets of domestic economy

Changes in total financial assets due to financial flows and other changes in assets

millions of dollars



Source: Statistics Canada.

The international standard recommends that the other changes in assets account be broken into its component accounts: revaluation account and other changes in the volume of assets account. Statistics Canada is currently unable to provide this detail, but will release the aggregate other changes in assets account. The goal of this account is to provide data users with insight into how wealth is generated in each of the sectors of the economy. Changes in wealth—increases or decreases—due to saving are articulated in the financial account, while changes in wealth due to a price or volume change are articulated in the other changes in assets account.

8. Revisions to gross domestic product by province and territory

Given that the sizes of the provincial and territorial economies differ significantly, revisions across the provinces and territories are examined in terms of their relative size. The average revised level of gross domestic product is compared to the previously published average level of gross domestic product for the period 1981 to 2013.

The largest downward revisions occurred in Nunavut and Newfoundland and Labrador while the largest upward revision occurred in Manitoba and New Brunswick. The smallest revisions occurred in Prince Edward Island, Saskatchewan and Quebec.

Table 11
Revision to the level of gross domestic product by province and territory

Province/Territory	Revised estimate of the average level of gross domestic product (1981 to 2013)	Previously published estimate of the average level of gross domestic product (1981 to 2013)	Revised estimate of the average level of gross domestic product (1981 to 2013) as a share of the previously published estimate
	millions of dollars		percent
Newfoundland and Labrador	15,559	15,672	99.28
Prince Edward Island	3,135	3,138	99.90

Nova Scotia	23,488	23,595	99.55
New Brunswick	19,032	18,918	100.60
Quebec	210,674	211,017	99.84
Ontario	400,241	398,413	100.46
Manitoba	33,497	33,253	100.73
Saskatchewan	35,437	35,480	99.88
Alberta	145,990	145,241	100.52
British Columbia	124,399	124,149	100.20
Yukon	1,304	1,300	100.31
Northwest Territories ¹	4,058	4,043	100.37
Nunavut ¹	1,407	1,429	98.46

1 (1999 to 2013)

Source: Statistics Canada

Revisions to growth in real gross domestic product by province and territory were minimal over the revision period. The average absolute mean revision to real gross domestic product ranged between a high of 1.47 percentage points in Nunavut to a low of 0.15 percentage points in Ontario. In terms of average growth over the 1981 to 2013 period, Alberta remains the province with the largest growth rate, averaging a 3.13% annual real growth over the period followed by Ontario then Newfoundland and Labrador. Nunavut remained the fastest growing territory.

Table 12
Revision to the growth in real gross domestic product by province and territory

Province or territory	Revised estimate of the average growth in real gross domestic product (1982 to 2013)	Previously published estimate of the average growth in real gross domestic product (1982 to 2013)	Average absolute revision to real gross domestic product
	percent		
Newfoundland and Labrador	2.59	2.64	0.32
Prince Edward Island	2.47	2.50	0.56
Nova Scotia	1.95	1.95	0.25
New Brunswick	2.03	2.01	0.23
Quebec	1.93	1.95	0.19
Ontario	2.59	2.62	0.15
Manitoba	2.11	2.10	0.17
Saskatchewan	2.18	2.28	0.30
Alberta	3.13	3.14	0.36
British Columbia	2.47	2.48	0.17
Yukon	3.75	3.69	0.64
Northwest Territories ¹	2.51	2.58	0.54
Nunavut ¹	4.92	4.68	1.47

1 (1999 to 2013)

Source: Statistics Canada

The relative size of the provincial economies did not change with this revision. Ontario remained the largest province, accounting for an average of 39.4% of the total national gross domestic product. This was followed by Quebec and then Alberta. The relative size of the provinces and territories remained unchanged in 2013, with Ontario accounting for the largest

share of national gross domestic product followed by Quebec, with Alberta a close third.

