

Statistical bulletin

International Comparisons of Productivity - First Estimates: 2014

An international comparison of labour productivity across the G7 nations, in terms of levels of and growth in GDP per hour and GDP per worker.



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1. Main points

- First estimates for 2014 suggest that output per hour in the UK was 20 percentage points below the average for the rest of the major G7 advanced economies, the widest productivity gap since comparable estimates began in 1991
- On an output per worker basis, UK productivity was also 20 percentage points below the average for the rest of the G7 in 2014
- Across the G7 as a whole, productivity as measured by real (inflation adjusted) output per hour and output per worker grew modestly in 2014. Output per hour in the UK grew a little more slowly, and UK output per worker grew a little faster, than the G7 average
- Output per hour was lower in all G7 countries in 2014 than would have been the case if pre-downturn trends had continued since 2007. The UK's "productivity gap" of about 18% compares with a gap of about 7% for the rest of the G7
- First estimates in this release have been compiled before revisions to the UK National Accounts which will be published at the end of September. These and other revisions will be reflected in revised estimates which will be published in February 2016

2. About this release

This bulletin contains annual estimates of labour productivity for the G7 developed countries (Canada, France, Germany, Italy, Japan, UK and USA) up to 2014. Labour productivity measures the amount of economic output that is produced by a unit of labour input, and is a key measure of economic performance.

Output is measured by gross domestic product (GDP). Labour input is measured in two ways – by total hours worked and by numbers of workers in employment. These two measures of labour input can yield different results, reflecting differences in working patterns across countries and compositional movements over time, such as a shift towards part-time working.

Comparability across countries is achieved by using estimates of GDP and labour inputs from a common source (the Statistics Directorate of the OECD) as far as possible, and by converting local currency based measures of GDP using purchasing power parity (PPP) exchange rates. PPP exchange rates (usually referred to simply as PPPs) attempt to equalise the cost of a representative basket of goods and services in countries with different national currencies. An ONS article explaining the [uses and limitations of PPPs \(246.1 Kb Pdf\)](#) is available on our website.

The estimates in this release update those published on [20 February 2015](#). This release cycle reflects the publication and revision cycles of the component data series.

3. Interpreting these statistics

The labour productivity measures in this bulletin are presented in terms of **current prices**, suitable for cross-country comparison of levels of productivity for a single year, and **constant prices**, suitable for analysis of productivity performance over a number of years. The current price estimates in [Reference tables \(149.5 Kb Excel sheet\)](#) 1 and 2 should be read horizontally, while the constant price estimates in [Reference tables \(149.5 Kb Excel sheet\)](#) 3 and 4 should be read vertically. ¹

Current price productivity estimates are indexed spatially to UK=100 for each year and show each country's productivity relative to that of the UK in that year. Since productivity is a key determinant of living standards, these estimates also provide an indication of living standards relative to the UK.

In interpreting these estimates users should bear in mind that PPPs provide only an approximate conversion from national currencies and may not fully reflect national differences in the composition of a representative basket of goods and services. Additionally, care should be taken in interpreting movements in current price productivity estimates over time. For example, an increase in UK productivity relative to another country could be due to UK productivity growing faster, or falling less, or due to changes in relative prices in the two countries, or some combination of these movements.

Constant price productivity estimates are indexed to a particular year. For each single country, these estimates are almost identical to national labour productivity series (minor differences from national sources are described in the Background Notes to this bulletin). The index year is set at 2007 in order to focus on movements in labour productivity over the economic downturn.

Constant price productivity estimates show the evolution of productivity for each country and for the G7 (and G7 excluding the UK) aggregates, but should not be used to compare productivity across countries at a point in time. Productivity growth can be decomposed into growth of output minus the growth of labour input, and these components can move in different directions within and across countries. This should be borne in mind in interpreting the constant price productivity estimates in this release.

