

Article

Quarterly public service productivity (Experimental Statistics): Jan to Mar 2017

Experimental estimates for quarterly UK total public service productivity, inputs and output to provide short-term indicator of annual productivity estimates.

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Table of contents

1. [Main points](#)
2. [Things you need to know about this release](#)
3. [Quarterly public service productivity rises as growth in output outstrips growth in inputs](#)
4. [What's changed in this release?](#)
5. [Future developments](#)
6. [Authors](#)
7. [Quality and methodology](#)
8. [Links to related statistics](#)

1 . Main points

- These estimates are [experimental](#), using a degree of estimation to deliver timelier estimates compared with our [annual public service productivity](#) figures; these are published with a 2-year lag, the methodology used in these estimates is explained in [New nowcasting methods for more timely quarterly estimates of UK total public service productivity](#).
- In Quarter 1 (Jan to Mar) 2017, productivity for total public services increased by 0.3% relative to the previous quarter; this followed on from a 0.1% decrease in Quarter 4 (Oct to Dec) 2016.
- Comparing with the same quarter in the previous year, Quarter 1 2017 saw an increase in productivity of 0.7%.
- In 2016, year-on-year productivity for total public services has increased by 0.4%, as year-on-year output growth of 0.8% exceeded input growth of 0.4%, leading to an increase in the ratio of output to inputs.

2 . Things you need to know about this release

Productivity of public services is estimated by comparing growth in total output with growth in total inputs used. Productivity will increase when more output is being produced for each unit of input. Estimates of output, inputs and productivity are given both as growth rates between consecutive periods and as indices that show the cumulative trend over time.

Estimated growth rates of output and inputs for individual public services are aggregated by their relative share of total expenditure on public services (expenditure weight) to produce estimates of total public service output, inputs and productivity.

Inputs are composed of expenditure on labour, goods and services, and of consumption of fixed capital. They are adjusted for inflation using a suitable price index (deflator). Expenditure data used to estimate inputs growth are taken from the Quarterly National Accounts (QNA). Alternatively, volume measures are used where available, such as full-time equivalent for labour input.

The QNA also provides estimates of government output based on direct measures where they are available and indirect measures where they are not. Direct measures of output use the number of activities performed and services delivered, which are weighted together using the relative cost of delivery. Indirect measures of service output assume that the volume of output is equal to the volume of inputs used to create them. This is referred to as the “Output=Inputs” convention and means productivity growth will always be zero where indirect measures are used.

This release presents experimental estimates for quarterly total public service productivity, inputs and output, providing a short-term timely indicator of the future path for the [annual estimates of total public service productivity](#), which are produced with a 2-year lag.

Trends in quarterly total public service output, inputs and productivity estimates are mostly determined by those service areas where quarterly data are readily available, for example, healthcare. A large proportion of activity data used to estimate the volume of output are annual data. This has subsequently been converted to a quarterly series – split among the 4 quarters – reducing the impact these components have on volatility.

Annual estimates for 2015 and 2016 are taken from annualised quarterly data and are comparable to the [existing annual series](#) over the period 1997 to 2014. Differences between the annual and quarterly experimental public service productivity estimates are a result of differences in the estimates of output and inputs. Further information on these differences can be found in [New nowcasting methods for more timely quarterly estimates of UK total public service productivity](#).

3 . Quarterly public service productivity rises as growth in output outstrips growth in inputs

In Quarter 1 (Jan to Mar) 2017, total public service productivity increased by 0.3% relative to the previous quarter. This was a return to quarterly growth, following a slight contraction of 0.1% in the final quarter of 2016, and continued a general upwards trend seen in recent years. As a result of this, productivity was 0.7% higher than in Quarter 1 2015.

