

A horizontal teal bar with a white circular icon containing a smaller teal circle.

Preview of 2014 national accounts improvements



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1 Purpose and summary

Purpose

This paper reports on improvements to New Zealand's national accounts which will occur in 2014. It provides information and analysis to help interpret revised data and indicates the size of revisions expected.

Background to the improvements

In June 2013 we released [Improving New Zealand's macro-economic accounts: Methodological and conceptual reviews](#), which described planned improvements in 2014 to the macroeconomic accounts. The macroeconomic accounts include New Zealand's national accounts and balance of payments.

The two main aspects of these improvements are:

- implementing the updated international standards
- updating the lower-level price weights used for volume measurements.

These improvements will meet our economy's changing information needs, lead to improved relevance, and maintain international comparability. The updated macroeconomic statistics will also take account of changes in the structure of New Zealand's economy.

International standards

Our country's national accounts and balance of payments are based on international standards agreed to, published, and promoted by international statistical agencies such as the United Nations, International Monetary Fund, World Bank, OECD, and Eurostat. Periodically the standards are revised to reflect responses to changes that emerge within global economies. Two recent updates are:

- System of National Accounts 2008
- Balance of Payments and International Investment Position Manual (6th edition).

There are strong links between these two publications. They have consistent definitions, concepts, principles, and recommended methods for producing statistics. In our increasingly globalised economy a highly integrated and harmonised set of macroeconomic accounts is needed for effective policy responses to economic challenges.

Price weights

Price weights are used to aggregate GDP volume series. For example, the contributions to GDP by various types of farming are weighted to measure GDP for all agriculture industries. The price weights, in combination with volume data, reflect the importance of each low-level industry.

The key price weights used to aggregate the national accounts volume measures are updated annually when we produce the chain-volume series. However, for some lower-level series the price weights are not updated annually. We are carrying out an extensive update of these lower-level price weights, termed a rebase, which is required to fully reflect changes to the structure of New Zealand's economy.

When the improvements will occur

These improvements will be included in the national accounts for the first time in the following information releases:

Table 1
Upcoming releases reflecting the improvements

Publication title	Publication date
<i>National Accounts (Industry Benchmarks): Year ended March 2012</i>	21 November 2014
<i>National Accounts (Income and Expenditure): Year ended March 2014</i>	21 November 2014
<i>Gross Domestic Product: September 2014 quarter</i>	18 December 2014

[See Preview of 2014 balance of payments improvements](#) for the effects of the improvements on the balance of payments.

These improvements will be reflected in *Balance of Payments and International Investment Position: June 2014 quarter* information release, to be published on 17 September 2014.

Structure of the paper

The main analysis in this paper focuses on implementing the international standards and price weights. However, in total there are four reasons contributing to the improvements in 2014:

- implementing international standards
- other improvements and corrections associated with implementing international standards
- regular annual updates
- impact on volume growth rates from updated price weights.

Table 2
Improvements summary and analysis in this paper

	Annual National Accounts - Improvements to nominal GDP and national saving	Quarterly National Accounts - Improvements to measurements of GDP volume growth rates	Which periods will these updates impact ?
What are the improvements from updated international standards?	<p>1) Improved measurements of investment in assets, recognising emerging aspects of intellectual property, military expenditure, ownership transfer costs and land improvements.</p> <p>2) Improved economic reflection of financial sector activity, including updates for certain pension funds and measurement of non-life insurance services.</p> <p>3) Improved reflection of globalised operations, such as cross border manufacturing or merchanting operations.</p> <p>These improvements are described in more detail in section 3 of this paper.</p>	<p>The international standards improvements, associated updates, and regular annual updates will be reflected in the Quarterly National Accounts through updated annual benchmarks. The Gross Domestic Product:September 2014 quarter release will also incorporate the latest quarterly price and volume data.</p>	All March years published from 1972, and all quarters published from Q2 1986. A summary of the impacts expected are provided in section 2 of this paper.
What are the improvements from other updates associated with international standards?	<p>1) Other improvements and corrections to measuring non-life insurance.</p> <p>2) Improvements and corrections to measuring capital stocks and depreciation.</p> <p>These improvements are described in more detail in section 4 of this paper.</p>		All March years published from 1972, and all quarters published from Q2 1986.
What are the the improvements from regular annual updates?	<p>The regular annual update process includes annual balancing of industry benchmarks and new annual data used to measure income and expenditure. The impact of the regular updates are yet to be determined.</p> <p>More detail of these updates will be provided with the National Accounts release on Novemeber 21st 2014.</p>		All March years published from 2011, and all quarters published from Q2 2010.
What are the improvements from updated price weights?	<p>Price weights are used for measuring GDP volumes and have no economic relationship with nominal GDP or saving.</p>		<p>This improvement involves a more extensive update of prices weights than usually occur annually. The updated price weights used are more relevant and are updated to lower levels.</p> <p>These improvements are described in more detail in section 5 of this paper.</p>

Section 6 provides an international comparison of the total impact of the improvements on nominal GDP levels. The final section 7 outlines some future plans for improvements related to those we're making in 2014.