More information on methodology and interpretation is available in the Background Notes to this bulletin. Additionally, the [Quality and Methodology Information paper \(123.8 Kb Pdf\)](#) for this release provides information on the quality of the estimates in this release, as well as providing a summary of methods used in compiling the estimates.

Notes for interpreting these statistics

1. All data are also available in hard copy at the back of the PDF version of this statistical bulletin.

4. Current price productivity

Current price productivity estimates allow for comparison of how much economic output, measured in common currency terms, is produced by each worker and hour worked across countries in a particular year, relative to the UK=100. Further information is available in [Reference tables \(149.5 Kb Excel sheet\) 1 and 2](#).

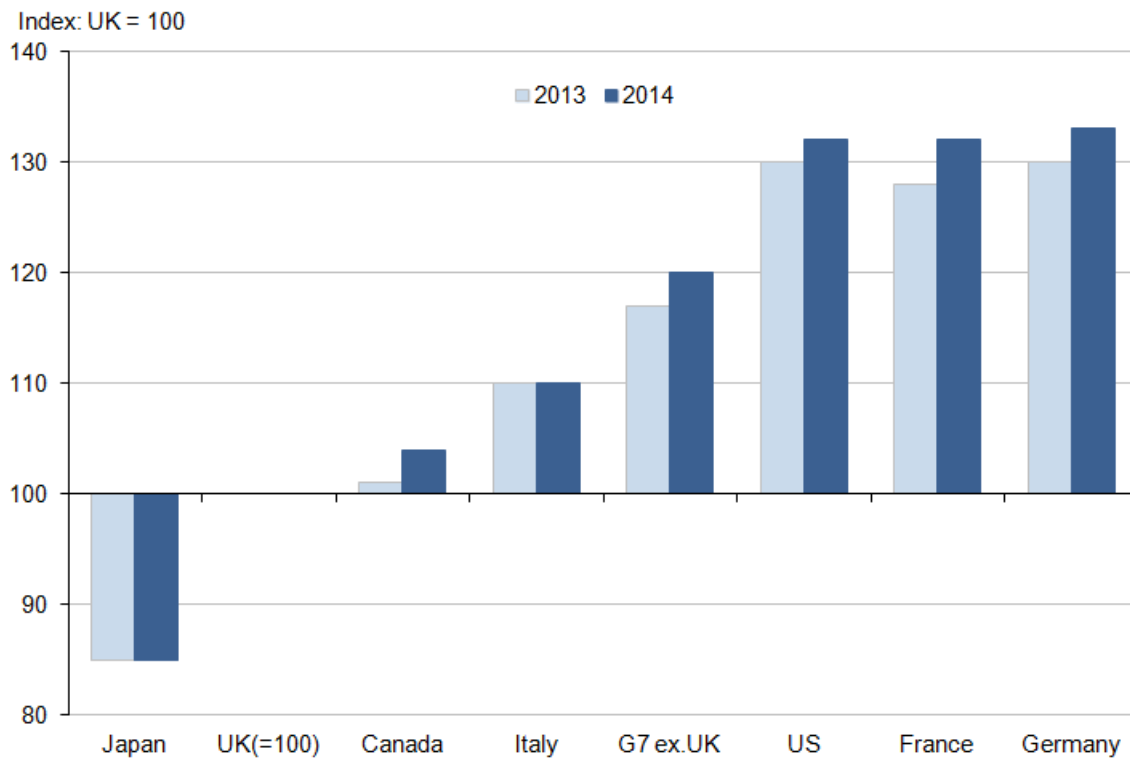
GDP per hour worked (Table 1)

On this basis, UK productivity in 2014 was:

- above that of Japan by 15 percentage points
- lower than that of Canada by 4 percentage points
- lower than that of Italy by 10 percentage points
- lower than that of France, Germany and the US by 32-33 percentage points, and
- lower than that of the rest of the G7 by 20 percentage points.

