

Statistical bulletin

Labour Productivity: Q4 2014

Output per hour, output per job and output per worker for the whole economy and a range of industries. Includes estimates of unit labour costs.



Contact:
Stuart Newman
productivity@ons.gsi.gov.uk

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1. Labour productivity, Q4 2014

- UK labour productivity as measured by output per hour fell by 0.2% in the fourth quarter of 2014 compared with the previous quarter. In 2014 as a whole, labour productivity was little changed from 2013, and slightly lower than in 2007, prior to the economic downturn.
- This edition contains revised historical estimates of labour productivity back to 1948, consistent with revisions to National Accounts introduced in Blue Book 2014. These estimates show that the absence of productivity growth in the seven years since 2007 is unprecedented in the post-war period.
- Despite weak productivity growth, unit labour costs have increased only modestly, by less than 1% per year on average over the last five years. This reflects low growth in labour costs per hour worked.
- Notwithstanding a fall in manufacturing output per hour in the final quarter of 2014, there was a broad-based and robust recovery in productivity across manufacturing in 2014 as a whole. Productivity also grew in 2014 across the construction industry.
- Productivity across all service industries grew a little in the final quarter of 2014 and in 2014 as a whole. But productivity performance was more varied between different service industries: output per hour fell in six service industries and rose in five.

2. About this release

This release reports labour productivity estimates for the fourth quarter of 2014 for the whole economy and a range of sub-industries, together with selected estimates of unit labour costs. Labour productivity measures the amount of real (inflation-adjusted) economic output that is produced by a unit of labour input (measured in this release in terms of workers, jobs and hours worked) and is an important indicator of economic performance.

Labour costs make up around two-thirds of the overall cost of production of UK economic output. Unit labour costs are therefore a closely watched indicator of inflationary pressures in the economy.

Output statistics in this release are consistent with the latest [Quarterly National Accounts](#) published on 31 March 2015. Labour input measures are consistent with the latest [Labour Market Statistics](#) as described further in the 'General commentary' and 'Notes on sources' sections below.

3. Interpreting these statistics

Whole economy output (gross value added - GVA) increased by 0.6% in the fourth quarter of 2014, while the Labour Force Survey (LFS) shows that the number of workers, jobs and hours increased by 0.3%, 0.3% and 0.8% respectively over this period¹. Since growth of labour productivity can be decomposed as growth of GVA minus growth of labour input, this combination of movements in outputs and labour inputs implies that labour productivity across the whole economy increased a little in terms of output per worker and output per job but decreased a little in terms of output per hour.

Differences between growth of output per worker and output per job reflect changes in the ratio of jobs to workers. This ratio fell slightly in Q4, reflecting a small decrease in the estimated number of workers with second jobs. Differences between these measures and output per hour reflect movements in average hours which, though typically not large from quarter to quarter, can be material over a period of time. For example, a shift towards part-time employment will tend to reduce average hours. For this reason, output per hour is a more comprehensive indicator of labour productivity and is the main focus of the commentary in this release.

Unit labour costs (ULCs) reflect the full labour costs, including social security and employers' pension contributions, incurred in the production of a unit of economic output, while unit wage costs (UWCs) are a

narrower measure, excluding non-wage labour costs. Growth rates of these series can be decomposed as growth of labour costs per unit of labour input minus growth of labour productivity. For example, the increase in whole economy ULCs of 0.5% in Q4 can be decomposed into a fall of 0.2% in output per hour and an implied increase of 0.3% in labour costs per hour. In the manufacturing sector, the combination of an increase in UWCs of 0.9% and a fall in output per hour of 1.3% implies that wage costs per hour in manufacturing fell by 0.4% in Q4 ².

Most of the series in this release are designated as National Statistics, meaning their production has been subject to rigorous quality assurance and methodological scrutiny. However, some service industry estimates use component series from the Index of Services (IOS) which are designated as experimental statistics (that is, not yet accredited as National Statistics, for example because the methodology is under development or reflecting concerns over data sources). Labour productivity estimates that use these series as their numerators are also labelled as experimental statistics. Market sector productivity estimates are also experimental series. More information on the experimental IOS series is available on the [Guidance and methodology](#) section of the ONS website.