2 Effect on the annual and quarterly national accounts

This section explains how we expect the improvements to affect both the annual and quarterly accounts, including net saving.

We release the annual national accounts in two parts. The National Accounts (Industry Benchmarks) release provides comprehensive industry data on production, investment, and capital stock. It focuses on industry data and the benchmarks for the level of economic activity, which update and maintain the quality of quarterly GDP statistics.

The National Accounts (Income and Expenditure) release provides information on national income that is available for spending and saving. It provides an insight into how saving is used and invested between different sectors of the economy.

Effect of the improvements on annual nominal GDP

Updating New Zealand's national accounts to the latest international standards will increase the level of nominal GDP. This contributes an increase in nominal GDP levels of up to 1.4 percent between 2000 and 2011. We expect a similar increase due to the standards in the years after 2011.

The effect of the updated standards will be considerably less for the years before 2000. The GDP level rises 0.5 percent in 1972, with a gradual increasing effect until 1999. The gradual increase in the percentage means there will be no substantial change to year-on-year growth rates.

Table 3
Effect of updates on nominal GDP levels

Improvement	Period and effect of improvement		
	1972–99	2000–10	2011
International standard updates	Increased GDP levels (range: 0.5 to 1.2%)	Increased GDP levels (range: 1.2 to 1.4%)	
Other improvements and corrections	Reduced GDP levels (range: 0.1 to 0.2%)	Reduced GDP levels (range: less than 0.1 to 0.2%)	
Regular annual data updates	No effect		Yet to be determined. Revisions may be similar to the international standards updates, and in either direction
Updated price weights	No effect		
Total effect	Increased levels of GDP (range: 0.5 to 1.2%)	Increased levels of GDP (range: 1.1 to 1.4%)	Total revisions are potentially driven by regular annual updates

Effect of the improvements on annual net saving

Updating the national accounts to the latest international standards will contribute an increase to national net saving of up to 0.6 percent of gross national disposable income in all published years. The revisions to household net saving will be both positive and negative. However, over all published years there will be no substantial change to the economic picture regarding net saving.

Table 4
Effect of updates on net saving of New Zealand's economy and households

Improvement	Period and effect of update on net saving		
	1987–98	1999–2010	2011–13
International standard updates	Household net saving changes (range: -0.5 to +1.5% of household gross disposable income)	National net saving up (range: less than 0.1% to 0.6% of gross disposable income) Household net saving changes (range: -0.1 to +0.3%)	
Other improvements and corrections	Household net saving changes (range: -0.1% to +0.2% of household gross disposable income)	National net saving up (range: 0.1 to 0.8% of gross disposable income) Household net saving up (0.1 to 0.4%)	
Regular annual data updates	No effect		Yet to be determined. Revisions may be as for international standards updates, and in either direction
Updated price weights	No effect		
Total effect	Change in household net saving (range: -0.5 to 1.5% of gross disposable income)	National net saving up (range: 0.1 to 1.1% of gross disposable income) Household net saving changes (range: -0.1 to +0.6%)	Total revisions are potentially driven by regular annual updates

Effect on the quarterly GDP volume series

Quarterly GDP series will incorporate the international standards, associated updates, and the regular annual updates through new annual benchmarks. These updates, and more-relevant price weights, will have some effect on quarterly volume growth rates. We don't expect updates to the growth rates to change the previously published economic picture.

Table 5 provides an overview of all causes to revisions expected to the production measure of GDP, which is the official measure of economic growth. The expected growth rate changes are indicative at this stage and may vary slightly from the ranges in the table.