Figure 1: GDP per hour worked, G7 countries

Index: UK=100



Source: Office for National Statistics

Comparing 2014 with 2013, the UK productivity shortfalls relative to Canada, Germany, France and the US all widened. UK output per hour relative to Japan to Italy was unchanged in 2014, and the UK's shortfall relative to the rest of the G7 countries as a whole widened by 3 percentage points to the largest shortfall since records began in 1991.

As noted below, UK output per hour grew only a little less than the weighted average for the rest of the G7 in 2014. It follows that most of the 3 percentage point change in relative productivity between 2013 and 2014 reflects a change in PPPs, and specifically a drop in the price of UK GDP relative to the rest of the G7.

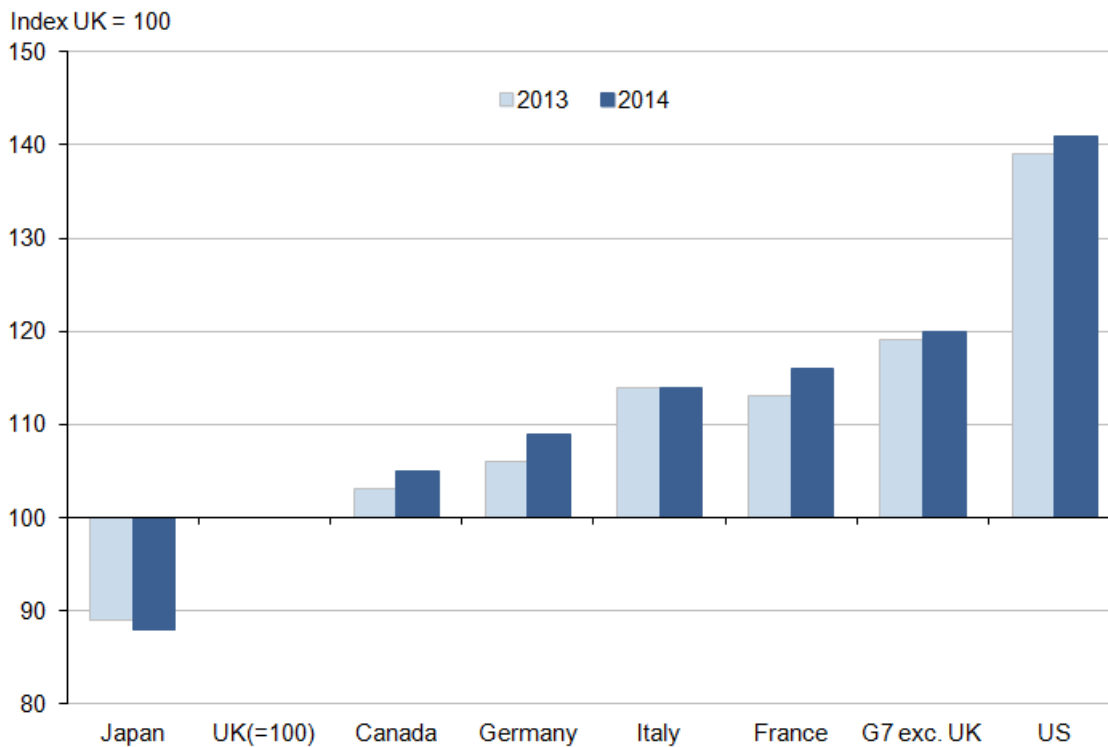
GDP per worker (Table 2)

First estimates for 2014 show that UK output per worker was:

- above that of Japan by 12 percentage points
- below that of Canada and Germany by 5 and 9 percentage points respectively
- below that of Italy and France by 14 and 16 percentage points respectively
- below that of the US by 41 percentage points, the largest differential since this series began in 1990, and
- below that of the rest of the G7 by 20 percentage points.