Notes for interpreting these statistics

1. Growth rates for whole economy workers, jobs and hours shown in Table 10 of this release may differ slightly from growth rates based on LFS aggregate estimates due to different methods of seasonal adjustment.
2. ONS also publishes estimates of Indices of Labour Costs per Hour (ILCH). ILCH uses different sources to those used in this release, and estimates may differ at the whole economy and component level.

4. General commentary

Productivity estimates for Q4 2014 provide an opportunity to consider trends in productivity over a number of calendar years. At the whole economy level, output per hour was virtually unchanged between 2013 and 2014, and the level in 2014 was close to that in 2007, prior to the economic downturn. As shown in Figure 1, taken from the [historical estimates \(115.5 Kb Excel sheet\)](#) component of this release, such a prolonged period of essentially flat productivity is unprecedented in the post-war era.

Figure 1 also shows that, up to 2007, output per hour grew a little faster than output per job and output per worker (which are indistinguishable from one another). This reflects a trend decline in average hours worked, perhaps reflecting workers' preference for increased leisure time as their standards of living increased. This pattern, too, has not been maintained in recent years, as average hours worked have nudged upwards.

Figure 2, also taken from the [historical estimates \(115.5 Kb Excel sheet\)](#) component, shows that growth of unit wage costs over the period 2007-14 is not so dissimilar to the post-war period as a whole, with the period of high inflation in the 1970s standing out. Taking figures 1 and 2 together provides some support for the existence of a relationship between productivity and earnings growth, as the plateauing of productivity since 2007 has been reflected in a reduction in the rate of earnings growth across the economy as a whole.

Figure 3 presents a breakdown of annual movements in whole economy output per hour in terms of the main industry components. Unsurprisingly given the weight of services in overall economic activity, the services components are prominent in most years, albeit less so in recent years. The financial services industry was an important contributor to productivity growth (especially relative to its weight) in the period prior to the economic downturn, but is yet to make a material positive contribution since the downturn. By contrast, manufacturing and construction productivity contributions turned positive in 2014 and there are some signs that the structural issues affecting productivity in the extractive industries (an important element of ABDE) may be coming to an end.

5. Whole economy labour productivity

Figure 4 shows whole economy output per hour in terms of index levels and percentage changes, and Figure 5 provides a breakdown of the components of labour productivity since 2008. It is clear from Figure 5 that hours worked have increased faster than jobs since 2011, implying that average hours per job have also increased. This is consistent with the weaker path of output per hour compared with output per job.

More information is available in Reference Table [LPROD01 \(357 Kb Excel sheet\)](#) and in the tables at the end of the PDF version of this statistical bulletin.

6. Unit labour costs

Figure 6 shows whole economy ULCs in terms of index levels and percentage changes. A set of industry-level ULCs based on a consistent methodology ('[Sectional unit labour costs](#)') is published as a [component \(239.5 Kb Excel sheet\)](#) of this release. At the whole economy level the two sets of estimates are identical apart from the method of seasonal adjustment.

Manufacturing unit wages costs (Figure 7) increased by 0.9% in the fourth quarter and were 0.8% lower than a year earlier. As well as being a narrower measure than unit labour costs, the manufacturing unit wage cost series currently uses average weekly earnings in manufacturing (an estimate of employee earnings) to proxy the earnings of self-employed workers in manufacturing.

This approach is inconsistent with other ONS data on incomes from self-employment, such as those embodied in the income presentation of GDP. As noted above, a set of industry-level ULCs based on a consistent methodology ('[Sectional unit labour costs](#)') is published as a [component \(239.5 Kb Excel sheet\)](#) of this release. Estimates of manufacturing ULCs display broadly similar time series properties to those of the published UWC series (identifier DIX4).

More information on unit labour costs and unit wage costs is available in Table 2 in Reference Table [LPROD01 \(357 Kb Excel sheet\)](#).

7. Manufacturing labour productivity

Productivity jobs estimates in manufacturing increased by 0.5% for Q4 2014, while GVA increased by 0.2%. These data led to a fall in manufacturing output per job of 0.3% for the quarter, as shown in Reference Table [LPROD01 \(357 Kb Excel sheet\)](#) (Table 1).

Manufacturing output per hour fell by a much larger 1.3% on the quarter, reversing four quarters of positive changes. Output per hour remains 1.8% higher than in Q4 2013 and it is close to its 2011 level. The larger fall in output per hour reflects hours growing at a faster rate than jobs in manufacturing, as shown in Figure 8.

