

Statistical bulletin

# Index of Production: April 2015

Movements in the volume of production for the UK production industries: manufacturing, mining and quarrying, energy supply, and water and waste management. Figures are seasonally adjusted.



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# 1 . Main points

- Total production output is estimated to have increased by 1.2% in April 2015 compared with April 2014. There were increases in all 4 main sectors, with the largest contribution coming from mining & quarrying, which increased by 6.2%
- Manufacturing output increased by 0.2% in April 2015 compared with April 2014. The largest contribution to the increase came from the manufacture of transport equipment
- Total production output is estimated to have increased by 0.4% in April 2015 compared with March 2015. There were increases in 2 of the 4 main sectors, with the largest contribution coming from mining & quarrying, which increased by 5.6%
- Manufacturing output decreased by 0.4% in April 2015 compared with March 2015. The largest contribution to the decrease in manufacturing came from basic pharmaceutical products & pharmaceutical preparations
- In the 3 months to April 2015, production and manufacturing were 9.5% and 4.4% respectively below their figures reached in the pre-downturn gross domestic product (GDP) peak in Quarter 1 (Jan to Mar) 2008
- In this release, the earliest period open for revision was January 2014, in line with the National Accounts revisions policy. There was minimal impact on previously published GDP estimates resulting from revisions to these periods

# 2 . Main figures

This bulletin presents the monthly estimates of the Index of Production (IoP) for the UK production industries, April 2015. The IoP is one of the earliest indicators of growth and it measures output in the manufacturing (the largest component of production), mining & quarrying, energy supply and water supply & waste management industries. The production industries account for 14.6% of the [output approach to the measurement of gross domestic product](#).

IoP values are referenced to 2011 so that the average for 2011 is equal to 100. Therefore, currently an index value of 110 would indicate that output is 10% higher than the average for 2011. The index estimates are mainly based on a monthly business survey (MBS) of approximately 6,000 businesses, covering all the territory of the UK without geographical breakdown. The total IoP estimate and various breakdowns are widely used in private and public sector institutions. Care should be taken when using the month-on-month growth rates due to their volatility. All figures contained within this release are seasonally adjusted estimates, unless otherwise stated.

Table 1 shows the main figures for this release. Figure 1 shows the production and manufacturing series from January 2013 to April 2015. This release also presents the economic context to the IoP; GDP impact and components; a supplementary analysis to the IoP; industry spotlight; and a background notes section for an assessment of the quality of the IoP, as well as an explanation of the terms used in this bulletin.

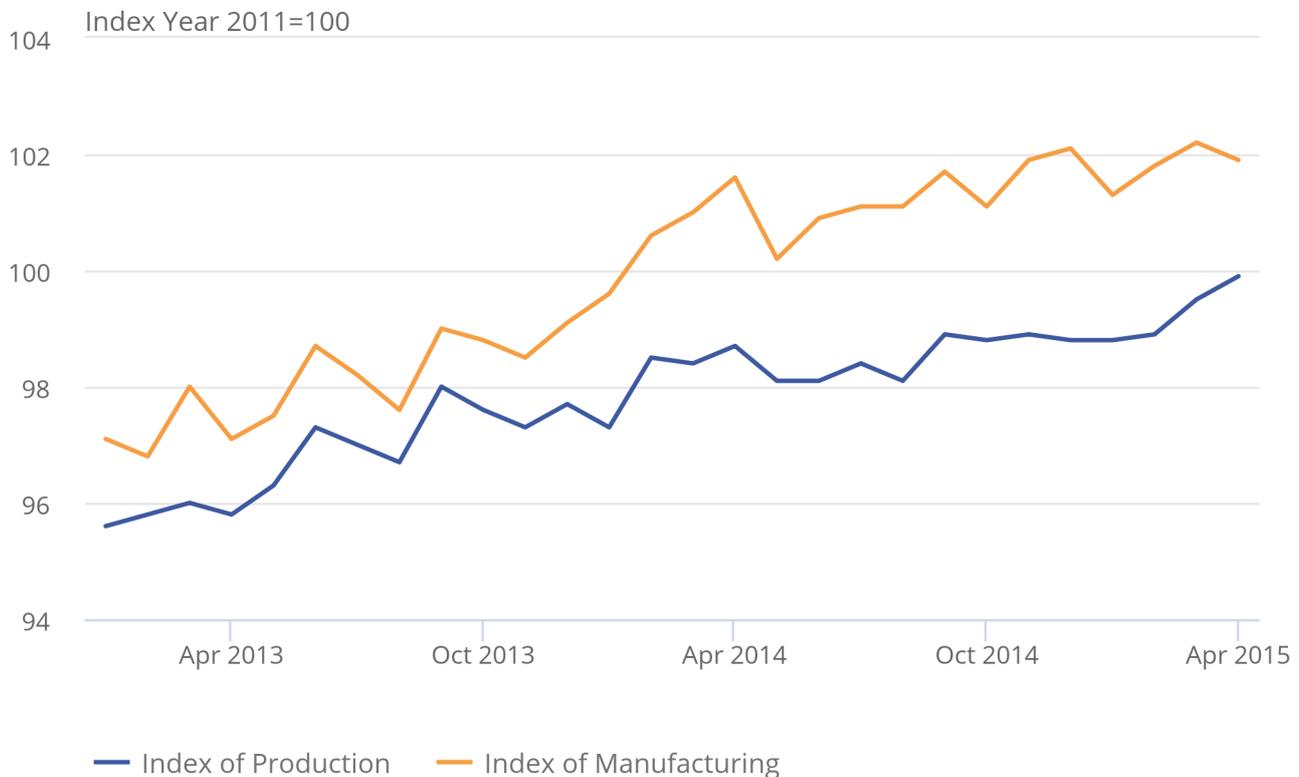
**Table 1: Index of Production main figures, April 2015, UK**

	Index number 2011=100	Most recent month on a year earlier	Most recent 3 months on a year earlier	Most recent month on previous month	Most recent 3 months on previous 3 months
Production	99.9	1.2	0.9	0.4	0.6
Manufacturing	101.9	0.2	0.9	-0.4	0.2

Source: Primarily Monthly Business Survey (Production and Services) - Office for National Statistics

**Figure 1: Seasonally adjusted production and manufacturing, January 2013 to April 2015, UK**

Figure 1: Seasonally adjusted production and manufacturing, January 2013 to April 2015, UK



Source: Primarily Monthly Business Survey (Production and Services) - Office for National Statistics

### 3 . Quality of the Index of Production

We have developed [guidelines for measuring statistical quality \(1.22 Mb Pdf\)](#) ; these are based upon the 5 European statistical system (ESS) quality dimensions. The IoP in its current form adheres to these requirements. One important dimension for measuring statistical quality is accuracy. That is, the extent to which the estimate measures the underlying "true" value of the output growth (of the production industries) in the UK for a particular period. Although the IoP meets its legal requirements for statistical accuracy, still as in all survey-based estimates, by definition, its estimates are subject to statistical uncertainty or errors. These errors consist of 2 main elements; the sampling error and the non-sampling error.