Figure 2: GDP per worker, G7 countries

Index UK=100

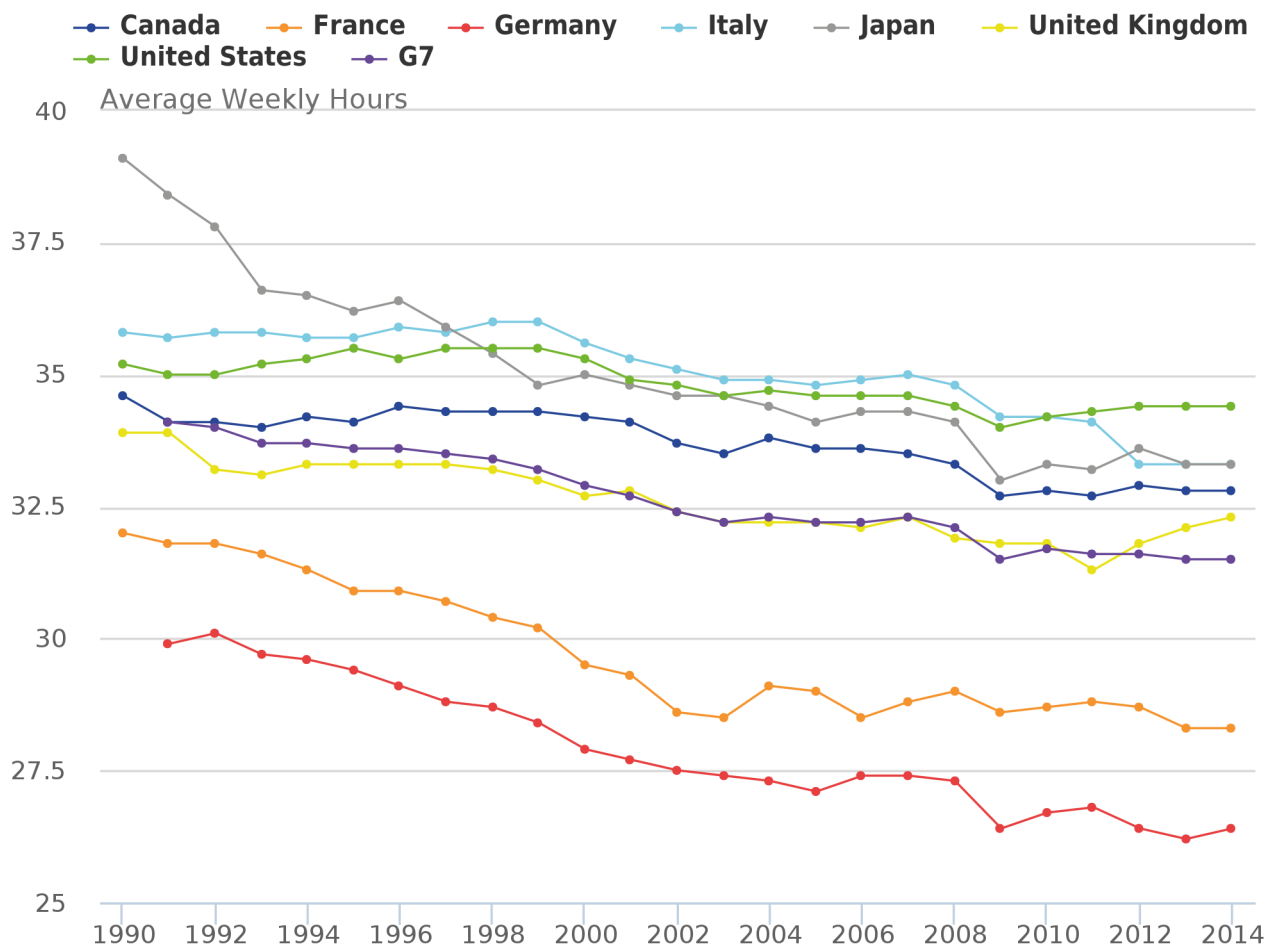


Source: Office for National Statistics

Comparing 2014 with 2013, UK productivity shortfalls increased by 3 percentage points relative to France and Germany, and by 2 percentage points relative to Canada and the US. UK productivity relative to Italy was unchanged, while the UK productivity margin over Japan increased by 1 percentage point.