Table 13
Average size of the provincial and territorial economies relative to the national total

Province or territory	Revised average share of national gross domestic product (1981 to 2013)	Previously published average share of national gross domestic product (1981 to 2013)	Revised share of national gross domestic product (2013)	Previously published share of national gross domestic product (2013)
	percent			
Newfoundland and Labrador	1.5	1.5	1.8	1.9
Prince Edward Island	0.3	0.3	0.3	0.3
Nova Scotia	2.3	2.3	2.0	2.1
New Brunswick	1.9	1.9	1.7	1.7
Quebec	20.8	20.8	19.1	19.2
Ontario	39.4	39.2	36.6	36.8
Manitoba	3.3	3.3	3.3	3.2
Saskatchewan	3.5	3.5	4.4	4.4
Alberta	14.4	14.3	18.2	17.9
British Columbia	12.3	12.2	12.0	12.1
Yukon	0.1	0.1	0.1	0.1
Northwest Territories ¹	0.4	0.4	0.2	0.2
Nunavut ¹	0.1	0.1	0.1	0.1

1 (1999 to 2013)

Source: Statistics Canada

The majority of the revision to the provincial and territorial gross domestic product was due to the incorporation of revised estimates of government revenues and expenditures. The methodology, accounting and data sources used to compile the government revenues and expenditures by province and territory were improved significantly with this revision to the Provincial and Territorial Economic Accounts. Previous estimates of provincial general government revenues and expenditures were sourced from annual aggregate public account documents. With this revision, the estimates of government revenue and expenditures have been constructed from provincial government general ledger files. This improved data source permitted improved coding, coverage and classification of government revenues and expenditures, according to the latest international accounting standards.

Table 14
Average absolute revision to the level of general government final consumption expenditure as a share of the average absolute revision in the level of gross domestic product

Province or territory	Average absolute revision to the level of general government final consumption expenditure (1981 to 2013)	Average absolute revision to the level of gross domestic product (1981 to 2013)	General government share of total revision
	millions of dollars		percent
Newfoundland and Labrador	140	140	1.00
Prince Edward Island	30	19	1.60
Nova Scotia	171	141	1.22
New Brunswick	138	133	1.04
Quebec	823	508	1.62
Ontario	1725	2017	0.86

Manitoba	117	244	0.48
Saskatchewan	238	132	1.80
Alberta	271	1015	0.27
British Columbia	389	609	0.64
Yukon	16	15	1.10
Northwest Territories ¹	29	29	1.00
Nunavut ¹	28	23	1.24

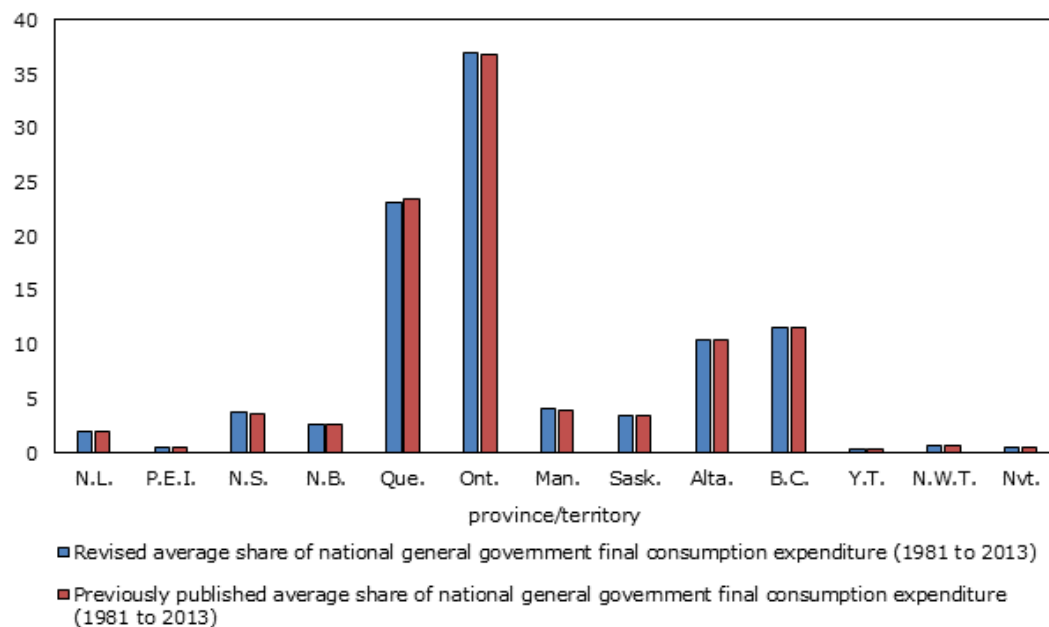
1 (1999 to 2013)

Source: Statistics Canada

In many cases the average absolute revision to general government final consumption expenditure is as large, or larger, than the average absolute revision to the level of gross domestic product for the provinces and territories. Revisions to general government final consumption expenditure were particularly large in Saskatchewan and Quebec. Revisions were more muted in Alberta and Manitoba.