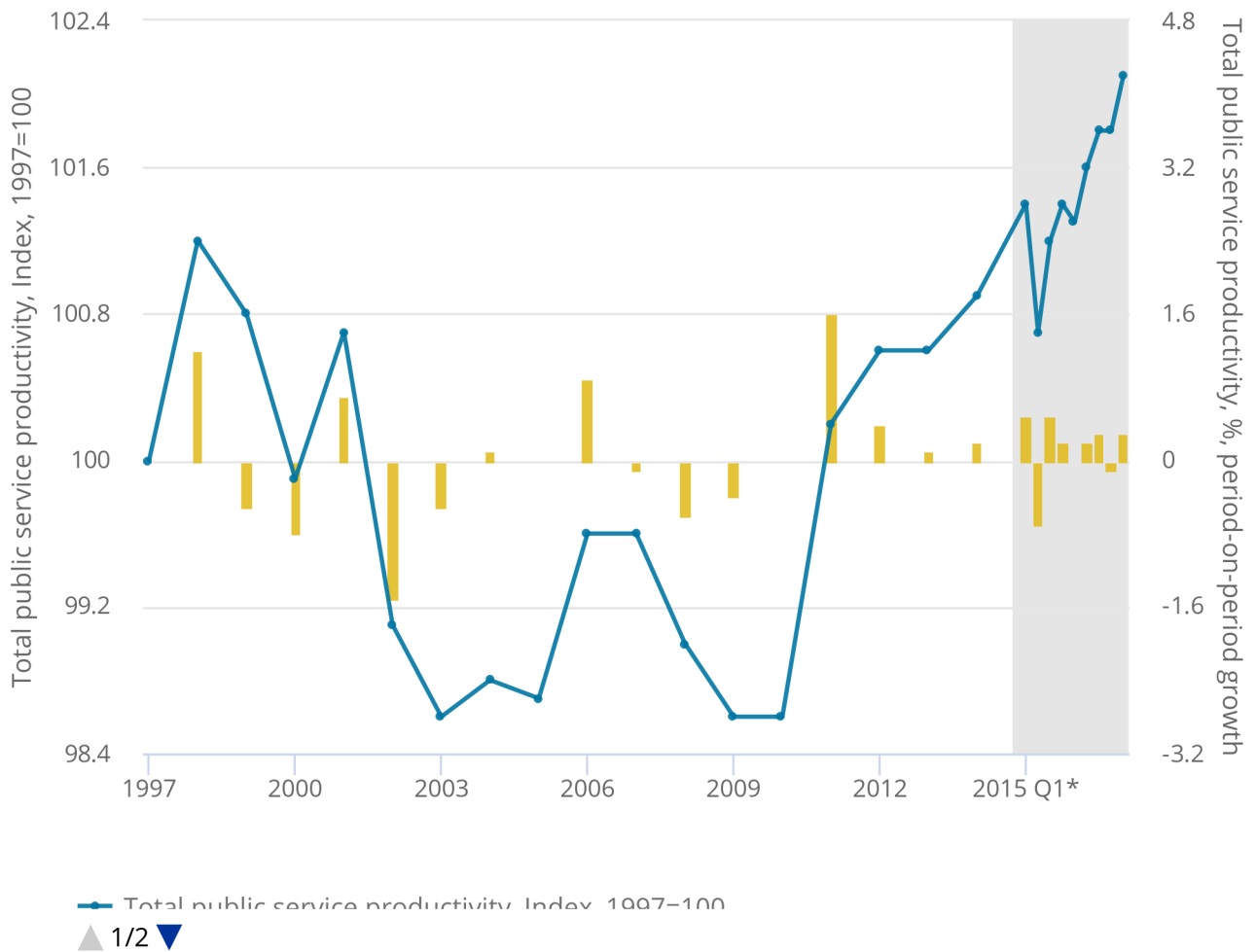
Placing this in the context of a longer time series, Figure 1 combines the latest experimental quarterly estimates – covering Quarter 1 2015 to Quarter 1 2017 – with annual estimates for between 1997 and 2014, taken from our [Public service productivity estimates: total public service, UK: 2014](#) release. It suggests that, despite volatility in the quarterly path, the productivity of UK public services has been on an upwards trend for much of the last 6 years. Between 2010 and 2016, total public service productivity is estimated to have increased by 3.0% – around 0.5% growth per year. This represents the longest sustained period of growth in public service productivity since the start of the series in 1997.