Table 5
Effect of updates on quarterly growth

Improvement	Period and effect of updating on quarterly growth		
	1987–2006	2007–10	2011–14
Standards, price weights, other methodological improvements	Small changes (-0.2 to +0.2%) due mainly to updating low-level weights from 1996 prices to a more-relevant year	Larger changes (-0.5 to +0.5%) due mainly to updating low-level weights from 1996 prices to a more-relevant year. More of the growth rate change due to methodology improvement occurs in these years	
Regular annual benchmark and other quarterly data updates	Small changes due to changed seasonal patterns		The effect of regular annual updates is yet to be determined.
Total effect	Small changes (-0.2 to +0.2%), almost all due to international standard and price weight updates	Larger changes (-0.5 to +0.5%), almost all due to international standard, price weight, and other methodology updates	Larger changes due mostly to regular annual updates; standard, price weight, and other methodology updates will contribute

Revisions to the expenditure measure of volume growth rates are potentially larger, due to more price weight updates and method improvements. We are yet to determine the size of these revisions.

Comparing the old and new volume series will show very noticeable changes in levels, which merely reflects a change in the prices used to express the volume series. We will now express the volume series in the average prices of the March 2010 year instead of the March 1996 year. Growth rates remain as the relevant measure of real economic activity. See section 5 for further details of the reasons behind this change in levels

3 Effect of the international standards

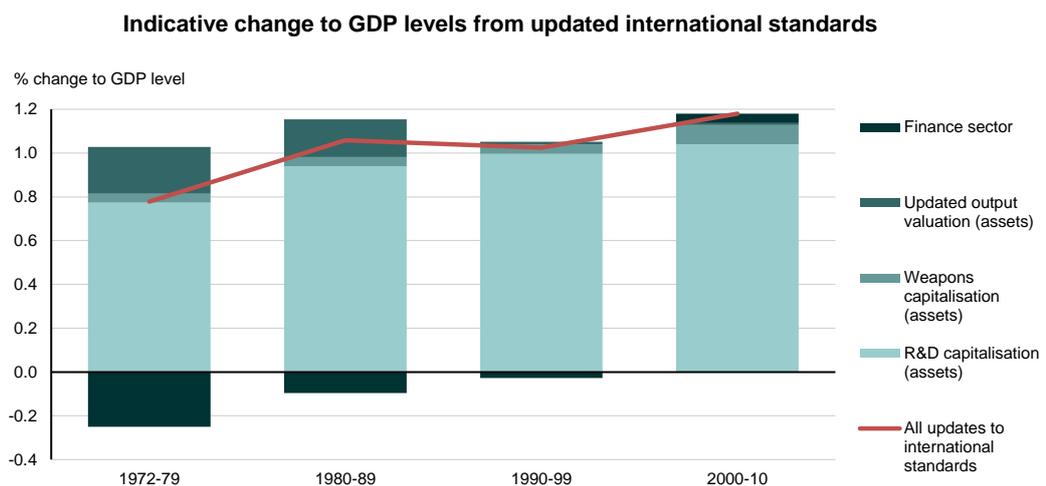
This section introduces the categories in the international standard updates and provides an overview of the changes in data and methods involved in implementing them within the national accounts.

The new features of the updated international standards that will affect New Zealand's macroeconomic accounts fall into three main categories:

- assets – including wider recognition of intellectual property
- the financial sector – responding to evolving financial markets
- globalisation and related issues – reflecting increased cross-border operations.

Figure 1 shows the components within these categories that contribute revisions to nominal GDP. To illustrate the emergence of economic factors, the effect is expressed as an average percentage change to GDP over a range of years.

Figure 1



Note: Globalisation and related issues have no impact on GDP

Source: Statistics New Zealand

Components contributing to GDP level and net saving

Capitalising research and development (R&D) has the largest effect on GDP. This update means we will treat R & D expenditure as an investment instead of an expense. An increasing percentage contribution to GDP reflects the emerging importance of R&D investment.

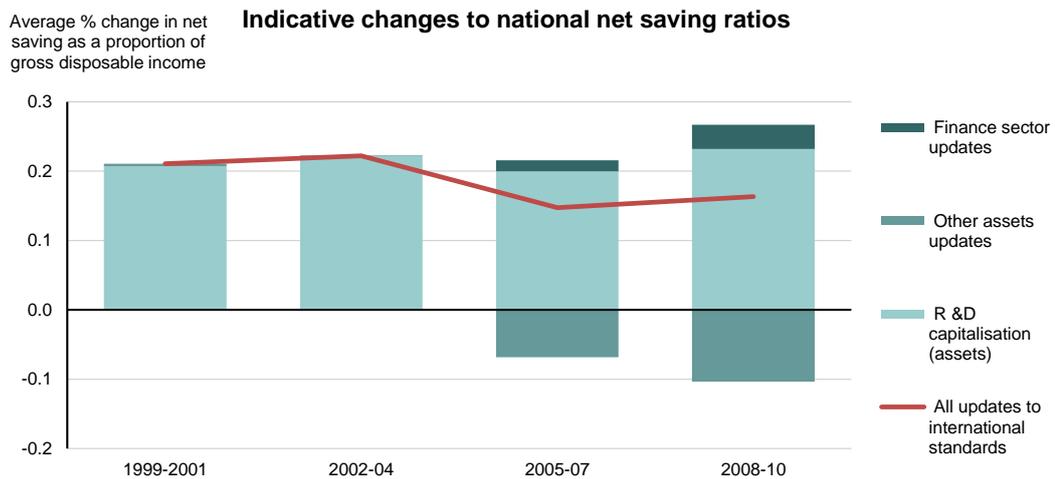
Expenditure on weapons systems, such as armed ships or fighter aircraft, also changes from being an expense to an investment. This update will increase GDP for every year, although by less than R&D.