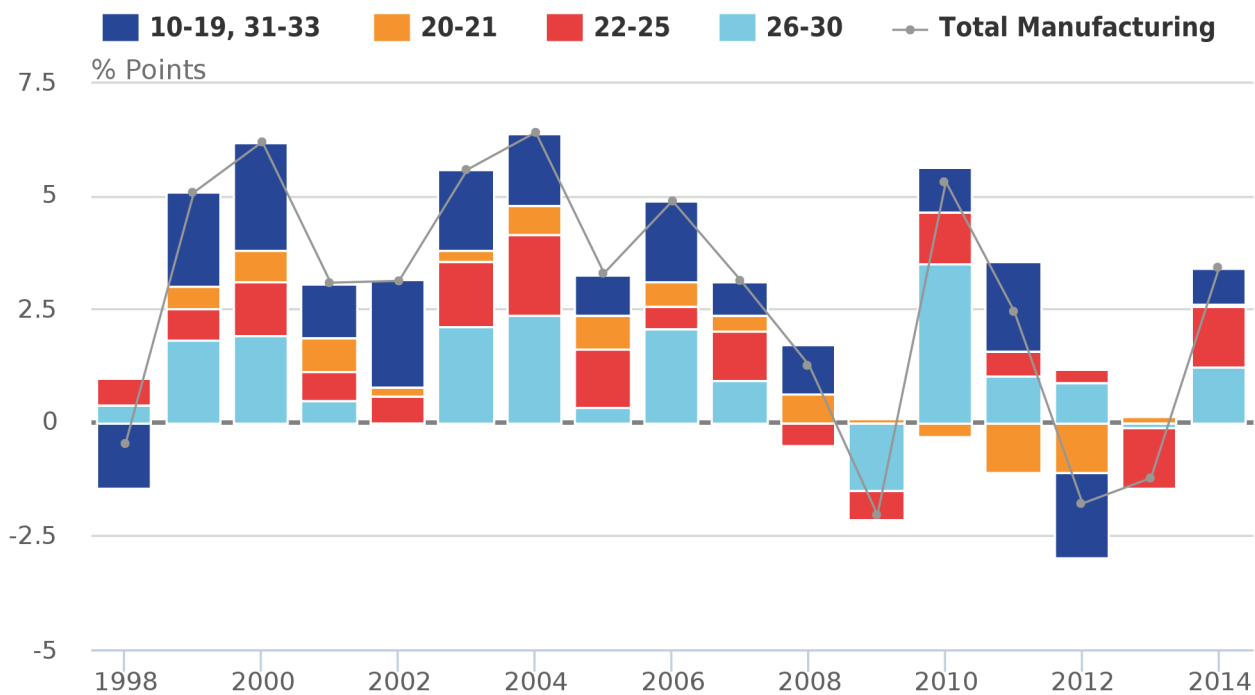
Despite recent falls in output per job and output per hour, manufacturing is more productive in Q4 2014 than it was a year ago. Output per job is 2.4% higher than in Q4 2013 and output per hour is 1.8% higher.

Figure 9 shows the contribution of different industry groups to changes in output per hour for manufacturing from 1998 to 2014. For much of the period, every manufacturing industry had positive contributions to overall manufacturing output per hour. From 2008, those contributions have been less uniform, though every industry contributed negative growth to output per hour for at least one year.

In particular, output per hour in the pharmaceutical industry (20-21) has been weak for several years, though its contribution to total manufacturing output per hour did turn positive in 2014.

Another striking feature of Figure 9 is the sharp recovery in manufacturing output per hour in 2010, before a further downturn in 2012. The increase in manufacturing productivity in 2014 is not as large as that of 2010, but it is notable that 2014 is the first year since 2007 where the contribution of each of these industry groups to total manufacturing output per hour is positive.

Figure 9: Contributions to growth of manufacturing output per hour



Source: Office for National Statistics

Notes:

1. 10-19 refers to Food products, beverages and tobacco (10-12), Textiles, wearing apparel & leather (13-15), Wood & paper products & printing (16-18) and Coke & refined petroleum products (19). 31-33 refers to Other Manufacturing.
2. 20-21 refers to Chemical and Pharmaceutical products.
3. 22-25 refers to Rubber, plastics & other non-metallic minerals (22-23), Basic metals and metal products (24-25).
4. 26-30 refers to Computer products, Electrical equipment (26-27), Machinery & equipment (28) and Transport equipment (29-30).