Figure 1: Total UK public service productivity

1997 to Quarter 1 (Jan to Mar) 2017

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1997 to Quarter 1 (Jan to Mar) 2017



Source: Office for National Statistics

Source: Office for National Statistics

Notes:

1. Estimates from 1997 to 2014 are based on the existing annual series.
2. Estimates from 2015 Q1 to 2017 Q1 are based on the experimental quarterly total public service productivity series.
3. Estimates for 2015 Q1 reflect the growth rate between annualised quarterly productivity for 2014 and 2015 Q1.
4. Estimates of productivity for the experimental period are indirectly seasonally adjusted, calculated using seasonally adjusted inputs and seasonally adjusted output.
5. Asterisks (*) and greyed out area reference periods were estimates are based on experimental methodology.

Figure 2 breaks down the productivity estimate into the underlying changes in inputs and output of total public services.

It shows that both total public service inputs and output increased in Quarter 1 (Jan to Mar) 2017, with the latest rise in quarterly productivity driven by growth in output of 0.7%, exceeding growth in inputs of 0.4%. This meant that there was an increase in the ratio of output to inputs, leading to an increase in productivity.

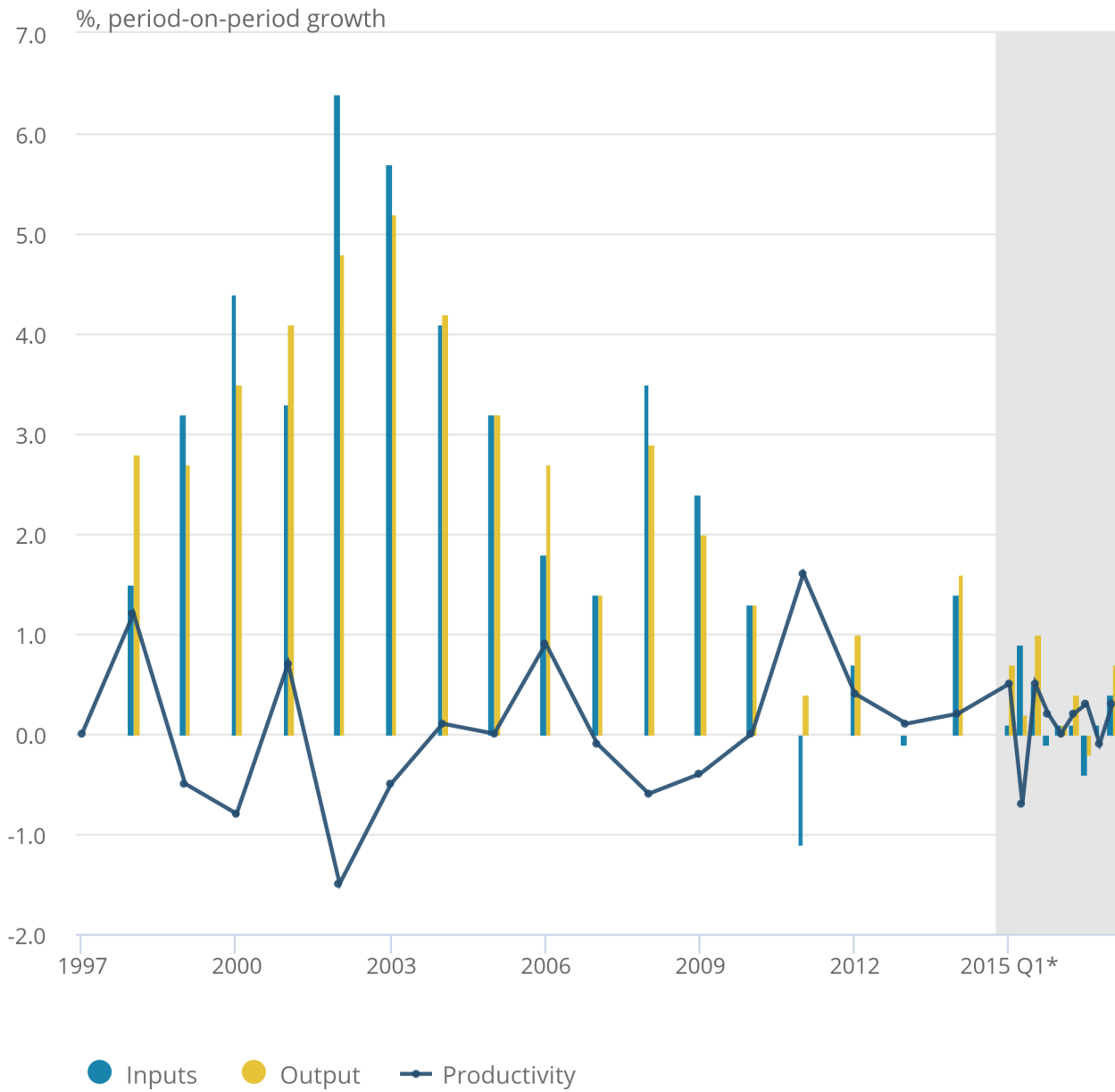
Figure 2 also illustrates the longer-term trend, showing the change in both components since 1997, with growth up to 2014 taken from the [existing annual series](#) and growth rates after this taken from the quarterly experimental series. While inputs have continued to increase for much of the last 6 years, growth in output has been larger and therefore driven a rise in productivity. Taking each series from 2010 to 2016, inputs have grown by 2.3% (0.4% per annum) while output has risen by 5.4% – equivalent to 0.9% per annum.