As illustrated in Figure 3, there are significant differences in average weekly hours worked across the G7, reflecting cultural and compositional differences between economies. Different movements in average hours across countries account for differences in the patterns of productivity shown in Figures 1 and 2. For example, the productivity gap between the UK and the US is wider in terms of output per worker than in terms of output per hour because, on average, US workers work more hours than UK workers. On the other hand, the productivity differential between the UK and Germany is wider in terms of output per hour than in terms of output per worker, as German workers work fewer hours than their UK counterparts.

Figure 3: Average weekly hours per worker, G7 countries



Source: Office for National Statistics

Notes:

1. G7 average hours is unweighted

Generally there has been a trend across the G7 countries towards lower working hours, perhaps reflecting workers choosing more leisure time as productivity and living standards have increased over time. Figure 3 suggests that this trend has slowed or gone into reverse in a number of G7 countries, including the UK, since the economic downturn.

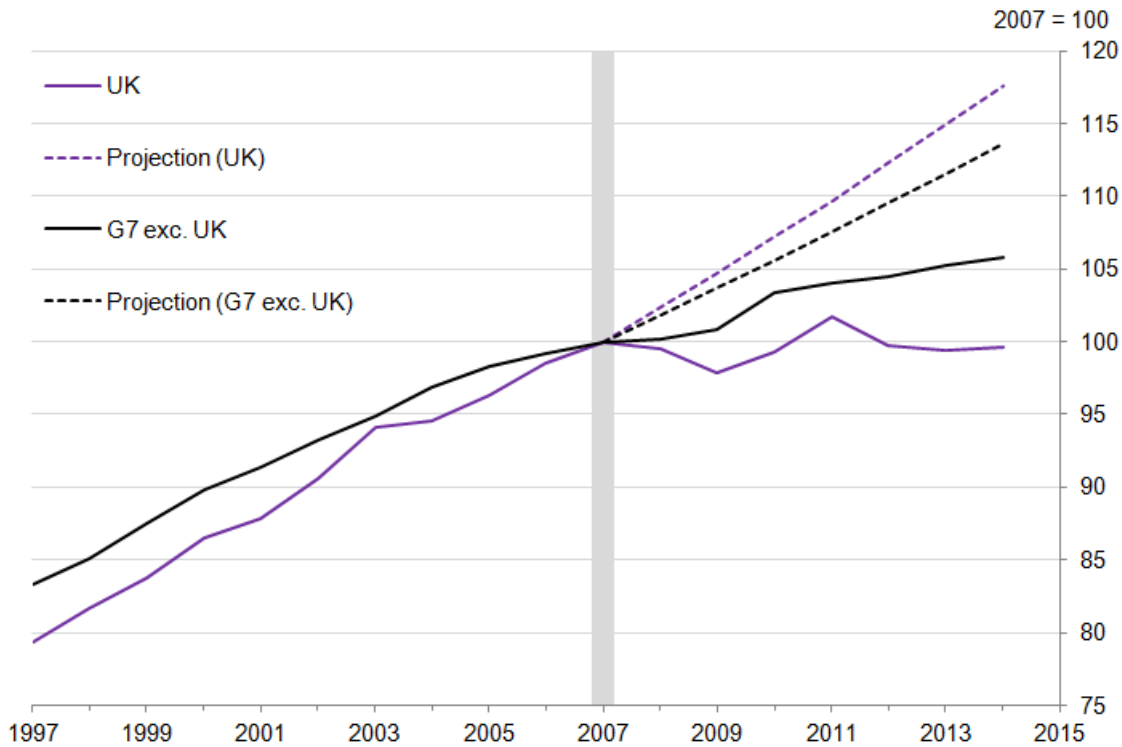
5. Constant price productivity

Constant price productivity estimates are indexed to 2007=100 and show the evolution of labour productivity for each country and group of countries over time. Further information is available in [Reference tables \(149.5 Kb Excel sheet\)](#) 3 and 4. The following commentary focuses on GDP per hour worked, which, by allowing for movements in average hours worked, provides a more comprehensive measure of movements in productivity than GDP per worker.