For many well-established statistics we measure and publish the sampling error associated with the estimate, using this as an indicator of accuracy. The IoP however, is constructed from a variety of data sources, some of which are not based on random samples. As a result, we currently do not publish a measure of the sampling error associated with the IoP underlying data, mainly the monthly business survey (MBS). However, research is currently under way to attempt to measure the standard error and the results of this will be published on completion.

Non-sampling errors are not easy to quantify but can be caused by coverage issues, measurement, processing and non-response. The response rate gives an indication of the likely impact of non-response error on the survey estimates. From January 2015, the MBS response rates for data included in the IoP publication were published in the background methods section of the statistical bulletin. This is to give further information of the percentages of the amount of turnover and questionnaire forms returned. We also publish MBS historical response rates back to 2010.

A further dimension of measuring accuracy is reliability, which can be measured using evidence from analyses of revisions to assess the closeness of early estimates to subsequent estimated values. Revisions are an inevitable consequence of the trade-off between timeliness and accuracy. Figures for the most recent months are provisional and subject to revision in light of:

- late responses to surveys and administrative sources
- forecasts being replaced by actual data
- revisions to seasonal adjustment factors, which are re-estimated every month and reviewed annually

Revisions to the IoP are typically small (around 0.1 to 0.2 percentage points), with the frequency of upward and downward revisions broadly equal. Further information on the most recent revisions analysis can be found in the revisions to IoP section and in the [revision triangles \(4.45 Mb ZIP\)](#) section in the bulletin background note.

It should be noted that care should be taken when using the month-on-month growth rates, due to their volatility. Further information on the latest quality and methodology information (QMI) for the IoP can be found in the QMI paper. Furthermore, the IoP is constantly being reviewed and improved for accuracy and uncertainty as part of the GDP(O) improvement project; further details of improvements are published each year as part of a suite of Blue Book articles. A full list of the GDP(O) improvement project articles can be found on the [Improvements](#) page of our website.

## 4 . Economic context

Figure 2 shows that the pace of growth in manufacturing exceeded that of total production between 2003 and 2006. This trend was, however, temporarily interrupted following the economic downturn in 2008, when manufacturing fell by a greater extent than total production.

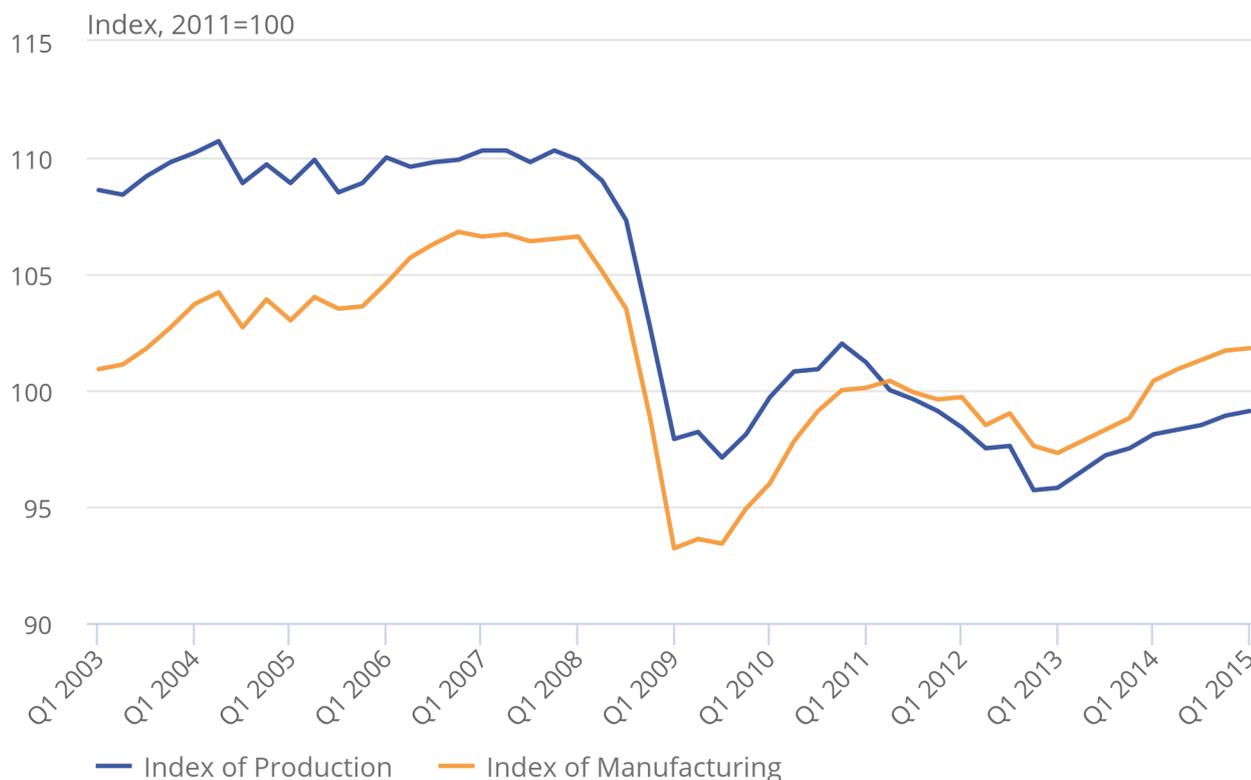
Following the 2008 to 2009 downturn, total production and manufacturing returned to growth for a short period, before falling again in 2011 and 2012. This coincided with falling gross domestic product (GDP) in the euro area. Total production was particularly affected, falling below its downturn trough in Quarter 4 (Oct to Dec) 2012, while manufacturing fell by a smaller amount.

For production and manufacturing, conditions have improved since the start of 2015. The [Second Estimate](#) reported that GDP rose by 0.3% in Quarter 1 (Jan to Mar) 2015, marking a ninth consecutive quarter of expansion, mainly due to the services industries which grew by 0.4% on the quarter. Looking at the other components of GDP, agriculture experienced a 0.2% contraction in output, while construction fell by a marked 1.1%, a second successive quarter of decline.

The production industry continued to show growth on an annual basis. Output was 1.0% higher in Quarter 1 (Jan to Mar) 2015 compared with Quarter 1 (Jan to Mar) 2014 with manufacturing 1.4% higher, however this does represent the weakest quarter-on-year growth since Quarter 3 (July to Sep) 2013 and Quarter 4 (Oct to Dec) 2013 respectively.

**Figure 2: Quarterly seasonally adjusted production and manufacturing, Quarter 1 (Jan to Mar) 2003 to Quarter 1 (Jan to Mar) 2015, UK**

Figure 2: Quarterly seasonally adjusted production and manufacturing, Quarter 1 (Jan to Mar) 2003 to Quarter 1 (Jan to Mar) 2015, UK



**Source: Primarily Monthly Business Survey (Production and Services) - Office for National Statistics**

**Notes:**

1. Throughout this chart Q1 refers to Quarter 1 (January to March), Q2 refers to Quarter 2 (April to June), Q3 refers to Quarter 3 (July to September) and Q4 refers to Quarter 4 (October to December)

According to the recent GDP bulletin, headline GDP surpassed its pre-downturn peak in Quarter 3 (July to Sep) 2013 and services (which account for over 78% of total GDP) remained the only headline industry to do so. Output in the production and construction industries in Quarter 1 (Jan to Mar) 2015 remained below levels experienced just before the onset of the downturn, by 10.3% and 8.0% respectively (according to the Second Estimate of GDP). Manufacturing output has performed more favourably compared with these industries; however output still remained 4.8% below pre-downturn levels.