Figure 2: Growth in total UK public service inputs, output and productivity

1997 to Quarter 1 (Jan to Mar) 2017

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Notes:

1. Estimates from 1997 to 2014 are based on the existing annual series.
2. Estimates from 2015 Q1 to 2017 Q1 are based on the experimental quarterly total public service series.
3. Estimates for 2015 Q1 reflect the growth rate for inputs and outputs between annualised quarterly estimates for 2014 and 2015 Q1.
4. Estimates of inputs and output for the experimental period are directly seasonally adjusted.
5. Asterisks (*) and greyed out area reference periods were estimates are based on experimental methodology.

Further information on data sources for quarterly total public service productivity can be found in the [Quality and Methodology Information report](#) and in [New nowcasting methods for more timely quarterly estimates of UK total public service productivity](#). These articles highlight methods and caveats for producing the quarterly growth estimates and they should be referenced when reporting on specific quarterly movements. This is especially the case for the latest quarters, which are more liable to be subject to revisions.

4 . What's changed in this release?

All estimates, by definition, are subject to statistical “error”, but in this context the word refers to the uncertainty inherent in any process or calculation that uses sampling, estimation or modelling. Most revisions reflect either the adoption of new statistical techniques, or the incorporation of new information, which allows the statistical error of previous estimates to be reduced. Public service productivity estimates operate an open revisions policy. This means that new data or methods can be incorporated at any time and will be implemented for the entire time series.

Compared with the [latest release, published on 5 April 2017](#), a number of minor revisions have been incorporated to the quarterly experimental series, including:

- further improvement made to the price indices used to deflate intermediate consumption
- minor revisions to some price deflators
- minor revisions to the direct measures of labour input

These changes mean that productivity and its subsequent components – inputs and output – have experienced either minor or no revisions from previous estimates.

5 . Future developments

This article presents updated experimental quarterly total public service productivity, inputs and output series, aiming to provide a timelier indicator of the likely trend in the existing annual series. These estimates are based on different sources from those used to estimate annual total public service productivity. The sources used here contain less detail and necessarily involve a greater degree of estimation than annual estimates produced later. As a result, they are not replacements for the annual estimates, and are merely intended to provide a timelier estimate for the more recent period. We aim to assess the impact of these differences and to address issues such as quality adjustment, direct measures, the treatment of annual data and service level breakdown in future work.

Feedback on the use of these estimates and suggestions for improvements will be essential for the future development of timely estimates for public service productivity. All feedback is welcome and can be sent to fred.foxton@ons.gsi.gov.uk.

6 . Authors

Piotr Pawelek, Fred Foxton and Sam Turnock.