GDP per hour worked (Table 3)

Figure 4 shows GDP per hour worked for the UK and an aggregated series for the rest of the G7, together with simple projections based on average productivity growth over 1997-2007, that is, before the global economic downturn. On this basis, the combination of strong UK productivity growth up to 2007 and weak productivity performance since 2007 implies a productivity gap of around 18% in 2014. That is, under a counterfactual scenario where UK productivity had continued to grow at its pre-downturn trend since 2007, output per hour in 2014 would have been around 18% higher than was actually the case, and average living standards would have been commensurately higher too.

Figure 4: Constant price GDP per hour worked, actuals and projections

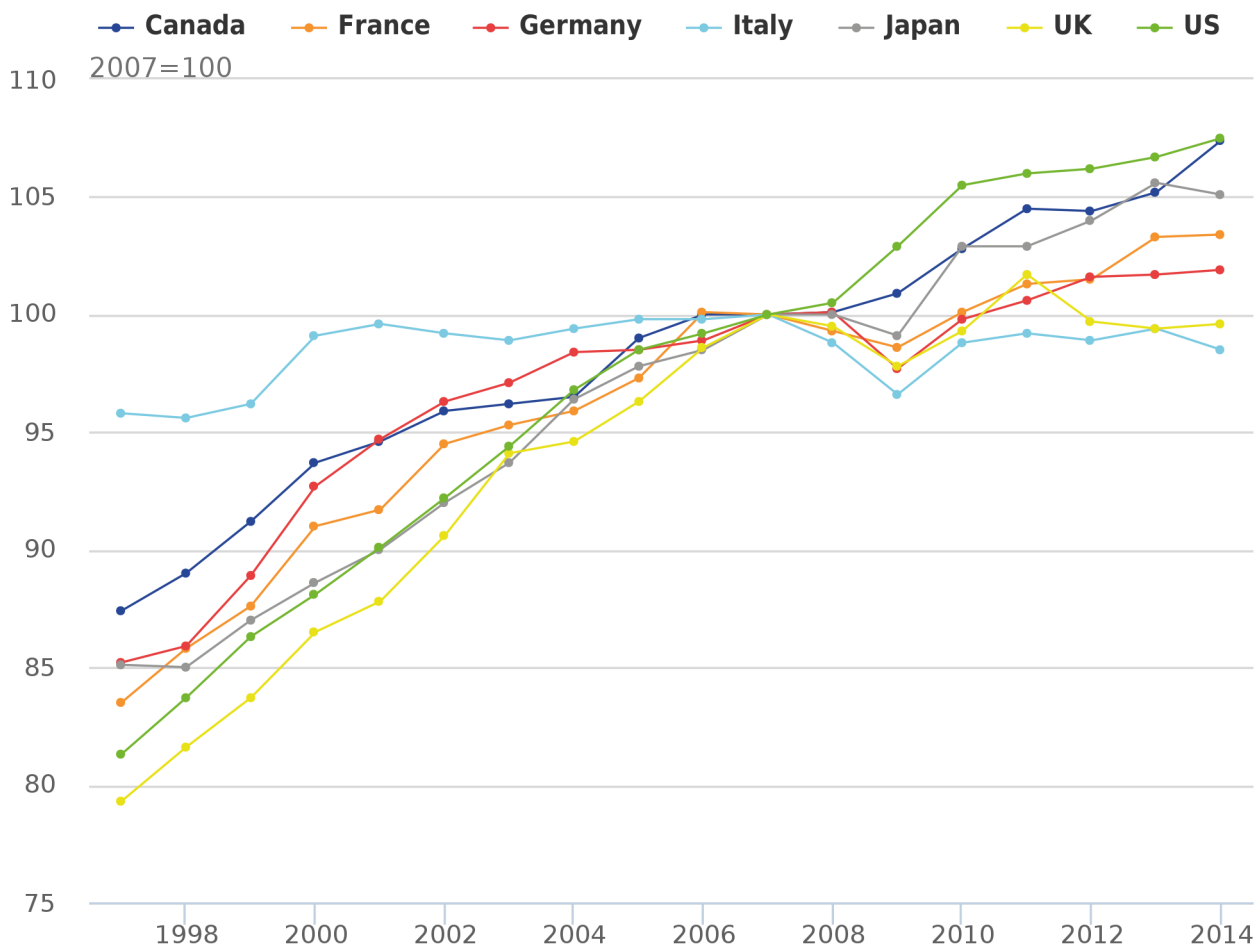


Source: Office for National Statistics

Average annual productivity growth between 1997 and 2007 for the rest of the G7 was lower than in the UK (around 1.8% per year, about 0.5% per year lower than average productivity growth in the UK). Since 2007, productivity growth across the rest of the G7 has been stronger. This implies a narrower productivity gap for the rest of the G7 of around 7% in 2014.

Figure 5 illustrates the difference in productivity trajectories over recent years between the main European economies on the one hand, and North America and Japan on the other hand. Output per hour fell in most countries during the downturn in 2008-09, before rebounding sharply in Japan, Canada and the US. By contrast, the recovery in productivity in Germany, France and especially Italy has been weaker.

Figure 5: Constant price GDP per hour worked, selected G7 countries



Source: Office for National Statistics

Converting the time series in Figure 5 into productivity gaps in 2014 relative to extrapolations of pre-downturn trends (as in Figure 4) would yield gaps of around 10% for Germany and France, around 7% for the US and Japan, around 5% for Italy and around 2% for Canada. The reason why the productivity gap for Italy is much narrower than that for the UK, despite a similarly weak trajectory since the economic downturn, is that the UK productivity trajectory prior to the downturn was much stronger than Italy's.