Chart 23
National share of general government final consumption expenditure by province and territory

provincial/territorial
 general government
 final consumption
 expenditure as a
 percent of the
 national total



Source: Statistics Canada.

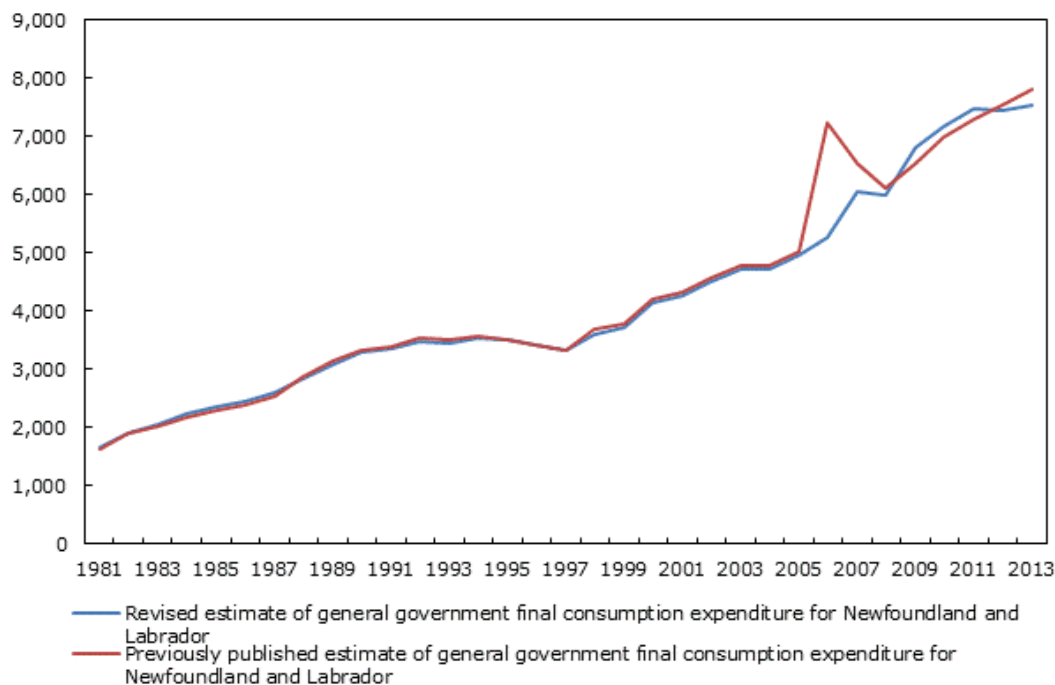
Each province and territory's share of total national general government final consumption expenditure was virtually unchanged with the 2015 comprehensive revision.

The revised treatment of defined benefit pension plans had an impact on the general government final consumption expenditure time series. Pension payments by governments are now recorded on an entitlement basis rather than on a cash basis. This served to smooth out the general government final consumption expenditure time series for a number of provinces. The following chart shows the previously published general government final consumption expenditure series and the revised series for the provinces of Newfoundland and Labrador and Nova Scotia. In both provinces, large payments to

the public sector pension fund were made in the mid-2000s. In the past, these transactions were recorded when the payment was made. In the revised set of accounts, the payments are recorded when the provincial employees earned their pension entitlements.

Chart 24
General government final consumption expenditure -
Newfoundland and Labrador