The recent period of rising manufacturing output has coincided with low price inflation in the manufacturing industry, both in terms of the prices manufacturers pay for materials and fuels used in the production process (input prices) and the prices they charge for the goods they produce (output prices). We publish both measures in the [Producer Price Inflation bulletin](#). Input prices marked their 18th successive month of deflation in the year to April 2015, with prices falling by 11.7%, although this was up from a fall of 12.8% in the year to March 2015. Output prices have also experienced deflation, falling by 1.7% on an annual basis, unchanged from the previous two months.

## International perspective

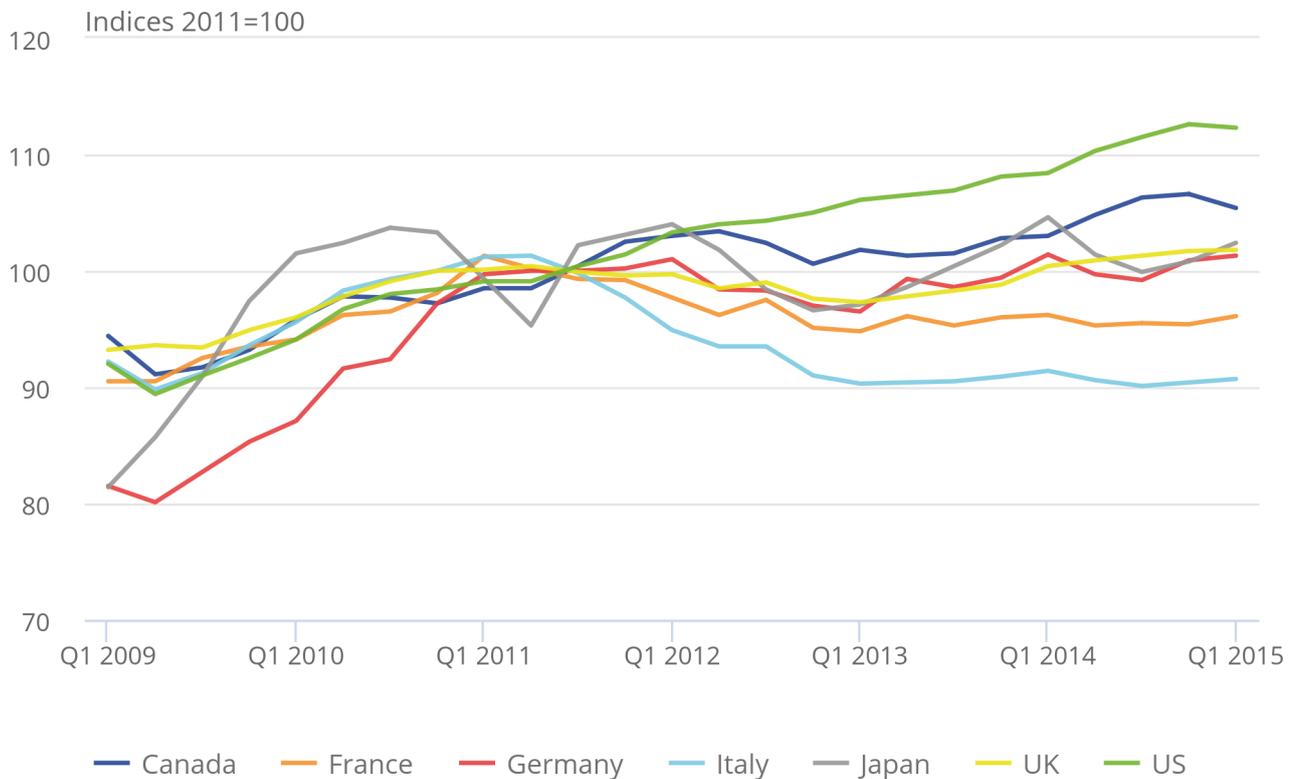
Globally, the performance of manufacturing output has varied across G7 nations since the onset of the economic downturn (Figure 3). Japan experienced the largest average annual fall in output over 2008 and 2009 (12.5% per annum), whereas the smallest decline was in the UK (6.1% per annum).

Following the 2008 to 2009 economic downturn, all [G7 nations' manufacturing](#) industries returned to growth. However, except for the USA, all members experienced further declines between the second half of 2012 and the first half of 2013, particularly in Italy and Japan. More recently, in Quarter 1 (Jan to Mar) 2015, France, Germany, Italy, Japan and the UK experienced growth in manufacturing output, although this has been to varying degrees. Japan experienced the strongest growth on a quarterly basis (1.6% ), France and Germany grew by 0.8% and 0.5% respectively, while growth was relatively modest in Italy and the UK. Canada and the USA both experienced a decline in manufacturing output, the former by a marked 1.1%.

For most member states, manufacturing output remained below their respective pre-downturn levels experienced in 2007. Output in Italy, France and Japan remained a marked 23.3%, 15.5% and 12.7% below respective pre-downturn levels . However, in Quarter 3 (July to Sep) 2014, the USA did surpass its pre-downturn level and exceeded it by 1.3% in Quarter 1 (Jan to Mar) 2015, while Germany was also above its respective pre-downturn level, by 2.5%.

**Figure 3: Quarterly international manufacturing output, Quarter 1 (Jan to Mar) 2009 to Quarter 1 (Jan to Mar) 2015**

Figure 3: Quarterly international manufacturing output, Quarter 1 (Jan to Mar) 2009 to Quarter 1 (Jan to Mar) 2015



**Source: OECD/ONS**

**Notes:**

1. Throughout this chart Q1 refers to Quarter 1 (January to March), Q2 refers to Quarter 2 (April to June), Q3 refers to Quarter 3 (July to September) and Q4 refers to Quarter 4 (October to December)
2. Data for the UK are consistent with the April ONS Index of Production bulletin, while data for all other remaining G7 economies have been sourced from OECD

Figure 4 presents month-on-year percentage growth rates in 8 of the 13 UK manufacturing sub-industries for March 2015, alongside comparable growth rates achieved in Germany, France, Italy and the euro area. This shows that the UK experienced slightly slower manufacturing growth at 1.2%, compared to total euro area manufacturing growth of 1.5%. Manufacturing output fell in Germany by 0.7%, while France and Italy both experienced rising output over the same period.