6. Revisions

Historical data used in this publication are subject to revision between publications. [Reference tables \(149.5 Kb Excel sheet\)](#) R1 to R4 compare the latest estimates with estimates from the previous release on 20 February 2015. Note that because Tables 1 and 2 are indexed to UK=100, revisions to the UK are zero by definition in Tables R1 and R2.

The main revisions are as follows:

- current and constant price GDP estimates for 2012 and 2013 have been revised for several countries, including the US (where the annual revision of the National Income and Product Accounts reduced GDP growth by 0.7% in 2013), Italy and Germany
- employment in Canada has been revised down from 2006, and
- average hours have been revised markedly lower in Germany, France and Italy.

We have published revisions to UK GDP in current and constant prices up to 2013. These revisions will be extended to 2014 in the Blue Book publication on 30 September 2015 and have not yet been incorporated in the OECD datasets which are the primary source of estimates in this release.

In addition, PPPs for 2014 used in this release are OECD estimates. These will be revised as part of the triennial benchmarking exercise that is currently underway.

7. Background notes

1. This Statistical Bulletin

We publish annual estimates of International Comparisons of Productivity twice a year. Initial estimates are published approximately nine months after the reference year, with final estimates published approximately five months later. Exact publication dates vary subject to the availability of the source datasets.

2. Quality and methodology

The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics.

Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs
- are well explained and readily accessible
- are produced according to sound methods
- are managed impartially and objectively in the public interest

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.

