

Statistical bulletin

# International Comparisons of Productivity - First Estimates: 2012

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



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# 1. Key points

- Output per hour in the UK was 16 percentage points below the average for the rest of the major industrialised economies in 2012, the widest productivity gap since 1994. On an output per worker basis, UK productivity was 19 percentage points below the average for the rest of the G7 in 2012
- UK output per hour and output per worker fell in 2012 compared with 2011. By contrast, these measures both increased in 2012 on average across the rest of the G7
- In 2012 UK output per hour was 2 percentage points below its level in the pre-recession year of 2007, and 15 percentage points below the counterfactual level had productivity grown at its average rate before the recession
- This compares with a productivity gap in 2012 of around 5 percentage points for the rest of the G7

## 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 2012. Labour productivity is 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 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.

This release updates estimates to 2011 published on [13 February 2013](#) and provides first estimates for 2012. 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** and **constant prices**. Figures 1 and 2 (and Tables 1 and 2) use current prices and are suitable for comparisons across countries in a single year, so Tables 1 and 2 should be read horizontally. Figures 4 and 5 (and Tables 3 and 4) use **constant prices** and so are suitable for analysis of a country's productivity performance over a number of years, so Tables 3 and 4 should be read vertically.

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, further explained in the '[Productivity Handbook \(145.6 Kb Pdf\)](#)', 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 recession.

Constant price productivity estimates show the evolution of productivity for each country and for groups of countries, and show productivity levels relative to 2007. They 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 paper](#) for this release provides information on the quality of the estimates as well as providing a summary of methods used in compiling the estimates.

## 4. Current price productivity

Current price productivity estimates allow for comparison of how much economic output, measured in common price terms, is produced by each hour worked (Figure 1) and worker (Figure 2) across countries in a particular year, relative to the UK=100. Further information is available in Tables 1 and 2 in the [reference table \(143 Kb Excel sheet\)](#) component of this release and at the back of the PDF version of this statistical bulletin.

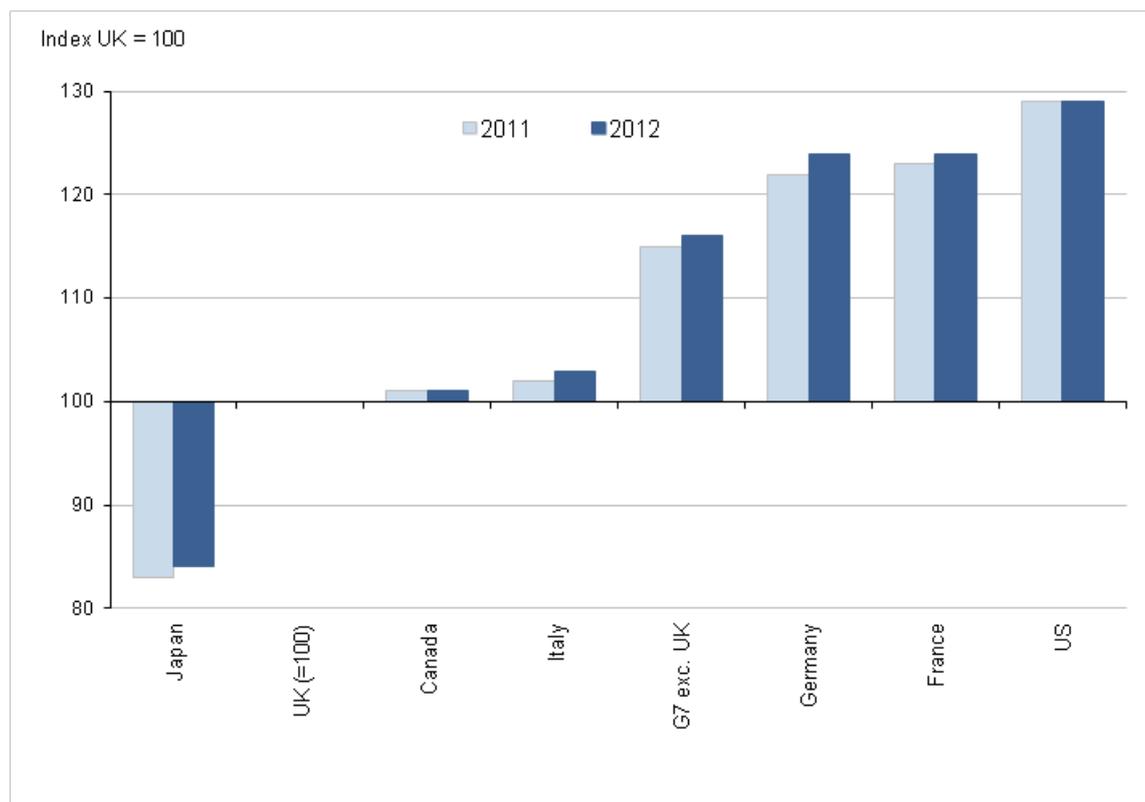
### GDP per hour worked

On this basis, UK productivity in 2012 was:

- Marginally below that of Canada and Italy
- Below that of Germany and France by 24 percentage points
- Below that of the US by 29 percentage points

However, Japanese GDP per hour worked was 16 percentage points below that of the UK.