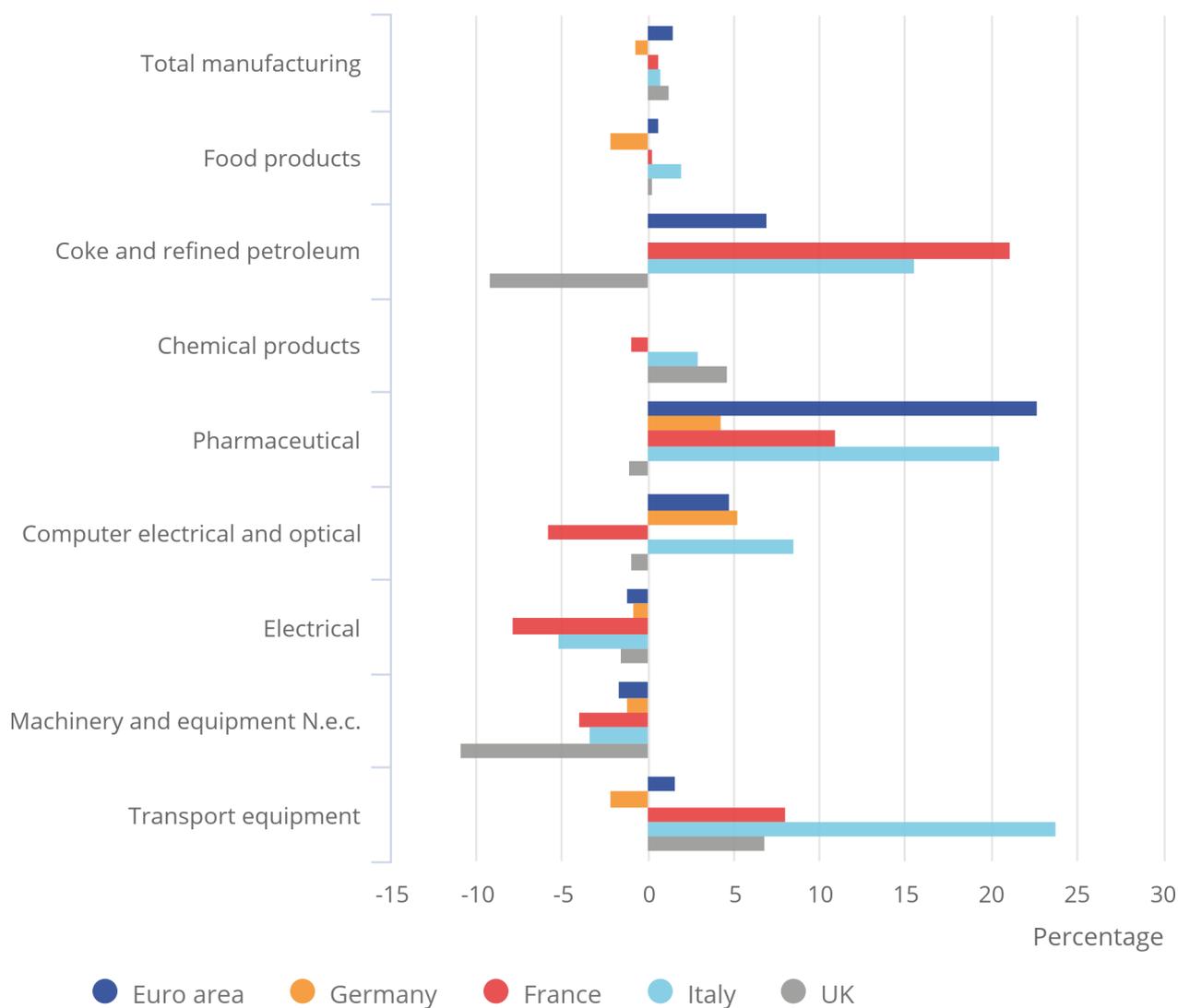
Figure 4 shows that the UK's comparable strength is currently concentrated in the manufacture of chemical products; partially offset by relative weakness in the manufacture of 'coke & refined petroleum products' as well as 'machinery and equipment not elsewhere classified'. The latter includes general purpose machinery such as engines, turbines, pumps, compressors and gears among other products.

**Figure 4: Month on a year ago manufacturing sub-industry percentage growth in the UK and the euro area**

March 2015 compared with March 2014

Figure 4: Month on a year ago manufacturing sub-industry percentage growth in the UK and the euro area

March 2015 compared with March 2014



Source: Eurostat/ONS

Notes:

1. Data for the UK are consistent with the March ONS Index of Production bulletin, while data for all other remaining economies have been sourced from Eurostat

## 5 . Gross domestic product (GDP) impact and components

In this release, the earliest period open for revision was January 2014, in line with the [National Accounts revisions policy \(43.3 Kb Pdf\)](#).

The estimates for the production industries are generally the first of the main components for the output approach to the measurement of GDP to be published (agriculture, [construction](#) and [services](#) are the other components). All the components are already available for Quarter 1 (Jan to Mar) 2015. Details of the data already published can be found in Table 2. [The Retail Sales Index](#) reported in Table 2 is not a direct component of the output approach to measuring GDP. It does, however, feed into estimates of GDP in 2 ways. Firstly, it feeds into the services industries when GDP is measured from the output approach. Secondly, it is a data source used to measure household final consumption expenditure which feeds into GDP estimates when measured from the expenditure approach.

Output in the construction industry for April 2015 will be published on 12 June 2015 and services output for the same period on 30 June 2015.

**Table 2: GDP component table, April 2015, UK**

Publication	Percentage of GDP	Release date	Month or quarter of GDP	Most recent 3 months on a year earlier	Most recent 3 months on 3 months earlier	Percentage change	
						Most recent month on the same month a year ago	Most recent month on the previous month
Index of Production <sup>1</sup>	14.6	10 Jun	Apr	0.9	0.6	1.2	0.4
			Mar	1.0	0.2	1.1	0.6
Construction	6.4	15 May	Mar	-0.3	-1.1	1.6	3.9
Index of services	78.4	28 May	Mar	3.0	0.4	2.8	0.1
			Feb	3.3	0.7	3.2	0.3
Retail sales		21 May	Apr	4.6	0.7	4.7	1.2
			Mar	5.1	0.9	4.0	-0.7
Agriculture	0.6	28 May	Q1	0.9	-0.2	..	..

Source: Office for National Statistics

Notes:

1. The data for the index of production reflects the latest revisions published as part of this release

## 6 . Production and sectors supplementary analysis

**Table 3: Headline growth rates and contributions to the Index of Production, April 2015, UK**

Description	Percentage of production	Month on same month a year ago growth (Percentage)	Contribution to production (Percentage points)	Month on previous month growth (Percentage)	Contribution to production (Percentage points)
IoP	100.0	1.2	1.2	0.4	0.4
Sector B	15.7	6.2	0.85	5.6	0.77
Division 06	12.9	9.8	0.98	8.7	0.87
Sector C	69.4	0.2	0.15	-0.4	-0.25
Sector D	7.1	0.6	0.04	-3.3	-0.22
Sector E	7.9	2.2	0.18	0.9	0.07