The main effect within the other assets category is to better reflect the value of outputs by government agencies like the former Ministry of Works. In the 1970s and 1980s such agencies constructed assets like roads, schools, and hospitals on behalf of other parts of central and local government.

The revisions from financial sector updates are due to updated treatments of certain pension funds and the measurement of insurance service values. The larger revisions in the 1970s and 1980s are due to revised treatment of the Government Superannuation Fund. This fund was closed to new entrants in the early 1990s and therefore has less significant effect in later years.

Figure 2 shows the components that contribute revisions to national net saving. Their effect on net saving is expressed as an average proportion of gross disposable income over a range of years.

Figure 2



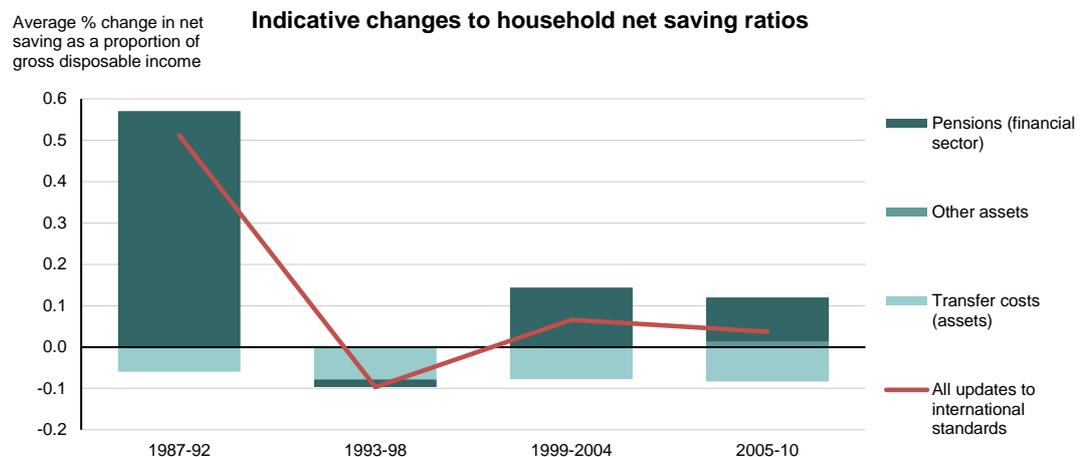
Note: Globalisation and related issues have no impact on net saving

Source: Statistics New Zealand

R&D capitalisation also consistently contributes the largest increase to national net saving over time, which reflects higher levels of resources being available for business and government investment. The downward effect from the other assets updates is mainly driven by changes in how we treat ownership transfer costs. The finance sector updates have only a small effect on national net saving, although these changes redistribute the net saving between the government, finance, and household sectors.

Figure 3 shows the components that contribute revisions to household net saving.

Figure 3



Source: Statistics New Zealand

The average effect of updated international standards on household net saving is very small after 1992. The largest effect is from updating treatment of the Government Superannuation Fund.

A new treatment of the ownership-transfer cost component of housing investment reduces household net saving. This update recognises that transfer costs are used over the expected ownership period rather than the whole service life of housing assets.

The remaining parts of this section provide an overview of the changes in data and methods as part of implementing the international standards within the national accounts. More detailed descriptions will be included in the publication of concepts, sources, and methods for the annual national accounts, which we plan to publish with the national accounts information releases in November.

Effect of the asset updates

The most substantive change to the international standards is that the asset boundary is expanded to include new types of assets. This better reflects that we are dealing with durable and intangible items that are not consumed but continue to provide a flow of capital services.