7 . Quality and methodology

The [Quarterly public service productivity estimates: Total public services Quality and Methodology Information](#) document contains important information on:

- the strengths and limitations of the data and how it compares with related data
- users and uses of the data
- how the output was created
- the quality of the output including the accuracy of the data

8 . Links to related statistics

5 July 2017: [UK productivity introduction: Jan to Mar 2017](#) draws together the headlines of the productivity releases into a single release, providing additional analysis of our productivity statistics.

5 July 2017: [Labour productivity: Jan to Mar 2017](#) contains the latest estimates of labour productivity for the whole economy and a range of industries, together with estimates of unit labour costs.

5 July 2017: [Introducing industry-by-region labour metrics and productivity](#) presents new, experimental industry-by-region productivity metrics. This includes measures of hours worked, jobs, and accompanying productivity measures for the SIC letter industries in the NUTS1 regions.

5 July 2017: [Who are the “laggards”? Understanding firms in the bottom 10% of the labour productivity distribution in Great Britain](#) examines the characteristics of businesses in the bottom 10% of the labour productivity distribution in terms of their size, age, industry and location, between 2003 and 2015.

5 July 2017: [Developing improved estimates of Quality Adjusted Labour Inputs using the Annual Survey of Hours and Earnings: A progress report](#) describes work to improve the precision of income weights used in quality adjustment and to develop finer industry granularity of quality adjusted labour input for multi-factor productivity.

5 July 2017: [Developing new measures of infrastructure investment: July 2017](#) is the first in a series of papers on infrastructure statistics, focusing on definitional and data challenges in measuring infrastructure investment.

5 July 2017: [Quarterly public service productivity \(experimental statistics\): Jan to Mar 2017](#) presents experimental estimates for quarterly UK total public service productivity, inputs and output to provide a short-term, timely indicator of the future path of annual public service productivity estimates.

5 April 2017: [International comparisons of UK productivity \(ICP\), final estimates: 2015](#) presents an international comparison of labour productivity across the G7 nations, in terms of growth in GDP per hour and GDP per worker.

5 April 2017: [Multi-factor productivity estimates: Experimental estimates to 2015](#) decomposes output growth into the contributions that can be accounted for by labour and capital inputs. The contribution of labour is further decomposed into quantity (hours worked) and quality dimensions.

5 April 2017: [Labour productivity measures from the Annual Business Survey, 2006 to 2015](#) presents an analysis of detailed productivity trends and distributions among businesses in the UK from 2006 to 2015, using firm-level data from the Annual Business Survey (ABS).

5 April 2017: [Introducing quarterly regional labour input metrics](#) provides a first look at the new experimental quarterly regional labour input metrics. Hours and jobs for the NUTS1 regions.

5 April 2017: [Exploring labour productivity in rural and urban areas in Great Britain](#) investigates differences in rural and urban labour productivity in Great Britain using firm-level microdata analysis of the business economy.

6 January 2017: [Regional and sub-regional productivity in the UK: Jan 2017](#) provides statistics for several measures of labour productivity. Statistics are provided for the NUTS1, NUTS2 and NUTS3 subregions of the UK, and for selected UK city regions.

6 January 2017: [Regional firm-level productivity analysis for the non-financial business economy: Jan 2017](#) provides experimental analysis on the sources of regional differences in labour productivity in the non-financial business economy in Great Britain.

6 January 2017: [Volume index of UK capital services \(experimental\): estimates to 2015](#) provide estimates of the contribution of the capital stock to production in the economy, split by asset and industry.

6 January 2017: [Public service productivity estimates: total public service, UK: 2014](#) presents updated measures of output, inputs and productivity for public services in the UK between 1997 and 2013, in addition to new estimates for 2014. Includes service area breakdown, as well as impact of quality adjustment and latest revisions.

6 January 2017: [Public service productivity estimates: healthcare, 2014](#) presents updated estimates of output, inputs and productivity for public service healthcare in the UK between 1995 and 2013, and new estimates for 2014.

6 October 2016: [Quality adjusted labour input: UK estimates to 2015](#) includes estimates of changes in the number of hours supplied in the UK economy adjusted for changes in the quality of the labour supply.