



ECONOMY AND LABOUR MARKET

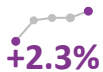
Labour Productivity Statistics

2018 Quarter 4 (October-December)

8 May 2019

This publication includes estimates of labour productivity for Scotland's onshore economy up to the final quarter of 2018, and the first annual estimate for 2018 as a whole.

Headline results



+2.3%

In 2018 Quarter 4, labour productivity in Scotland, measured by output per hour worked, has increased by 2.3% compared to the same quarter last year.



+0.5%

Compared to the previous quarter, labour productivity is estimated to have grown by 0.5% in 2018 Quarter 4, following zero growth (0.0%) in the previous quarter.



+3.8%

In 2018, annual labour productivity increased by 3.8% compared to 2017, following decreases of 0.3% in 2017 and 1.3% in 2016.

What's included in this release?

Labour productivity measures the amount of economic output that is produced, on average, by each unit of labour input, and is an important indicator of economic performance.

This publication contains a brief summary of the key results from the latest productivity statistics, focussing in on the headline measures of change in output per hour worked.

The key results are presented in real terms, i.e. where the effect of price changes has been removed to allow for meaningful comparisons over time. Estimates are for Scotland's onshore economy.

The topical section in this release presents new analysis which helps to break down the growth in productivity based on changes within industries and the labour force.

Data

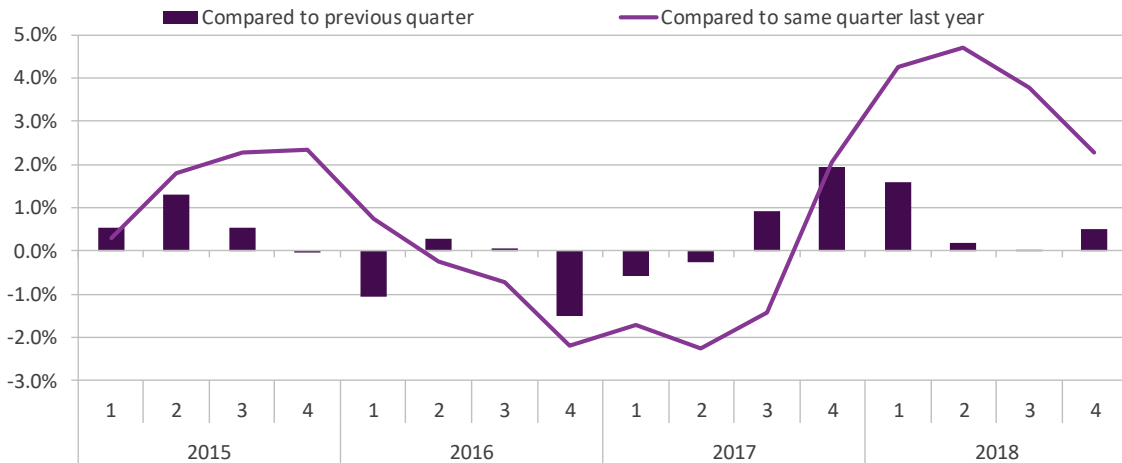
Full results including estimates of output per job, current price productivity measures (not adjusted for price changes) and experimental estimates of labour productivity by industry are available in [online tables](#).

In 2018 Q4, productivity has grown by 2.3% compared to the same quarter in 2017

Compared to the fourth quarter of 2017, labour productivity has increased by 2.3% in real terms. The growth rate over the year is based on how much output per hour worked has changed in total across the latest four quarters.

Compared to the previous quarter, labour productivity is estimated to have grown by 0.5% in 2018 Quarter 4, following zero growth (0.0%) in the previous quarter.

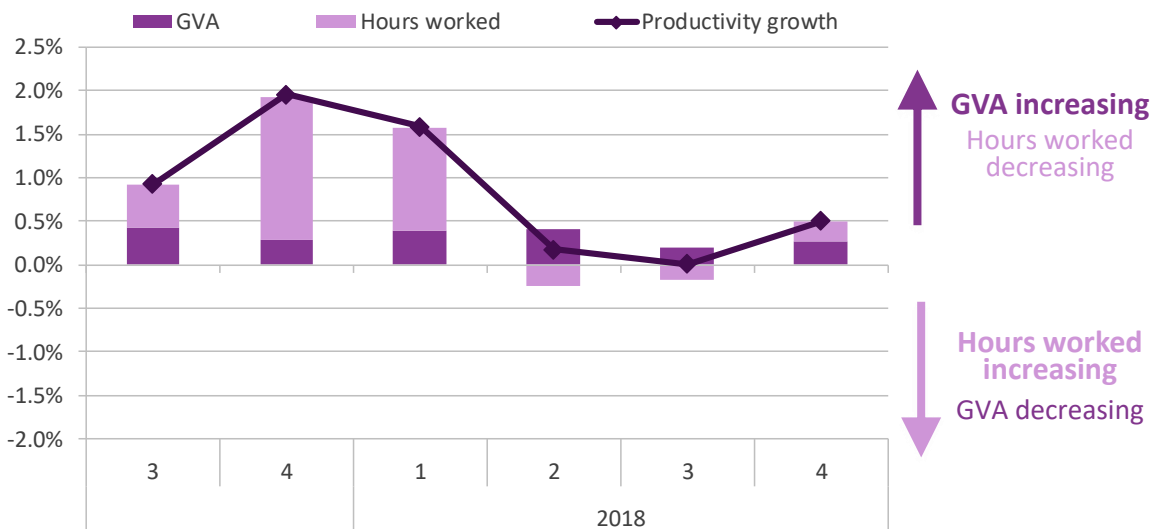
Output per hour worked, percentage change