R&D capitalisation reflects wider recognition of intellectual property

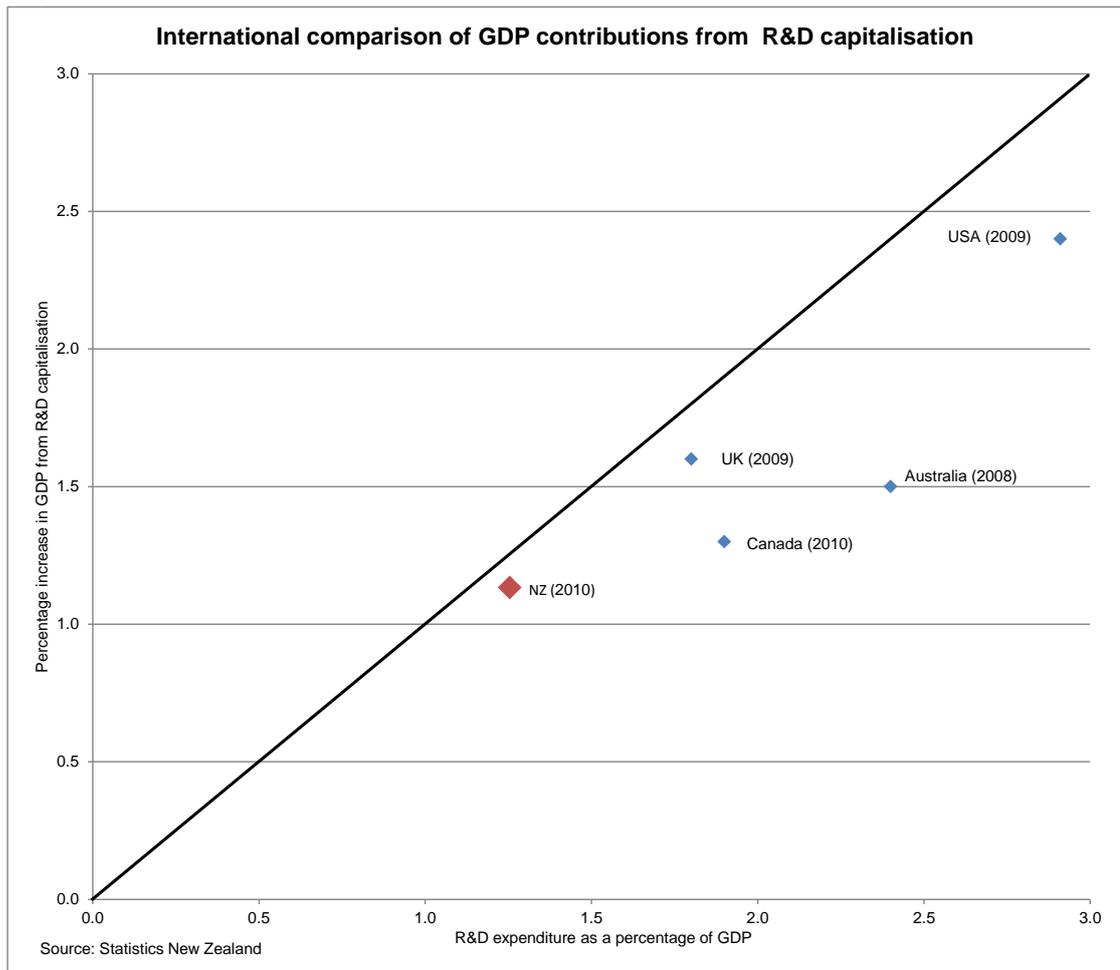
We will derive total R&D investment from the R&D expenditure values we currently publish (see [Research and development in New Zealand 2012](#)). These values include the costs of all inputs of labour, materials, and capital goods used in the R&D process. We make adjustments to expenditure to better reflect capital inputs, remove double counting of software development assets, account for R&D imports and exports, and correct historic undercoverage of private sector R&D.

R&D investment by businesses directly contributes an increase to GDP. As Crown research institutes and universities do not generally sell their output, the operational cost of these institutions is used to estimate the value of their output. The depreciation of accumulated R&D investments adds to their output and GDP contribution.

Countries that have implemented the latest international standards typically had increased GDP that was driven by R&D investment. The proportional increase in GDP attributable to this investment is closely related to R&D expenditure as a proportion of GDP.

Figure 4 compares this effect on New Zealand’s accounts with recently published information from Australia, United States, Canada, and the United Kingdom.

Figure 4



Capitalising R&D will also increase national income. This increased income will be partly offset by increased spending, through providing for depreciation. The combined effect will contribute increased net saving for business and government entities investing in R&D.