More information on the labour productivity of sub-divisions of manufacturing is available in Reference Table [LPROD01 \(357 Kb Excel sheet\)](#) (Tables 3 and 4), and in the tables at the end of the PDF version of this statistical bulletin. Care should be taken in interpreting quarter on quarter movements in productivity estimates for individual sub-divisions, as small sample sizes of the source data can cause volatility.

Tables 3 and 4 include annual estimates for the level of productivity in £ terms for the National Accounts base year of 2011. These are estimates of GVA per unit of labour input and are not necessarily related to pay rates. Output per job (Table 3) varied from £39.3k in Wood and paper products (divisions 16-18) to £134.4k in Chemicals & Pharmaceuticals (divisions 20-21). The average for the whole of manufacturing was £57.5k and the average for the whole economy was £47.2k in 2011.

Chemicals & Pharmaceuticals was also top of the distribution for output per hour in 2011 (£75.2), with Wood, paper products, & printing (divisions 16-18) and Basic metals & metal products (divisions 24-25) at the bottom of the distribution. On this basis the average for manufacturing as a whole was £31.1 and the average for the whole economy was £30.0 per hour.

8. Services labour productivity

Output per job estimates for services continued to grow in Q4 2014, climbing 0.7% on the quarter and 1.3% on the year, as shown in Reference Table [LPROD01 \(357 Kb Excel sheet\)](#) (Table 1). The growth in output per hour for services was more subdued, returning a 0.2% increase on the quarter and a 0.7% increase on the year.

The difference in growth rates for the two measures reflects hours worked growing faster in service-based companies than the number of jobs. Output per hour for services was 0.3% higher in Q4 2014 than the average level for 2011, compared to 2.5% higher for output per job.

Figure 10 illustrates these trends with hours growing at a similar rate to output since mid-2011, while services jobs have grown at a slightly lower rate. Both measures seem to be following a steady trend after some fluctuations following the financial crisis.

Figure 11 shows each services industry's contribution to total services output per hour since 1998.

As with manufacturing, services industry contributions to output per hour growth were broadly positive for much of the period. There was a sharp downturn in these contributions in 2008 and 2009 and the performance of many industries since then has been mixed.

It is notable that the contribution from the Finance and Insurance industry to total services output per hour has been negative since 2010. This contrasts with the positive contributions from this industry for most years prior to 2010.

The Real Estate industry also stands out because its contributions to total services output per hour have been positive every year since 1998. However, Real Estate productivity is affected by the National Accounts concept of output from owner-occupied housing, which adds to the numerator but without a corresponding component in the denominator. As such, users should approach productivity estimates for the real estate industry with some caution.

More information on labour productivity of services industries is available in Tables 5 and 6 of Reference Table [LPROD01 \(357 Kb Excel sheet\)](#) and in the tables at the end of the PDF version of this statistical bulletin.

In general, the dispersion of labour productivity growth rates across service industries is less pronounced than within manufacturing. But the dispersion of productivity levels is more pronounced. Excluding the Real Estate industry (for reasons noted above), output per job in 2011 varied from £21.6k in Accommodation & food services (section I) to £106.2k in Finance & insurance (section K). These industries were also at the bottom and top of the productivity distribution in terms of output per hour (Table 6).

9. Market sector labour productivity (NOT NATIONAL STATISTICS)

Market sector output per hour fell slightly faster than that of the whole economy in Q4 over Q3 2014. Since 2010 output growth has been a little faster on average in the market sector than in the economy as a whole, but hours worked have grown to a faster degree, such that growth of market sector output per hour has lagged a little behind the whole economy trend.

In this release the time series for market sector output per hour has been extended back to Q2 1992. This longer time series is available in Table 7 in Reference Table [LPROD01 \(357 Kb Excel sheet\)](#).

10. Revisions

The Revisions table in Reference Table [LPROD01 \(357 Kb Excel sheet\)](#) shows revisions to growth rates of the main productivity estimates for the whole economy and selected sub-industries between the previous release on 24 December 2014 and this release.

On the output side, GVA estimates have been revised back to Q1 2014. The revisions show a slightly higher level of GVA for the period, mainly reflecting upward revisions in manufacturing and construction activity. Output levels for services were barely affected.

On the input side, jobs estimates have been revised at the industry level due to short-term business survey results being re-benched. These changes are not apparent at the whole economy level, because labour productivity benchmarks to Labour Force Survey measures of total employment, which have not been revised.