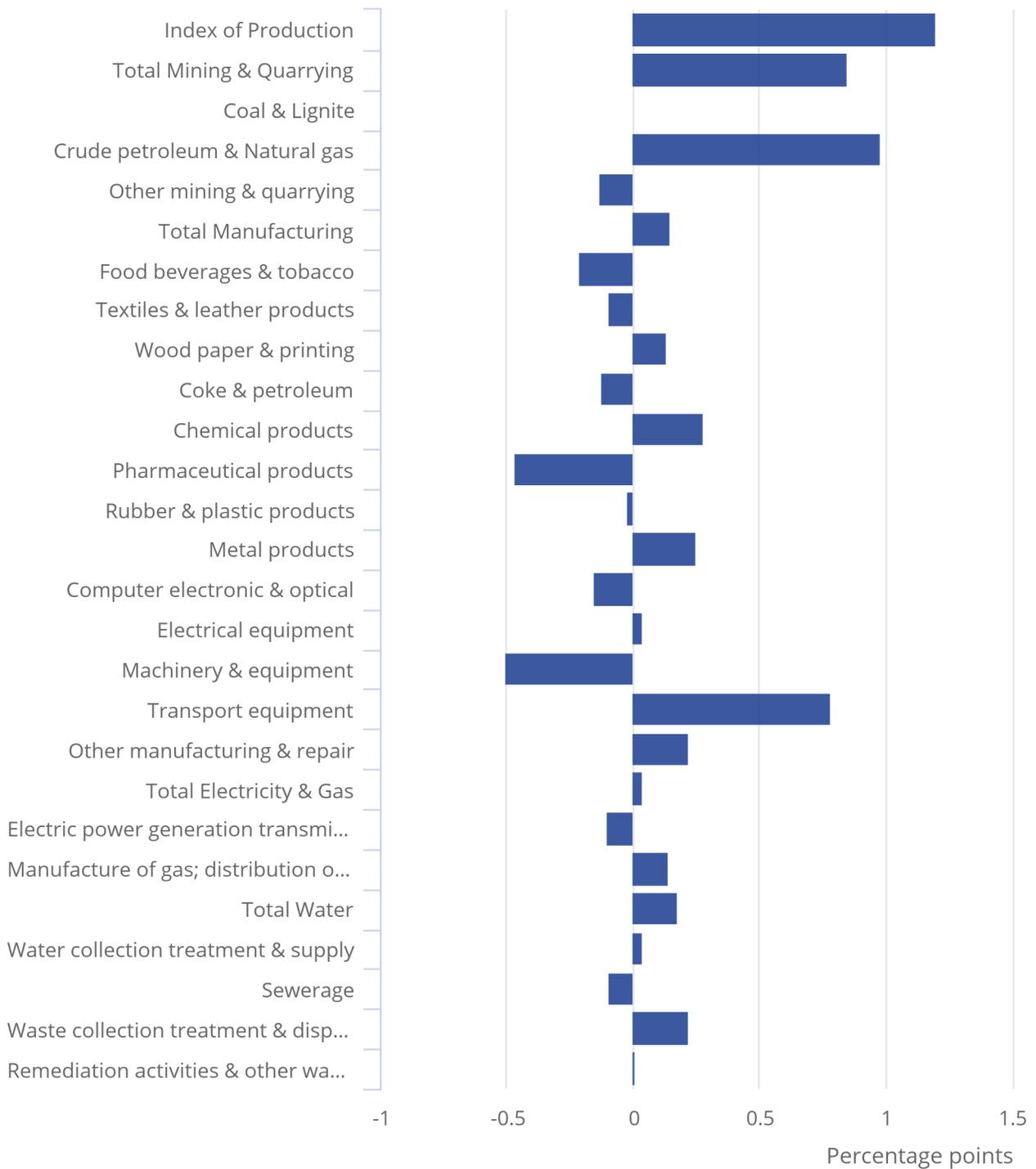
Source: Office for National Statistics

Notes:

1. Headline figures for the Index of Production are: Total Index of Production; Sector B Mining & quarrying; and within this Division 06 Oil & gas extraction; Sector C Manufacturing; Sector D Electricity, gas, steam & air conditioning; and Sector E Water supply, sewerage & waste management

**Figure 5: Contribution to production percentage growth, between April 2014 and April 2015, UK**

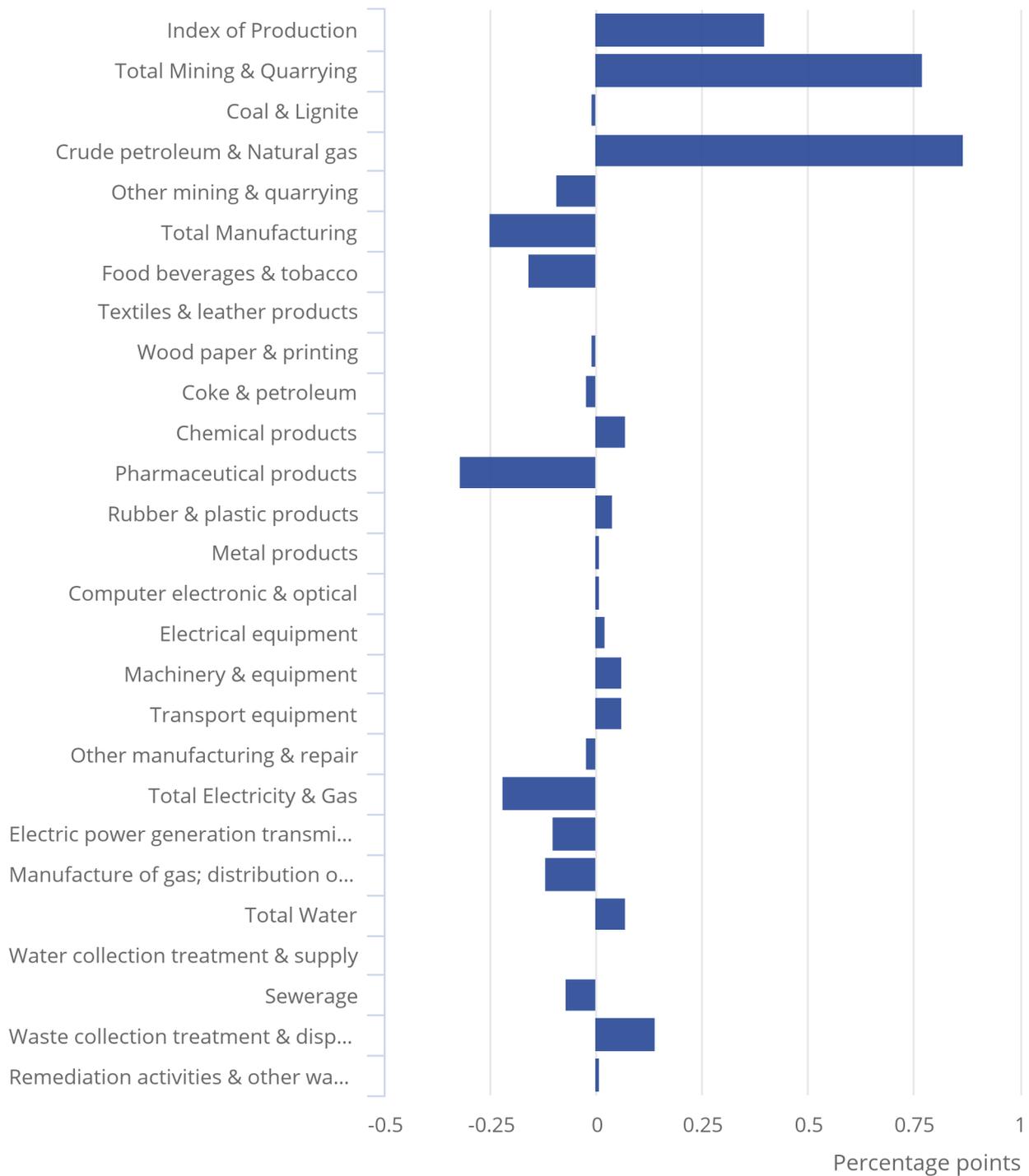
Figure 5: Contribution to production percentage growth, between April 2014 and April 2015, UK





**Figure 6: Contribution to production percentage growth, between March 2015 and April 2015, UK**

Figure 6: Contribution to production percentage growth, between March 2015 and April 2015, UK



## Total production

Total production output in April 2015 increased by 1.2% compared with April 2014 (Table 3). This increase reflected rises in all of its 4 main sectors with mining & quarrying having the largest contribution, increasing by 6.2% and contributing 0.9 percentage points to total production. There were also increases in water supply, sewerage & waste management of 2.2%; in manufacturing of 0.2%; and in electricity, gas, steam & air conditioning output of 0.6%.