Weapons systems’ capitalisation recognises use over full-service life

Capitalising weapons systems will increase total GDP and net saving of the government sector. The effects are small, although this is in line with relatively low levels of military expenditure by the New Zealand Defence Force.

Other improvements to measuring asset value

The updated standards improve the output values of businesses by including capital inputs more extensively. The full cost of capital involves depreciation of assets used for production, and the cost of funding the investment in those assets, otherwise known as a net return to capital. When there is no sale or equivalent market price available, we value

business output as the sum of labour, material, and capital inputs to the production process. This occurs when enterprises produce goods and services for their own investment or consumption. An example of this is commercial amusement parks constructing unique attractions using their own labour and capital resources. These updated output estimates are more comparable to market prices, which do take account of the net return to capital.

We found that excluding a net return to capital caused significant understatement of output for certain local and central government agencies. These agencies produced goods and services mainly for other parts of government before 1988. The national accounts currently include output values for these agencies at the sum of labour, materials, and depreciation. Following the reforms of the mid 1980s, their activities were taken over by state-owned enterprises and local authority trading enterprises. These enterprises undertook these same activities, with contractual arrangements at a market price. The increased output values resulted in higher GDP and net saving levels in the 1970s and 1980s.

Small offsetting reductions to national net saving will result from changes to how ownership-transfer costs and classification of land improvements are treated.

Effect of the updates to the financial sector

The international standards were updated to reflect developments in one of the fastest changing segments of modern economies.

Improved measurement of household income from defined benefit pension schemes

The new standards allow a more complete picture of the income and distributions associated with defined benefit pension schemes. This type of scheme is where future benefits do not depend on how pension fund investments perform. The main improvement in the standard is that income and distributions are now consistent with the true liability of employers and household assets, regardless of how the scheme is funded.

In New Zealand, the updated standards affect only a limited number of pension schemes. Our investigations found that updating the standards only for the Government Superannuation Fund will make any significant difference to economic aggregates. Most schemes currently active in New Zealand are 'defined contribution schemes', where the beneficiaries bear the risk of the pension fund's volatile investment performance. The updated standards also do not apply to New Zealand National Superannuation – the standards classify this as social assistance.

Household net saving will increase in most years, from updating the income and distributions associated with the Government Superannuation Fund. The main driver to the increase in net saving is an upward revision to investment income earned by households. However, the upward revisions to household net saving will generally be matched by downward revisions to government and finance sector net saving.

The updated standards also change the output of central government, which will have a mainly downward effect on GDP for the 1970s and 1980s.

When comparing the impact of pension schemes on the macroeconomic accounts of other countries we need to take several other factors into account. Defined benefit pension schemes are more prevalent in some countries than here, and there are many variations in how pension schemes are structured.

Output of non-life insurance services better reflects long-term expectations

We will update non-life insurance output to better reflect long-term expectations of future claims and to deal with irregular or exceptional events. The small increases on GDP will largely reflect higher consumption of insurance services by households and the non-market sectors. There will be no impact on net saving.

Changes from globalisation and related issues

The updated standards reflect the emergence of cross-border manufacturing and merchanting operations. The updates implemented in the macroeconomic accounts in 2014 will result in a more consistent and comparable breakdown of trade activity, although have no effect on GDP or net saving.

[See Preview of 2014 balance of payments improvements](#) for more about globalisation standards and how they are implemented.



4 Other associated data and methodological updates

This section outlines two more reasons for updating data and methodology, other than changes in the international standards:

- method improvements and corrections to non-life insurance
- updates to calculating depreciation – including an update of price data and improvements and corrections to the calculation.

Improvements and corrections to measuring non-life insurance

As part of implementing the updated standards for measuring non-life insurance, we reviewed the current methods and processes to calculate the supply and use of insurance services. We found inconsistencies in the calculations currently used. Correcting these inconsistencies will result in small changes to GDP and the net saving of all sectors.

Improvements and corrections to measuring capital stocks and depreciation

Issues we identified while implementing the international standards have led to substantial downward revisions to depreciation and capital stocks. Those for depreciation will partly offset the additional depreciation from updating the international standards. In the latest years, the negative effect on capital stocks is greater than the overall increase in stocks from implementing the international standards.

Revised depreciation affects GDP through the changed contributions from government and the non-profit sectors. All other parts of the economy will also have revisions to depreciation, which flow through to net saving for households and other sectors.

The overall reduction in capital stocks will subsequently affect the industry productivity statistics. However, we are yet to determine the full effect.