Changes in productivity can be simply broken down into growth in output (GVA) *minus* growth in total hours worked. Therefore, when output grows faster than hours, productivity increases.

In the latest quarter, output per hour increased by 0.5% due a combination of positive GVA growth (0.3%) and a fall in the total number of hours worked (-0.2%). While GVA growth has been relatively steady over 2018, the number of hours worked has fallen back after increasing strongly in 2017.

Quarterly growth in productivity, output and hours worked

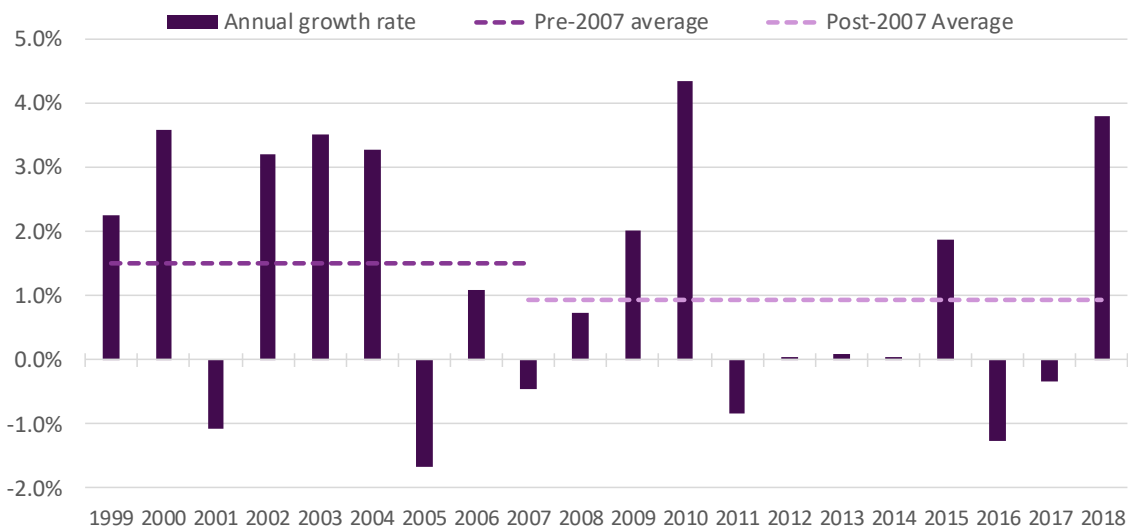


Annual productivity grew 3.8% in 2018, after falling in 2016 and 2017

In 2018, output per hour worked in Scotland increased by 3.8% in real terms compared to 2017. The annual labour productivity growth rate is based on results for the whole year compared to the previous year. This follows decreases of 0.3% in 2017 and 1.3% in 2016.