**Figure 1: GDP per hour worked, G7 countries**



**Source: Office for National Statistics**

Comparing 2012 with 2011, the UK productivity shortfalls relative to Italy, Germany and France have widened, and the UK's lead over Japan has narrowed. The difference in productivity on this measure between the UK and the G7 excluding UK group widened to the greatest differential since 1994.

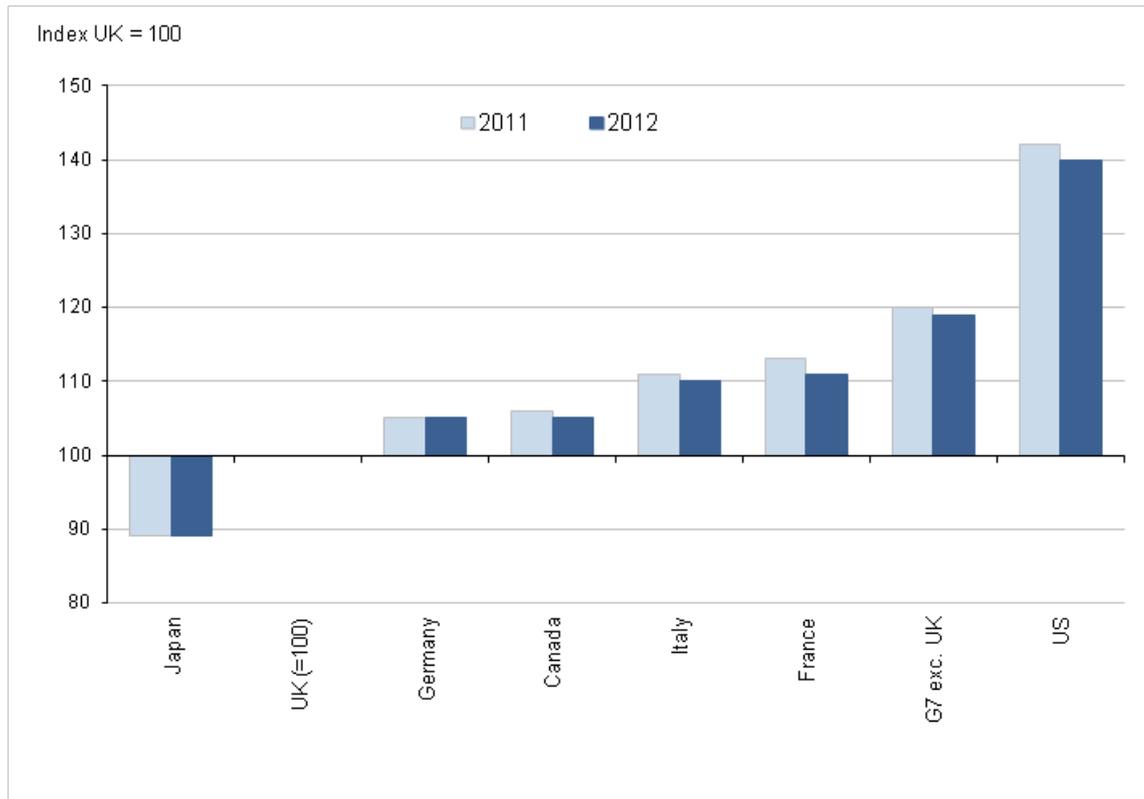
## GDP per worker

First estimates for 2012 show UK output per worker:

- Below that of Canada and Germany by 5 percentage points
- Below that of Italy and France by 10-11 percentage points
- Below that of the US by 40 percentage points

However, Japanese GDP per worker was 11 percentage points below that of the UK.