5 How updated price weights affect quarterly national accounts

Updating the lower-level price weights used to combine GDP volume series is another major upgrade for New Zealand's national accounts. The effect of this update is discussed in this section.

Reasons for updating price weights within the volume measurements

Regular updating of the price weights used for measuring volume changes is considered to be international best practice. This update has two main effects on national accounts volume measures:

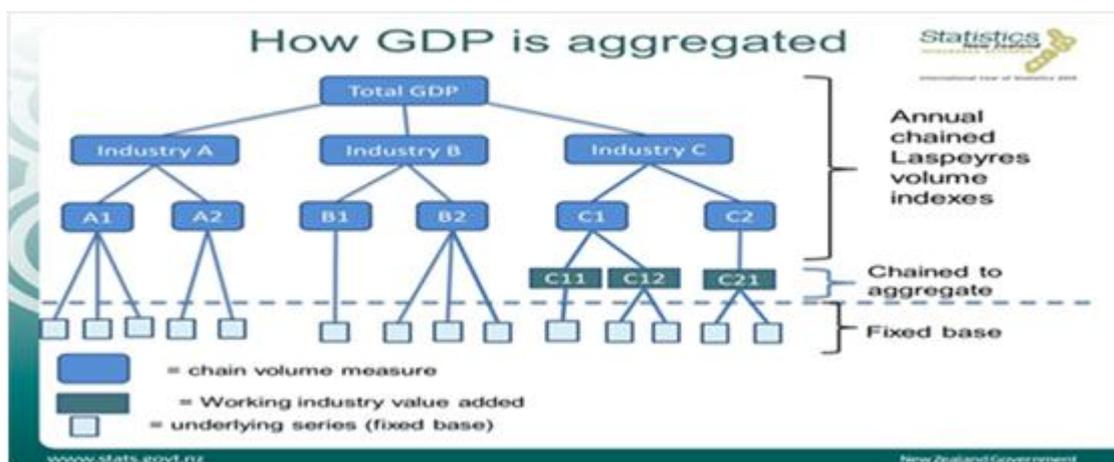
- Changed volume growth rates – from updating lower-level price weights to reflect the changing structure of New Zealand's economy.
- Changed levels – from expressing volume measures in the prices of a more recent year.

Updating lower-level price weights

When we update low-level price weights we will improve the relevance and coherence of the volume estimates, by incorporating structural changes to the economy into these estimates. This will result in small changes to growth rates.

For New Zealand's national accounts, updating of price weights happens annually through chain-linking to varying degrees. The stylised diagram within figure 5 highlights that some parts of the volume estimates are chain-linked at the lowest level while others are not. The decision to chain-link or not is primarily due to data availability. Where we do not chain-link at the lowest level, updating the price weights will alter growth rates.

Figure 5



As part of the update process we have removed existing fixed weights where possible. This will simplify future updates and result in smaller revisions.

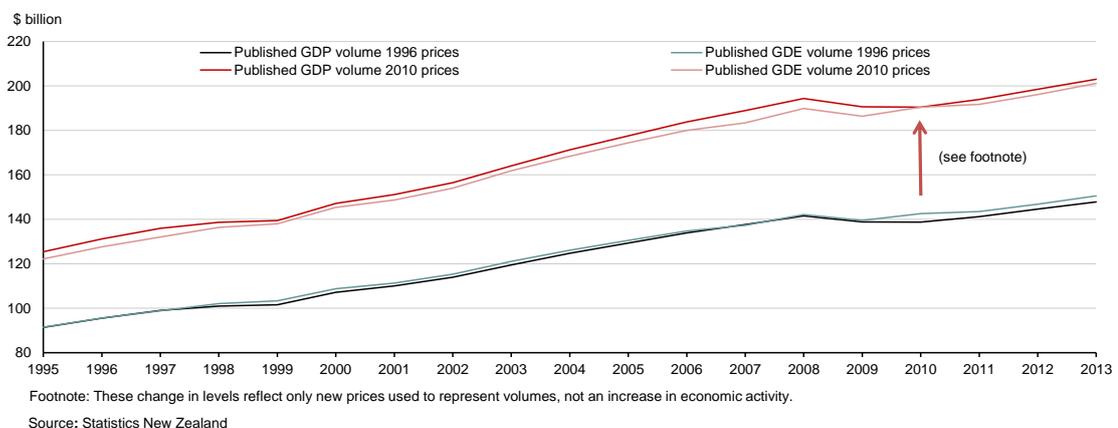
Changed levels result from an updated expression year

We currently express the chain-volume measures of GDP and gross domestic expenditure in the average March 1996 year prices. In the updated national accounts this changes to March 2010 year prices, a more-relevant year for expressing recent changes in economic activity. Re-expressing the volume measures will change the levels but will not in itself contribute any change to growth rates. The benefit of an updated reference year is that the relative sizes of the component series are closer to their actual contribution to economic growth, which will assist analysis of the volume series.