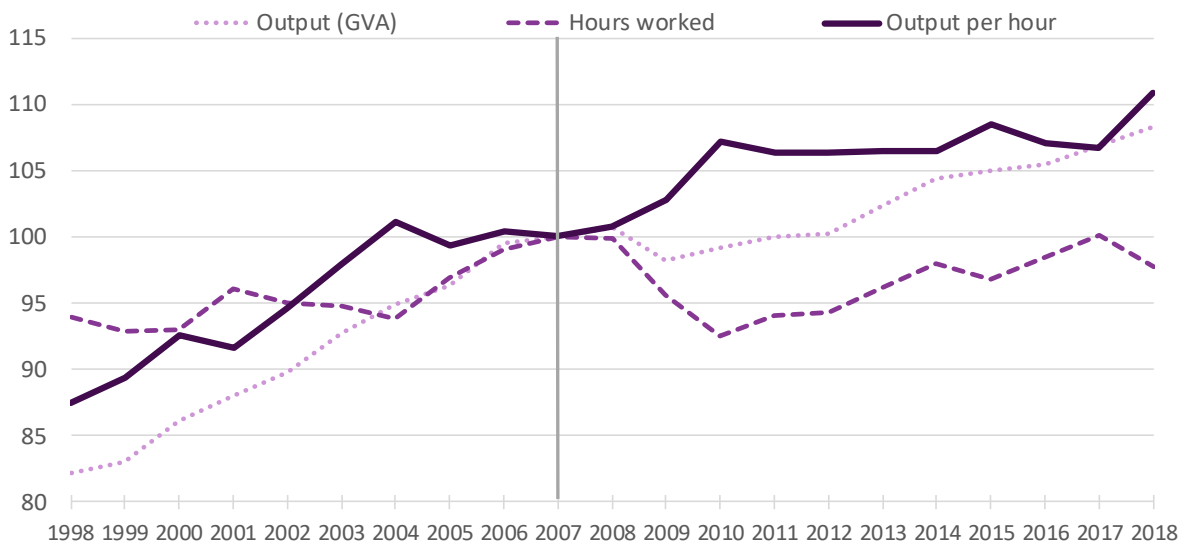
Annual productivity growth can vary widely from year to year, but looking over the longer term it has grown by an average of 0.9% per year since the onset of the 2008-09 recession. Prior to the recession, from 1998 to 2007, output per hour worked increased by 1.5% per year on average.

Output per hour, percentage change compared to the previous year



Since 2007, average productivity growth has been similar to average growth in output, but has followed a very different path. Whilst GDP quickly recovered to above its pre-recession peak and is now 8.3% higher, total hours worked in the economy fell more steeply during the recession and remain below pre-recession levels despite record levels of employment. This is because average hours per job have fallen, partly due to an increase in part time working.

Levels of productivity, output, hours , 1998-2018



Topical Section: What has been driving labour productivity growth

Increases in overall labour productivity can be due to a combination of different factors, including *pure productivity* improvements within industries and the *allocation effect* of changes to the structure of the economy. These effects can be broken down and analysed using the 'Generalised Exactly Additive Decomposition' (GEAD) methodology¹. This release introduces this methodology and includes some examples of how such labour productivity decomposition analysis can be used.

Industry contributions to total productivity growth, 2018

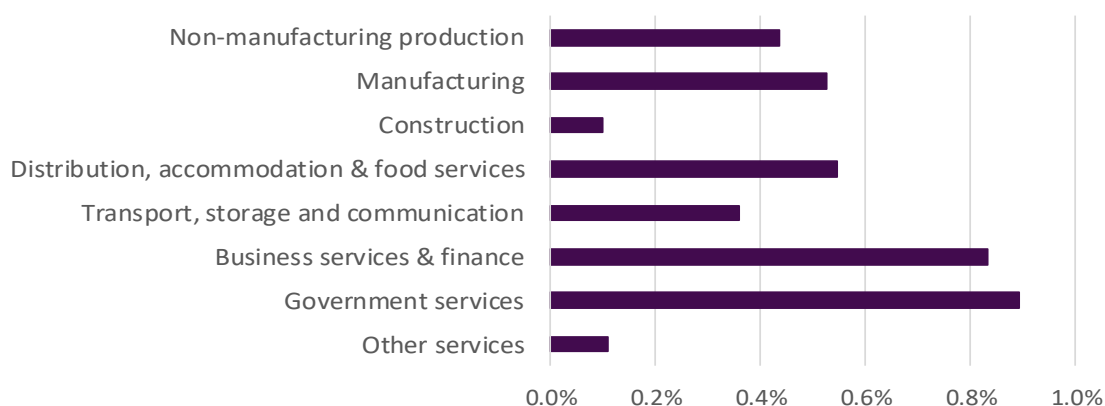
The table below shows the 2018 annual productivity growth rates for each broad industry group, alongside their contributions to total growth in percentage points. Whilst labour productivity growth rates are not additive, the contributions in the table are additive both vertically (summing to the whole economy) and horizontally (summing to the total contribution for each industry).

	Labour productivity growth	Contributions*		
		Total	Pure	Allocation
Non-manufacturing production	6.3%	0.4%	0.5%	-0.1%
Manufacturing	8.3%	0.5%	0.9%	-0.3%
Construction	-1.1%	0.1%	-0.1%	0.2%
Distribution, accommodation & food services	4.6%	0.5%	0.6%	-0.1%
Transport, storage and communication	8.5%	0.4%	0.7%	-0.3%
Business services & finance	2.8%	0.8%	0.8%	0.1%
Government services	-0.2%	0.9%	-0.0%	0.9%
Other services	17.3%	0.1%	0.6%	-0.5%
Whole Economy	3.8%	3.8%	4.0%	-0.2%

*contributions may not appear to sum due to rounding to 1 decimal place

In 2018, all eight of the broad industry groups made a positive contribution to total productivity growth, with government services (0.9 p.p.) and business services & finance (0.8 p.p.) making the largest contributions to total growth.