Between March 2015 and April 2015, total production increased by 0.4% (Table 3). There were increases in 2 of its 4 main sectors. The largest upward contributions came from mining & quarrying, which increased by 5.6% and contributed 0.8 percentage points and water supply, sewerage & waste management output, which increased by 0.9% and contributed 0.1 percentage points to total production. Partially offsetting the increases were decreases in manufacturing, which decreased by 0.4% and contributed 0.3 percentage points to total production and electricity, gas, steam & air conditioning output, which decreased by 3.3% and contributed 0.2 percentage points to total production (Figure 6).

## Manufacturing

Manufacturing output increased by 0.2% between April 2014 and April 2015 and contributed 0.2 percentage points to total production growth. Output increased in 6 of the 13 manufacturing sub-sectors compared with a year ago (Figure 5 for the contribution to production growth from each of the main sectors and sub-sectors). The manufacturing sub-sector with the largest upward contribution to total production growth was the manufacture of transport equipment, which increased by 6.4% and contributed 0.8 percentage points to total production. The main contributor within this sub-sector was the manufacture of air & spacecraft & related machinery, which increased by 15.1% and contributed 0.7 percentage points to total production. This was this industry's eighth consecutive increase compared with a year ago.

In contrast, the manufacturing sub-sector with the largest downward contribution to total production compared with a year ago was the manufacture of machinery & equipment not elsewhere classified, which decreased by 9.7% and contributed 0.5 percentage points to total production. This was the seventh consecutive decrease compared with a year ago and weakness in the global market was cited as a possible contributing factor.

Manufacturing output decreased by 0.4% between March 2015 and April 2015, having increased in March 2015 by 0.4%. There were decreases in 7 of the 13 manufacturing subsectors (Figure 6). The manufacturing sub-sector with the largest contribution to the decrease in total production was the manufacture of basic pharmaceutical products & pharmaceutical preparations, which decreased by 6.0% and had a downward contribution of 0.3 percentage points to total production. This weakness followed an increase in output of 6.8% in the previous month.

In contrast to the above decreases, the manufacturing sub-sector with the largest upward contribution to total production was the manufacture of chemicals & chemical products, which increased by 1.6% and contributed 0.1 percentage points to total production, having decreased by 1.2% the previous month.

## Mining and quarrying

Mining & quarrying output increased by 6.2% between April 2014 and April 2015 and contributed 0.9 percentage points to total production. The sub-sector with the largest upward contribution was the extraction of crude petroleum & natural gas, which increased by 9.8% and contributed 1.0 percentage points to total production (Figure 5). This was due to reported increases in crude oil production compared with last year when planned maintenance in a number of terminals hampered production.

Mining & quarrying output increased by 5.6% in April 2015 compared with March 2015. The sub-sector with the largest upward contribution was the extraction of crude petroleum & natural gas, which increased by 8.7% and contributed 0.9 percentage points to total production (Figure 6). This was due to increases in crude oil production and NGL (natural gas liquids) from the offshore pipelines and the offshore loaders in some of the North Sea terminals. Evidence from the Department of Energy and Climate Change (DECC) suggested the increases in crude oil production were in line with the rises seen in the global oil supply market.

## Electricity, gas, steam & air conditioning

Electricity, gas, steam & air conditioning output increased by 0.6% in April 2015 compared with April 2014 and had a negligible contribution to total production (Figure 5). This reflected an increase in output in 1 of its 2 sub-sectors, the manufacture of gas & distribution of gaseous fuels through mains, which increased by 7.2% and contributed 0.1 percentage points to total production. Anecdotal evidence suggested that the rise compared with a year ago was due to an increase in demand for gas for the purpose of generating electricity.

Electricity, gas, steam & air conditioning output decreased by 3.3% in April 2015 compared with March 2015 and contributed 0.2 percentage points to total production (Figure 6), having had a smaller decrease of 1.6% in the previous month. The decrease was in both of its sub-sectors, with the largest downward contribution coming from the manufacture of gas & distribution of gaseous fuels through mains, which decreased by 5.7% and contributed 0.1 percentage points to total production. Anecdotal evidence suggested that the monthly decrease in output was mainly attributed to a reduction in demand for domestic space heating and was in line with the usual fluctuations in this industry's output.

## Water & waste management

Water supply, sewerage & waste management output increased by 2.2% in April 2015 compared with April 2014 and contributed 0.2 percentage points to total production. This increase reflected a rise in 3 of its 4 sub-sectors' output (Figure 5), with largest upward contribution coming from waste collection, treatment & disposal activities, which increased by 6.6% and contributed 0.2 percentage points to total production.

Water supply, sewerage & waste management output increased by 0.9% between March 2015 and April 2015, the fourth consecutive increase since December 2014. This increase reflected a rise in 2 of its 4 sub-sectors (Figure 6), with the largest contribution coming from waste collection, treatment & disposal activities, which increased by 4.1% and contributed 0.1 percentage points to total production, having decreased by 1.0% in the previous month.

## Revisions to IoP

Revisions to the Index of Production follow the [National Accounts Revisions policy \(43.3 Kb Pdf\)](#). Revisions are caused by a number of factors including, but not limited to revisions to source data due to late responses to the monthly business survey (MBS), actual data replacing forecast data and revisions to seasonal factors that are re-estimated every period. We produce revisions triangles of production and manufacturing growth to provide users with an indication of the reliability of this key indicator. Statistical tests are performed on the average revision to test if it is statistically significantly different from zero. Further information can be found in background note 5.

In this release of data, the earliest period open for revision is January 2014. There were no revisions to IoP month-on-month growth rates greater than 0.1%. This resulted in minimal impact on previously published GDP estimates as a result of this revision. Further details on the revisions to IoP components can be found in the IoP5R tables, located within the data section of this release.