Figure 6 isolates the level change of the GDP volume series that is due only to re-expressing from 1996 prices to 2010 prices. These changes in levels do not signal anything about economic activity. The volume series are the basis of measuring growth only.

Figure 6

Expression of the currently published annual GDP volume series in 1996 prices and 2010 prices



The comparisons in figure 6 do not reflect any effect from the four 2014 improvements covered in this paper. However re-expression will be the major factor to take into account when comparing volume series. The appearance of wider gaps between the production and expenditure GDP series also has no economic significance – it only reflects the change in prices between 1996 and 2010.

Other methodological improvements included with price weight updates

Incorporating updated price weights also involved us reviewing methods for measuring some components of GDP volume measures. An example of the resulting improvements is to use more separate volume measures of an industry's output and input of goods and services. Using separate measures of input and output volumes is a better method when the data quality supports this. Where we could make improvements of this kind, further revisions to some quarterly movements will occur.

6 International comparison of nominal GDP impact

This section compares the impact that updated standards have on nominal GDP in different countries. Several factors need to be taken into account when making a comparison. As outlined in section 2, relative levels of R&D and military expenditure are key factors. And countries such as the UK have more defined benefit pension schemes.

It is common for countries to also make associated data and methodology improvements when updating international standards. In some cases the effect of the additional updates is considerably greater than that from the updated international standards.

The additional revisions reflect a multitude of factors specific to a country, such as data source improvements or policies to delay historic revisions for several years.

Table 6 compares the effect on GDP for recent years for New Zealand, Australia, the United Kingdom, and the United States.

Table 6
GDP level change due to updates in selected countries

Update type	Country and GDP level change (percent)			
	New Zealand (2010)	Australia (2008)	United Kingdom (2009)	United States (2009)
International standards	+1.3	+1.6	+2.3	+2.9
Associated updates	-0.1	+2.8	+2.3	+0.3
Total change	+1.2	+4.4	+4.6	+3.2

Note: See also [Summary of ESA10 and BPM6 changes on sector and financial accounts](#), for a 2014 breakdown of international comparisons from the Office of National Statistics in the UK.

Australia's associated updates are mainly data improvements for measuring financial and insurance services. The UK improved its data sources for measuring non-profit sector output and estimate illegal activities. Illegal activities are in the scope of the international standards as part of the non-observed economy. This is outlined within the context of the New Zealand economy in the following section.



7 Improvement plans after 2014

This final section outlines ongoing developments to the national accounts. These plans are related to the improvements made in 2014.

Non-observed economy

The non-observed economy describes activity that is not captured by standard measurement methods. There are several reasons for this, including illegal activity and deliberate or unintended understatement of legal activity. For example unrecorded maintenance services paid for as a cash job. By its very nature the non-observed economy is very difficult to measure and compare between countries.

Our previous internal investigations have assessed the effect on New Zealand's GDP would be small. One main reason for this assessment is that GST sales data provides a more extensive coverage of consumption than in other countries. As a result we make no explicit adjustment in New Zealand's national accounts for the non-observed economy. In coming years we plan to update our assessment of the non-observed economy.

Cultivated assets

Cultivation of some assets, such as plant or animal resources that produce repeating products, is treated as investment in the international standards. Dairy cattle producing milk is an example. At present, we treat dairy cattle and other livestock as inventories in the New Zealand accounts. Future developments that change this treatment would have very little effect on GDP, saving or productivity. The current treatment will continue in the 2014 national accounts due to data availability and quality issues. We will reassess this when it is feasible to develop appropriate data sources.

Institutional sector and asset classifications

The updated standards include changes to the classification criteria of institutional sectors, fixed assets, and financial instruments. We have used the updated classifications to the extent needed to implement the international standards within the macroeconomic accounts. We will carry out a more extensive review of these classification standards for future years.

Future improvements to the volume series

We use different data sources for the production and expenditure measures of GDP volumes. This means that quarterly movements do not always match. We address these differences for annual nominal values of GDP through balancing the supply and use of products in New Zealand. We don't currently have a suitable reconciliation method for volumes. However, we are working on developing a tool to do this and will release more information papers to provide details of how these developments may affect GDP volumes in future.