Industry contributions to total productivity growth, 2018



¹ Tang J and Wang W (2004), 'Sources of aggregate labour productivity growth in Canada and the United States', Journal of Economics, Volume 37, Number 2.

Interesting features highlighted by this analysis include:

- For the whole economy, there was an overall negative effect from the allocation of resources (i.e. hours worked). This signals a small shift in the labour force from relatively higher productivity industries to lower productivity industries.
- The Construction and Government Services sectors both made a positive contribution to productivity growth in 2018 despite their pure productivity actually falling in the latest year. This may appear counterintuitive at first, but is because the relative size of these industries has increased in the latest year, which outweighed the small falls in their productivity – this behaviour is seen as a positive allocation effect.

The scope for potential analysis using the GEAD methodology is vast and in the coming months we aim to publish more detailed information on the methodology and some new insights including a longer term trend analysis of industry contributions to productivity growth and how the re-allocation of resources has influenced productivity growth pre- and post-recession.

How to interpret industry contributions to total productivity growth

Industry contributions to productivity growth can sometimes appear counterintuitive. For example, productivity growth within an industry does not necessarily translate into a positive contribution to aggregate productivity growth. To understand why it is important to think about how the re-allocation of hours worked from one industry to another effects both the industry in question and total productivity growth for the economy as a whole.

For a given industry, its contribution to total growth is a combination of pure productivity advancement (excluding the effects of changing labour shares) and an allocation effect which can broadly be thought of as the effect of changing labour shares weighted by the level of productivity within that industry.

Imagine a simplified economy with only two industries where over time, the number of hours worked in services (low level of productivity) increases and the number of hours worked in manufacturing (high level of productivity) correspondingly decreases.

The allocation effect for services will be positive because more hours are now being worked to produce services. However, because services is a low productivity industry the allocation effect is weighted downwards (but importantly, still positive).

The allocation effect for manufacturing is negative because hours worked are lost. This negative effect is amplified because these hours have been lost in a high productivity industry. When added together, the downside of losing high productivity hours outweighs the positive effect of gaining low productivity hours and thus the allocation effect for the whole economy is negative.

About Labour Productivity Statistics

Labour productivity measures the amount of economic output that is produced, on average, by each unit of labour input, and is an important indicator of economic performance.

Labour input is measured in terms of the number of jobs in the economy (giving a measure of output per job), and also the total number of hours worked (giving a measure of output per hour worked). Output per hour worked is usually viewed as the most comprehensive indicator of labour productivity and is thus taken as the headline measure.

Labour productivity statistics presented in **real terms** (where the effects of price changes have been removed) are used to analyse changes in the level of activity over time within a particular country or industry, or to compare growth rates between countries or industries on a consistent basis. Results are indexed to a reference year – set at 2007=100 in this release in order to focus on movements since the onset of the recession in 2008.

Results presented in **current prices** (unadjusted for the effects of price changes) are used to make comparisons of the relative level (not growth rate) between countries or industries at a particular point in time.

Quarterly movements of labour productivity can be volatile, making short term trends difficult to discern. To aid interpretation, quarterly estimates of productivity growth are calculated using a trend-based labour input series. The quarterly estimates presented indicate the underlying rate of change after removing both seasonal and irregular (volatile) movements from the data.

Further information on the production and interpretation of these statistics is available [here](#).

What's changed in this release?

In line with other economic measures in Scotland and to aid comparability with the UK as a whole, this release reports on growth between the latest quarter and the same quarter a year ago.

Labour productivity estimates are derived using simple calculations on other source statistics and any revisions to these sources of data have a consequent impact on the productivity estimates.

This release reflects revisions to jobs and hours data published by the Office for National Statistics (ONS) affect all time periods. The latest two quarters of the trend-based measure of productivity are subject to potential revision as new data become available. The cumulative effect of these revisions is presented in the online revision tables.

There have been further developments to the experimental industry level productivity estimates, which are now presented with more detail than before. There have been revisions to the results previously published.

Next publication

Labour Productivity Statistics, 2019 Quarter 1

14 August 2019



An Official Statistics publication for Scotland

These statistics have not been assessed by the Office for Statistics Regulation and are therefore not yet been designated as National Statistics.

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