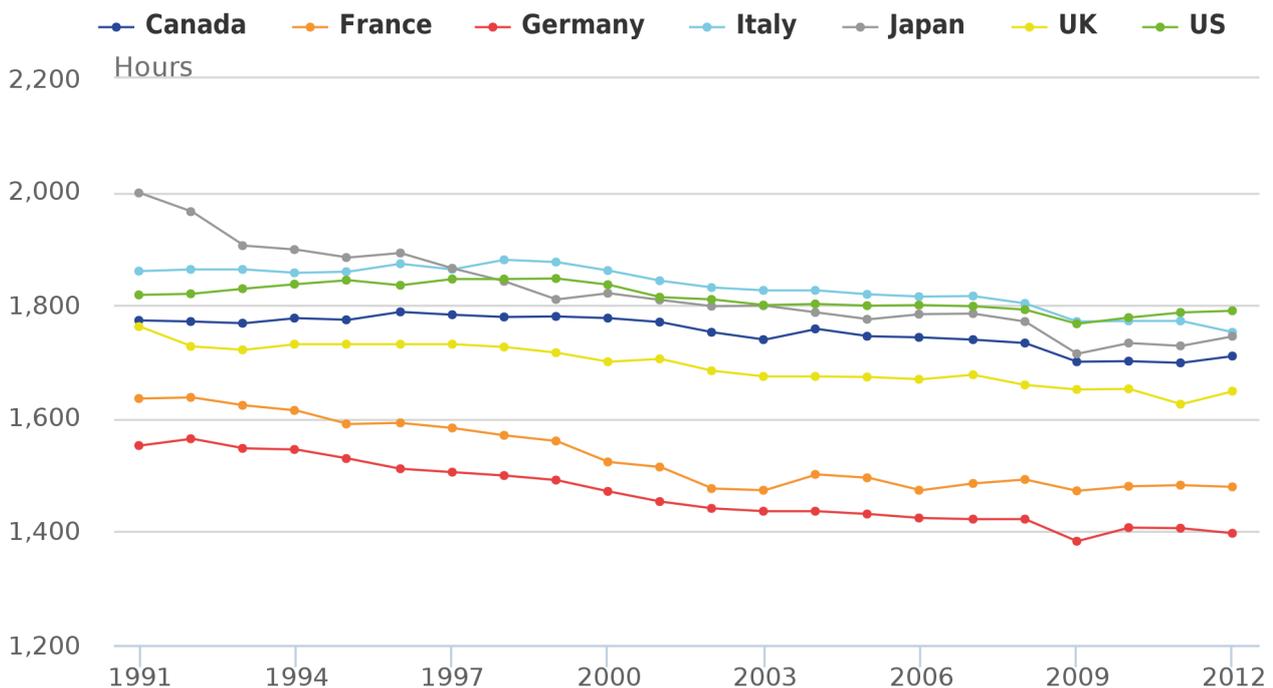
**Figure 2: GDP per worker, G7 countries**



Source: Office for National Statistics

Comparing 2012 with 2011, the shortfall between output per worker in the UK and the rest of the G7 narrowed slightly. Differences between Figures 1 and 2 reflect differences in average hours per worker across the G7, as shown in Figure 3.

**Figure 3: Average annual hours per worker, G7 countries**



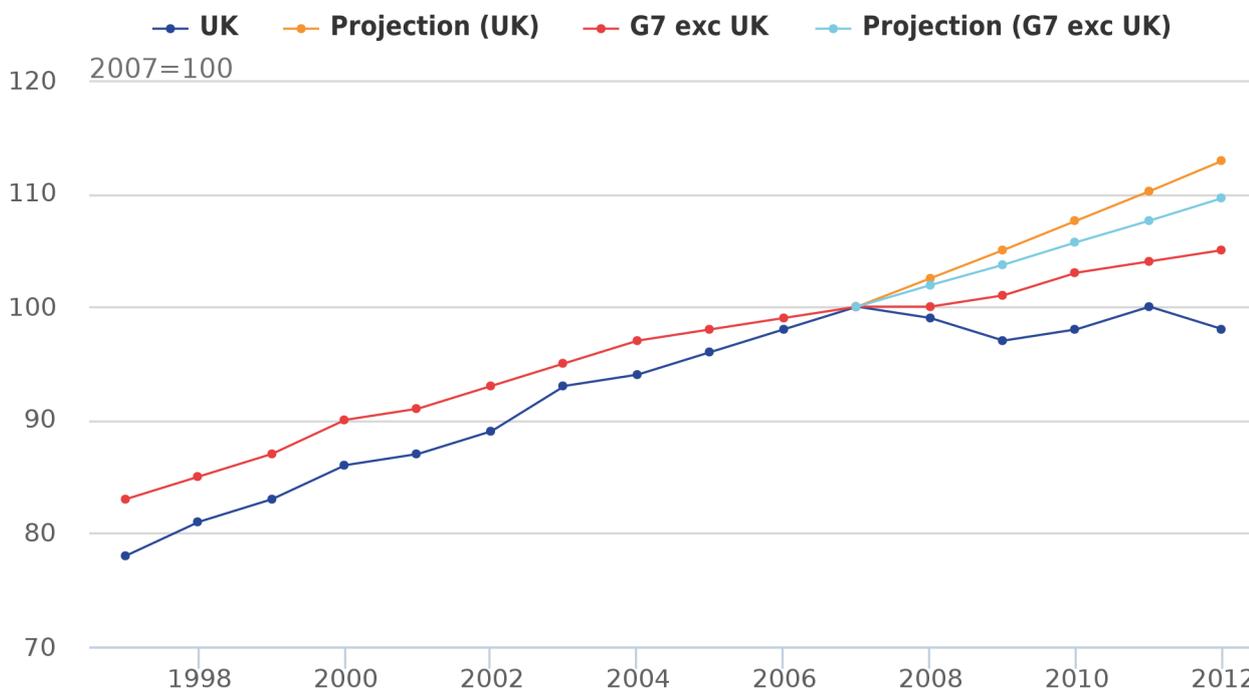
As illustrated in Figure 3, there are considerable differences in average hours worked across the G7, although the general long term trend is towards lower average hours. Differences between countries reflect cultural, legislative and compositional differences, for example between shares of full-time and part-time employment. Average hours in the UK are around the average of the G7, and have fallen less than in Japan, Germany and France. The difference in average hours in 2012 between the US (where average hours are highest among the G7) and Germany (lowest) is equivalent to a difference of around eight hours per week.