The impact of the re-benching is reflected in revisions to manufacturing productivity estimates, though services estimates have not changed as much. This is because there are significantly fewer jobs in manufacturing, so it is more sensitive to changes at the margin.

A [research note on sources of revisions \(145.4 Kb Pdf\)](#) to labour productivity estimates is available on the ONS website.

Table A below summarises differences between first published estimates for each of the statistics in the first column with the estimates for the same statistics published three years later. This summary is based on five years of data, that is, for first estimates of quarters between Q1 2007 and Q4 2011, which is the last quarter for which a three-year revision history is available. The averages of these differences with and without regard to sign are shown in the right hand columns of the table, and these can be compared with the value of the estimates in the latest quarter, shown in the second column. Additional information on revisions to these and other statistics published in this release is available in the [Revisions Triangles \(1.19 Mb Excel sheet\)](#) component of this release.

This revisions analysis shows that whole economy labour productivity growth estimates have tended to be revised down over time, by 0.1-0.2 percentage points (on a year-on-year basis), while unit labour costs growth estimates have tended to be revised up by up to 0.2 percentage points. Were the average revisions to apply to the current release, growth of output per hour in the year to the fourth quarter of 2014 would be revised down from 0.3% to 0.1% over the next three years, and growth of unit labour costs would be revised up from 1.2% to 1.4% over the same period.

11. Notes on sources

The measure of output used in these statistics is the chain volume (real) measure of Gross Value Added (GVA) at basic prices, with the exception of the regional analysis in Table 9, where the output measure is nominal GVA (NGVA). These measures differ because NGVA is not adjusted to account for price changes; this means that if prices were to rise more quickly in one region than the others, then this would be reflected in apparent improved measured productivity performance in that region relative to the others. At the whole economy level, real GVA is balanced to other estimates of economic activity, primarily from the expenditure approach. Below the whole

economy level, real GVA is generally estimated by deflating measures of turnover; these estimates are not balanced through the supply-use framework and the deflation method is likely to produce biased estimates. This should be borne in mind in interpreting labour productivity estimates below the whole economy level.

Labour input measures used in this bulletin are known as 'productivity jobs' and 'productivity hours'. Productivity jobs differ from the workforce jobs (WFJ) estimates published in Table 6 of the ONS [Labour Market Statistics](#) Bulletin, in three ways:

- To achieve consistency with the measurement of GVA, the employee component of productivity jobs is derived on a reporting unit (RU) basis, whereas the employee component of the WFJ estimates is on a local unit (LU) basis. This is explained further below.
- Productivity jobs are scaled so industries sum to total LFS jobs. Note that this constraint is applied in non-seasonally adjusted terms. The nature of the seasonal adjustment process means that the sum of seasonally adjusted productivity jobs and hours by industry can differ slightly from the seasonally adjusted LFS totals.
- Productivity jobs are calendar quarter average estimates whereas WFJ estimates are provided for the last month of each quarter.

Productivity hours are derived by multiplying employee and self-employed jobs at an industry level (before seasonal adjustment) by average actual hours worked from the LFS at an industry level. Results are scaled so industries sum to total unadjusted LFS hours, and then seasonally adjusted.

Industry estimates of average hours derived in this process differ from published estimates (found in Table HOUR03 in the [Labour Market Statistics](#) release) as the HOUR03 estimates are calculated by allocating all hours worked to the industry of main employment, whereas the productivity hours system takes account of hours worked in first and second jobs by industry.

Whole economy unit labour costs are calculated as the ratio of total labour costs (that is, the product of labour input and costs per unit of labour) to GVA. Further detail on the methodology can be found in [Revised methodology for unit wage costs and unit labour costs: explanation and impact](#).

Manufacturing unit wage costs are calculated as the ratio of manufacturing average weekly earnings (AWE) to manufacturing output per filled job. On 28 November 2012 ONS published [Productivity Measures: Sectional Unit Labour Costs](#) describing new measures of unit labour costs below the whole economy level, and proposing to replace the currently published series for manufacturing unit wage costs with a broader and more consistent measure of unit labour costs.

What is a reporting unit?

The term 'enterprise' is used by ONS to describe the structure of a company. Individual workplaces are known as 'local units' and a group of local units under common ownership is called the 'enterprise'. In ONS business surveys, reporting units are the parts of enterprises that return data to ONS. While the majority of reporting units and enterprises are the same, larger enterprises have been split into reporting units to make the reporting easier.