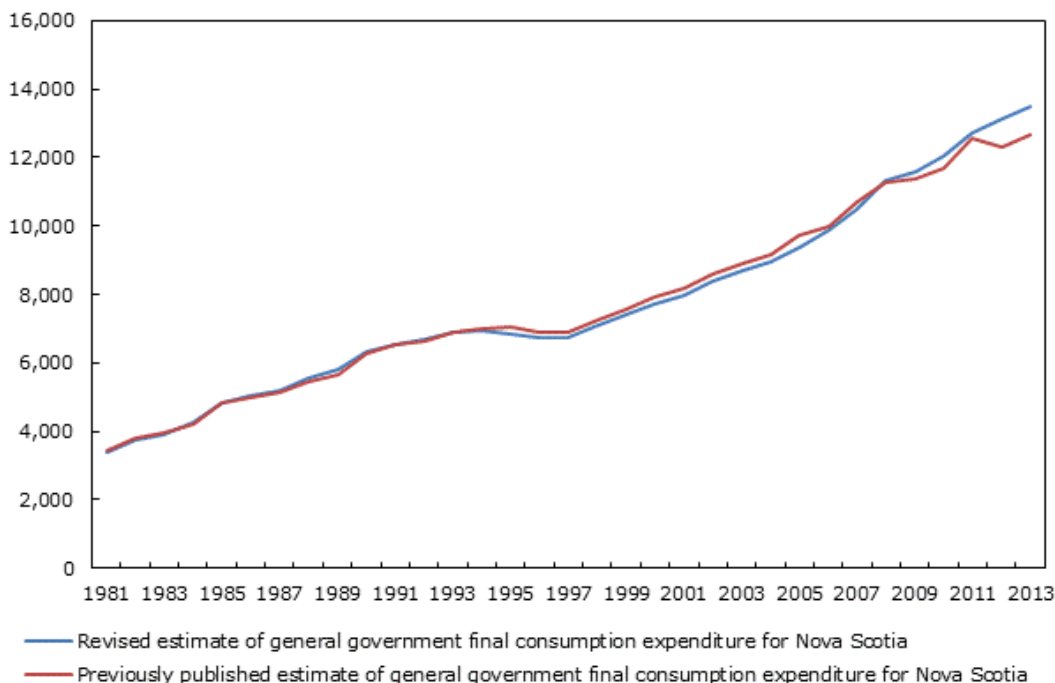
millions of dollars



Source: Statistics Canada.

Chart 25
General government final consumption expenditure - Nova Scotia

millions of dollars



Source: Statistics Canada.

Household disposable income by province and territory was revised downward for all provinces and territories as part of this comprehensive revision. The downward revision was due to the change in the treatment of pensions in the provincial and territorial economic accounts. Within the provincial and territorial accounts' household sector table, household payments to pension plans are now shown explicitly as a transfer to financial corporations. This flow represents the pension entitlements earned by households during the period, and which are placed into a pension fund. Similarly, pension funds received by households (pensioners) are shown as a transfer received from the pension fund. On average, the pension payments (transfers to financial corporations) are greater than the pension receipts (transfers from financial corporations) resulting in a downward revision to household disposable income for all provinces and territories. This new treatment aligns with the international standard on recording household disposable income.

Table 15
Revision to the level of household disposable income by province and territory

Province or territory	Revised estimate of the average level of household disposable income (1981 to 2013)	Previously published estimate of the average level of household disposable income (1981 to 2013)	Revised estimate of the average level of household disposable income (1981 to 2013) as a share of the previously published estimate
	millions of dollars		percent
Newfoundland and Labrador	8,112	8,631	93.99
Prince Edward Island	2,079	2,233	93.10
Nova Scotia	14,684	16,030	91.60
New Brunswick	11,477	12,296	93.34
Quebec	119,325	126,529	94.31
Ontario	222,454	232,836	95.54
Manitoba	18,995	20,223	93.93
Saskatchewan	17,083	17,839	95.76
Alberta	66,857	69,148	96.69
British Columbia	72,837	76,234	95.54
Yukon	685	737	92.94
Northwest Territories ¹	1,344	1,409	95.39
Nunavut ¹	740	782	94.63

1 (1999 to 2013)

Source: Statistics Canada

While disposable income was revised downward, there was little impact on the saving rate by province and territory. This is because a new flow has been added to the provincial and territorial household sector account, after the calculation of household disposable income, called the 'change in pension entitlements'. This new flow represents the difference between what households pay into pension funds and what they receive. The reason this difference is added back into the household sector's account is because, although the pension fund received the income from households, the income does represent a pre-determined source of saving for households and therefore needs to be included in the measure of household saving. Why is this income not included in disposable income? One way to answer this is by examining the definition of household disposable income. Household disposable income represents the income available to households to use for consuming or saving. If we include the 'pension' saving in household disposable income, we would be overstating their available funds for consumption since these funds have already been set aside as saving.

9. Conclusion

With the 2015 comprehensive revision of the Canadian System of Macroeconomic Accounts, Statistics Canada has taken another step towards fuller compliance with the international macroeconomic accounting standard—the 2008 System of National Accounts and has updated a number of underlying methodologies and data sources, improving the quality and

detail available for the user community. As is the case in other G20 countries, improvements can still be made to fully align Canada's macroeconomic accounts with recommended standards and ensure comparability in an evolving global economy. As such, Statistics Canada is considering further improvements targeted for publication in 2018. Planned changes will be communicated in advance to allow time for adjustment to economic models and analysis. These more frequent updates ensure that the Canadian System of Macroeconomic accounts continues to reflect the ever-changing Canadian and International economic environment.