## 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 Tables 3 and 4 in the [reference table \(143 Kb Excel sheet\)](#) component of this release and at the back of the PDF version of this statistical bulletin.

Figure 4: GDP per hour worked, UK and G7 excl UK

Actuals and projections



Source: Office for National Statistics

Notes:

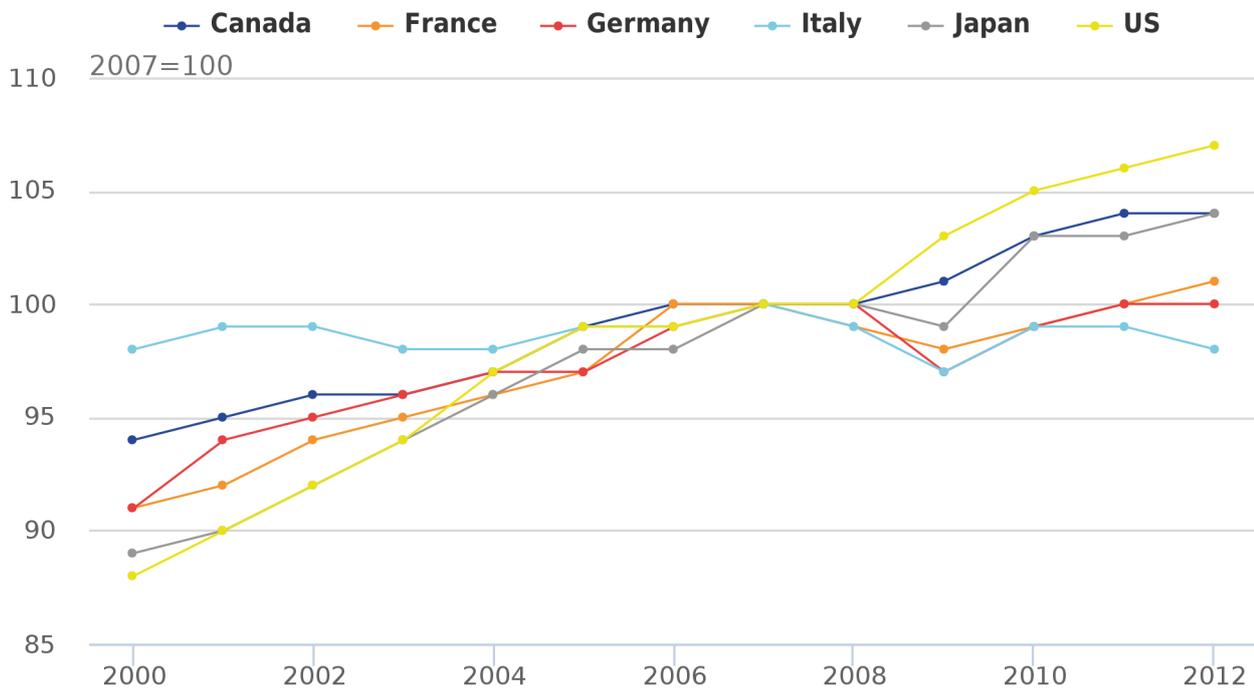
1. Projections based on average growth of GDP per hour worked over 1997-2007 (UK 2.5%, G7 excl UK 1.9%)

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 great recession. On this basis, the combination of strong UK productivity growth up to 2007 and weak productivity performance since 2007 implies a productivity gap of 15 percentage points in 2012 and has been referred to as the 'productivity conundrum'. This is discussed further in articles published by ONS in [August 2012](#) and [October 2012](#).