[A Quality and Methodology Information paper \(123.8 Kb Pdf\)](#) for this release was published on 20 July 2012, describing the intended uses of the statistics presented in this publication, their quality, and the sources and methods used to produce them. The paper also provides information on the uses and limitations of international comparisons of productivity.

For this release the base year for PPPs is 2011, which is the latest year for which the OECD PPP series have been benchmarked.

The output measure used here (GDP) differs from that used for the ONS headline measure of productivity (Gross Value Added (GVA)). In the National Accounts, GDP is valued at market prices and GVA is valued at basic prices. The principal difference is that basic prices exclude taxes and subsidies on products, such as VAT and excise duties. For further information on the relationship between GVA and GDP see Chapter 4 of the [ONS Productivity Handbook](#).

GVA is the preferred measure of output for productivity purposes. However, as the OECD does not produce output level series using basic prices over the necessary time period, and PPPs are based on market prices, GDP is used in this bulletin. Differences between growth rates of GVA and GDP are not normally significant.

Estimates of labour inputs (employment and hours worked) are taken from OECD where available, supplemented in a small number of cases by other sources. Differences between OECD estimates and national sources reflect adjustments made by OECD to achieve greater consistency between national estimates. There may also be timing differences as national sources are updated outside the OECD revision cycle.

3. Other data on productivity

We publish a quarterly [Labour Productivity statistical release](#), which provides much more detailed information regarding UK labour productivity than this ICP release. As noted above, our labour productivity estimates use

GVA rather than GDP as the numerator. Our measures of employment and average hours also differ slightly from OECD measures in terms of coverage, timing and seasonal adjustment.

We publish annual [Multi-factor productivity estimates](#) for the UK, which decompose output growth into contributions due to changes in labour and capital inputs, and a residual component reflecting 'disembodied technical change'.

We also publish a range of public sector [productivity measures and related articles](#). These measures define productivity differently from that employed in the ONS Labour Productivity and MFP estimates. Further information can be found in [Phelps \(2010\) \(252.5 Kb Pdf\)](#) and in [Gill and Kliesmentyte \(2015\)](#).

More information on the range of ONS productivity estimates can be found in the [ONS Productivity Handbook](#).

The [OECD](#) publishes its own estimates of current and constant price GDP per hour worked for member countries, the G7 and two other aggregates: the EU and OECD. The OECD current price estimates can easily be indexed to UK=100 and can then be compared with the estimates in [Reference table \(149.5 Kb Excel sheet\)](#) 1. While there are some differences between the two sets of estimates, the overall picture is very similar.

The OECD constant price estimates use a different base period to the estimates in Reference table (149.5 Kb Excel sheet) 3 and are best compared in terms of growth rates. Again, while the two sets of growth rates are not identical, the overall picture is very similar.

Differences between the estimates in this release and the OECD productivity series can be explained by the different sources used for the component data. In particular, our estimates use employment data that are based on countries' labour force surveys, whereas the OECD estimates use the National Accounts as the main source of employment data for most countries. There can also be differences in the GDP data due to timing, as the OECD productivity estimates use Annual National Accounts whereas we use the Quarterly National Accounts for GDP data.

International estimates of productivity are also available from Eurostat, and the Conference Board.

4. User engagement

We are keen to develop a greater understanding of the use made of ICP and other productivity statistics, and organises annual user group workshops. An information note on the latest Productivity Statistics User Group workshop is available here. If you would like to be kept informed of future workshops and other productivity related information please email Productivity@ons.gsi.gov.uk.

You can follow ONS on [Twitter](#) and [Facebook](#). This publication can be commented upon on social media using the hashtag #UKproductivity.

5. Publication policy

A list of the job titles of those given [pre-publication access](#) to the contents of this Statistical Bulletin is available on the website.

Details of the policy governing the release of new data are available by visiting www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html or from the Media Relations Office email: media.relations@ons.gsi.gov.uk These National Statistics are produced to high professional standards and released according to the arrangements approved by the UK Statistics Authority.