For most business surveys run by ONS, forms are sent to the reporting unit rather than local units, in other words, to the head office rather than individual workplaces. This enables ONS to gather information on a greater proportion of total business activity than would be possible by sending forms to a selection of local units. But it has the disadvantage that it is difficult to make regional estimates – for instance all the employment of, say, a chain of shops would be reported as being concentrated at the site of the head office.

Further differences between reporting unit and local unit data can be seen in the industry coding. Take, for example, a reporting unit with three cake shops and one bakery, each employing five people. The local unit analysis would put 15 employees in the retail industry and five employees in the manufacturing industry. But the reporting unit series puts all 20 people into the industry with the majority activity, in this case, retailing. Detailed industry figures compiled using the local unit approach will therefore be different from industry figures using the reporting unit approach, although the totals will be the same at the whole economy level.

12. Background notes

1. This statistical bulletin

This statistical bulletin presents Labour Productivity estimates for the UK. More detail can be found on the [Productivity Measures Topic page](#) on the ONS website.

Index numbers are referenced to 2011=100, are classified to the 2007 revision to the Standard Industrial Classification (SIC) and are seasonally adjusted.

Quarter on previous quarter changes in output per job and output per hour worked for some of the manufacturing sub-divisions and services sections should be interpreted with caution as the small sample sizes used can cause volatility.

2. Quality and methodology

A revised and updated [Quality and Methodology Information paper](#) (Labour Productivity link) for Labour Productivity was published in March 2012. This paper describes the intended uses of the statistics presented in this publication, their quality and methods used to produce them. It also includes more information on the uses and limitations of labour productivity estimates.

3. Future developments

ONS published ' [Productivity measures and analysis: ONS work plan \(241 Kb Word document\)](#) ' in February 2015, reviewing developments since the last productivity workplan was published in 2006 and setting out priorities for future work. Although this was not a formal consultation document, ONS welcomes feedback from users, which can be sent to productivity@ons.gsi.gov.uk.

In 2012 ONS developed new and improved measures of labour input as part of ongoing work to comply with EU regulations. Specifically, these new measures provide an industry breakdown of employment (i.e. on a headcount basis rather than a job basis), and provide a split between employees and the self-employed. For methodological consistency, this work has also made some changes to the computation of corresponding hours series. These series are currently available on the [Eurostat](#) website and ONS has published an article entitled [Introducing New Labour Productivity Statistics](#) which describes these new series.

In response to user requests, ONS has now published selected estimates of labour productivity using the new and improved estimates of labour inputs, together with comparisons against the corresponding estimates from the existing productivity system. These are available as an additional reference table component (table NEWLPROD01) of the aforementioned article.

4. Other data on productivity

ONS has published [Labour Productivity Measures from the ABS, 2008-2012](#). This article uses published estimates from the Annual Business Survey (ABS) to provide more detailed information on recent trends in labour productivity by industry than those available from other sources.

ONS publishes [International comparisons of labour productivity](#) in levels and growth rates for the G7 countries.

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

ONS publishes experimental estimates of [Multi-factor productivity](#) (MFP), which decompose output growth into the contributions that can be accounted for by labour and capital inputs. In these estimates, the contribution of labour is further decomposed into quantity (hours worked) and quality dimensions.

ONS also publishes [experimental indices of labour costs per hour](#). These differ from the concept of labour costs used in the unit labour cost estimates in this release. The main difference is that experimental indices of labour costs per hour relate to employees only, whereas unit labour costs also include the labour remuneration of the self-employed.

Lastly, ONS publishes a range of [Public sector productivity](#) measures and related articles. These measures define productivity differently from that used 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](#).

5. User engagement

ONS hosted a half-day workshop for users of productivity statistics in London on 4 February 2015. Presentation slides and a note of the workshop are available [here](#). If you are interested in attending future workshops or if you have any comments on this release please email Productivity@ons.gsi.gov.uk.

You can follow ONS on Twitter: www.twitter.com/ons and Facebook: www.facebook.com/statisticsons.

6. Publication policy

Details of the policy governing the release of new data are available from the [UK Statistics Authority](#) or from the Media Relations Office email: media.relations@ons.gsi.gov.uk. [A list of the names](#) of those given pre-publication access to the contents of this bulletin is also available.

7. 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.