Average productivity growth between 1997 and 2007 for the rest of the G7 was lower than in the UK (around 1.9%, compared with 2.5% for the UK), and productivity performance since 2007 has on average been somewhat stronger, implying a smaller productivity gap of around 5 percentage points on the same basis.

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 sharply in most countries over the 2008-09 recession, but then rebounded equally sharply in the US, Japan and Canada, whereas the recovery in productivity has been much more muted for the main European economies.

**Figure 5: GDP per hour worked, rest of G7**



Source: Office for National Statistics

Converting the time series in Figure 5 into productivity gaps (calculated as in Figure 4) for 2012 would yield gaps of around 4 percentage points for the US, Japan, Italy and Canada, and 8-9 percentage points for France and Germany, all considerably below the UK productivity gap.

## 6. Revisions

Data used in this publication are subject to revision between publications. Since the Final Estimates for 2011 were published on 13 February 2013, the main sources of revisions are as follows:

- Upward revisions of around 3 percentage points to US GDP data in current and constant prices, reflecting implementation of the 13th comprehensive revision of the national income and product accounts, follow [this link](#) for more information. Revisions to growth rates are much smaller - constant price GDP growth has been revised upwards by 0.1 percentage points over the period since 1990.
- Revisions to levels and growth rates of UK constant price GDP data, see [this article](#) for further information. Average GDP growth has not changed, but the revised series shows a steeper fall in GDP in 2009 (-5.2%) than previously (-4.0%).
- A large (5.2%) upward revision to Japanese employment in 2011. This reflects the reinstatement of survey coverage of areas struck by the Great East Japan Earthquake, where the survey operation was suspended for several months from March 2011.

Tables R1 to R4 in the [reference table \(143 Kb Excel sheet\)](#) component of this release and at the back of the PDF version of this statistical bulletin compare latest estimates with estimates from the previous release on 13 February 2013. Revisions arise from a combination of revisions to the input data cited above. Not surprisingly, the

largest revisions are to Japanese estimates for 2011. Revisions to current price cross-country estimates (Tables R1 and R2) are generally a little larger than revisions to constant price time series (R3 and R4).

## 7. Background notes

### 1. This Statistical Bulletin

ONS publishes 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 input datasets.

### 2. Quality and methodology

A [Quality and Methodology Information paper \(123.8 Kb Pdf\)](#) for this release was published on 20 July 2012. This paper describes 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 2008, 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)). The difference between these measures is that GDP uses market prices and GVA uses basic prices, which exclude taxes and subsidies on production and trade and transport costs. 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.

### 3. Other data on productivity

ONS publishes a quarterly [Labour Productivity statistical release](#), which provides much more detailed information regarding UK labour productivity than this ICP release.

ONS publishes 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'.

ONS also publishes 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 \(2010\) \(252.5 Kb Pdf\)](#).

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

The OECD publishes its own estimates of growth of GDP per hour worked for the G7 and two other aggregates, the EU and OECD. These OECD estimates for the G7 can be compared with the series in [table 3 \(143 Kb Excel sheet\)](#) of this bulletin. The differences between the ONS and OECD productivity series are not large. They can be explained by the different sources used for the component data. In particular, ONS 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 are also slight differences in the GDP data, as the OECD estimates use the Annual National Accounts with results in national currency, whereas ONS uses the Quarterly National Accounts for GDP data.

More international data on productivity are available from [Eurostat](#), and the Conference Board.

### 4. User engagement

ONS is keen to develop a greater understanding of the use made of productivity statistics and will be organising a Productivity Statistics User Group Workshop in early 2014. If you are interested in attending please email [Productivity@ons.gsi.gov.uk](mailto:Productivity@ons.gsi.gov.uk).

If you have something to tell us, please use the [feedback form on ONS productivity statistics](#).

You can follow ONS on [Twitter](#) and [Facebook](#).

5. Details of the policy governing the release of new data are available by visiting [www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html](http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html) or from the Media Relations Office email: [media.relations@ons.gsi.gov.uk](mailto: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.