## 7 . Industry spotlight: Wood, paper products and printing

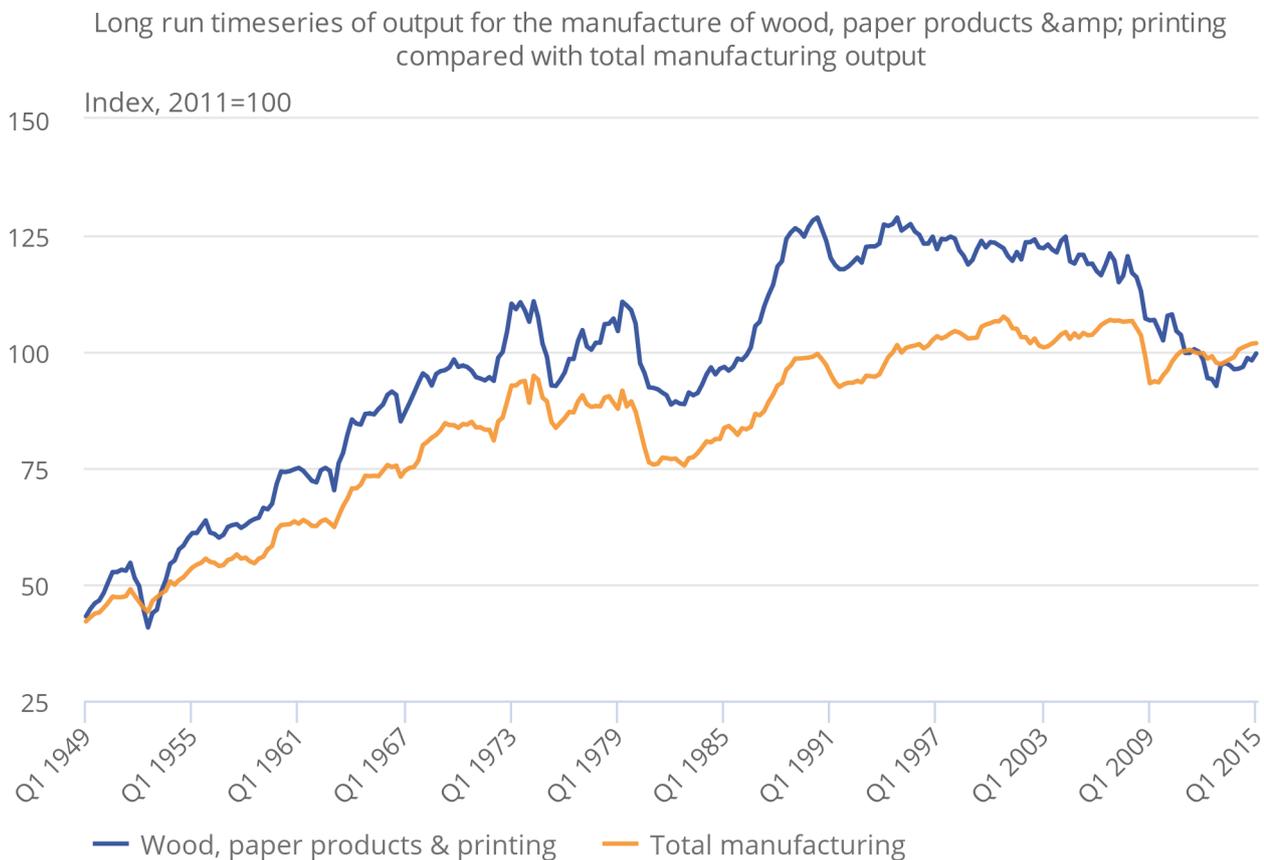
Industry CC covers “wood, paper products and printing” in the Index of Production data. The industry accounts for around 7.1% of manufacturing output. According to the Standard Industrial Classification (SIC07), this industry includes the manufacture of wood products (division 16), the manufacture of paper products (division 17) and the printing and reproduction of recorded media (division 18). Each sub-industry accounts for 19%, 35% and 46% of the total industry respectively.

A historical look at the “wood, paper products and printing” industry shows a trend that broadly follows total manufacturing output. The industry experienced strong growth from Quarter 1 (Jan to Mar) 1983 to its peak in Quarter 2 (Apr to June) 1990, rising at an average rate of 1.2% per Quarter. However, output in the industry then declined steadily before falling by 23.2% between Quarter 4 (Oct to Dec) 2007 and Quarter 4 (Oct to Dec) 2012. The subsequent recovery has been modest and output remains 17.3% below Quarter 4 (Oct to Dec) 2007 levels.

**Figure 7: Quarterly manufacturing output of wood, paper products and printing and total manufacturing, seasonally adjusted, Quarter 1 (Jan to Mar) 1949 to Quarter 1 (Jan to Mar) 2015, UK**

Long run timeseries of output for the manufacture of wood, paper products & printing compared with total manufacturing output

Figure 7: Quarterly manufacturing output of wood, paper products and printing and total manufacturing, seasonally adjusted, Quarter 1 (Jan to Mar) 1949 to Quarter 1 (Jan to Mar) 2015, UK



Source: Office for National Statistics

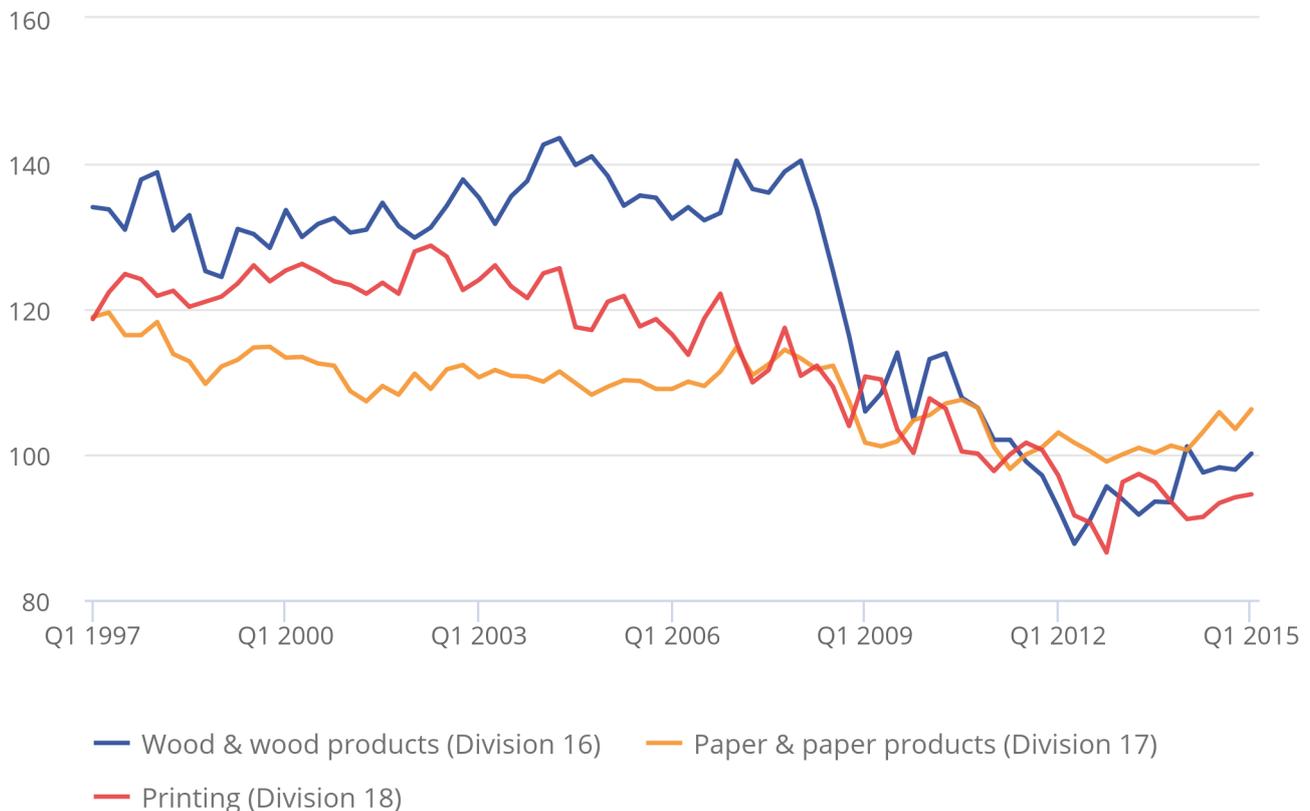
Notes:

1. Throughout this chart Q1 refers to Quarter 1 (January to March), Q2 refers to Quarter 2 (April to June), Q3 refers to Quarter 3 (July to September) and Q4 refers to Quarter 4 (October to December)

The quarterly paths of divisions 16, 17 and 18 since Quarter 1 (Jan to Mar) 1997 have been varied. Division 16 was particularly affected during the downturn, with output contracting by 37.5% between Quarter 1 (Jan to Mar) 2008 and Quarter 2 (Apr to June) 2012. The decline of division 17 over the period was relatively less marked, while division 18 shows a longer term decline. The latter could be attributed to structural factors such as a change in the way that we obtain news and other printed information, toward digital devices.

**Figure 8: Comparison between divisions 16, 17 and 18, Quarter 1 (Jan to Mar) 1997 to Quarter 1 (Jan to Mar) 2015, UK**

Figure 8: Comparison between divisions 16, 17 and 18, Quarter 1 (Jan to Mar) 1997 to Quarter 1 (Jan to Mar) 2015, UK



**Notes:**

1. Throughout this chart Q1 refers to Quarter 1 (January to March), Q2 refers to Quarter 2 (April to June), Q3 refers to Quarter 3 (July to September) and Q4 refers to Quarter 4 (October to December)

Many of the wood products produced by industry 16 are likely to be used in the construction industry, such as beams, doors and stairs among other products. For this reason, it is perhaps unsurprising that output growth in this industry broadly tracks movements in headline construction output, as shown in Figure 9. Compared with the same quarter of the previous year; output in industry 16 fell by 1.0% in Quarter 1 (Jan to Mar) 2015. This helps substantiate the recent construction figures, which show a 0.3% decline in output over the same period.

**Figure 9: Comparison of the manufacture of wood products with the output of the construction industry, Quarter 1 (Jan to Mar) 2003 to Quarter 1 (Jan to Mar) 2015**

Figure 9: Comparison of the manufacture of wood products with the output of the construction industry, Quarter 1 (Jan to Mar) 2003 to Quarter 1 (Jan to Mar) 2015



Source: Office for National Statistics

Notes:

1. Throughout this chart Q1 refers to Quarter 1 (January to March), Q2 refers to Quarter 2 (April to June), Q3 refers to Quarter 3 (July to September) and Q4 refers to Quarter 4 (October to December)

## 8. Background notes

### 1. What's new?

This [news article](#) from the International Energy Agency notes a rise in oil production.

[The Assessment of Short-Term Economic Output Indicators: Preliminary Estimate of GDP, Indices of Production and Services, and Retail Sales](#) has been published. See assessment report number 278 for further details.

On 7 January 2015, the following papers were published:

[Impact of quarterly employment question on monthly survey response \(163.7 Kb Pdf\)](#).

[Monthly Business Survey variance of change \(110 Kb Pdf\)](#).

We have implemented an updated version of the seasonal adjustment software called X-13-ARIMA-SEATS. The new version is in line with international best practice and is a change from the previously used version X-12-ARIMA. In practice, this will result in improved quality of outputs for seasonally adjusted estimates.

#### Upcoming changes

The Index of Production release for May 2015, to be published on 7 July 2015, will have a revisions period back to April 2015.

In September 2014 the industry review timetable was published as part of the [GDP\(O\) Improvement Report](#) - stating that during July 2015, 4 industry reviews would be published. However, the publication of these reviews will now be delayed. The 4 industry reviews are:

Professional services  
Water transport  
Social care  
Post and courier services

The National Accounts (NA) work plan will be published early summer, outlining future priorities for NA and this project. An update to users will follow the agreement of the NA work plan and will provide further information of the progress of industry reviews. Should you have any queries please contact us at [STOI.Development@ons.gov.uk](mailto:STOI.Development@ons.gov.uk).

### 2. Code of Practice for Official Statistics

National Statistics are produced to high professional standards set out in the [Code of Practice for Official Statistics](#). They undergo regular quality assurance reviews to ensure that they meet customer needs. They are produced free from any political interference.

### 3. Understanding the data

#### Short guide to the Index of Production

This statistical bulletin gives details of the index of output of the production industries in the United Kingdom. Index numbers of output in this statistical bulletin are on the base 2011=100 and are classified to the [2007 Standard Industrial Classification](#) (SIC). The production industries, which accounted for 14.6% of gross domestic product in 2011, cover mining & quarrying (Section B), manufacturing (Section C), gas & electric (Section D), and water supply & sewerage (Section E).

#### Interpreting the data

The non-seasonally adjusted series contain elements relating to the impact of the standard reporting period, moving holidays and trading day activity. When making comparisons it is recommended that users focus on seasonally adjusted estimates as these have the seasonal effects and systematic calendar related components removed.

Figures for the most recent months are provisional and subject to revision in light of:

- late responses to surveys and administrative sources
- revisions to seasonal adjustment factors which are re-estimated every month and reviewed annually (changes from the latest review are included in this release)

## Definitions and explanations

Definitions found within the main statistical bulletin are listed:

- chained volume measure - an index number from a chain index of quantity. The index number for the reference period of the index may be set equal to 100 or to the estimated monetary value of the item in the reference period
- index number - a measure of the average level of prices, quantities or other measured characteristics relative to their level for a defined reference period or location. It is usually expressed as a percentage
- seasonally adjusted - seasonal adjustment aids interpretation by removing effects associated with the time of the year or the arrangement of the calendar, which could obscure movements of interest

## Use of the data

The IoP is a key economic indicator and one of the earliest short-term measures of economic activity. The main output is a seasonally adjusted estimate of total production and broad sector groupings of mining & quarrying, manufacturing, energy and water supply & sewerage. The total IoP estimate and various breakdowns are widely used in private and public sector institutions, particularly the Bank of England, Her Majesty's Treasury and the Office for Budget Responsibility, to assist in informed policy and decision making.

## 4. Methods

An article about the [Index of Production methodology \(78.4 Kb Pdf\)](#) is available on our website.

### Composition of the data

The Index of Production uses a variety of different data from sources which are produced on either a quarterly or monthly basis.

Most of the series are derived using current price turnover deflated by a suitable price index. This includes the monthly business survey (MBS) data; Our short-term survey of various industries in the economy. It is one of the main data sources used in the compilation of the Index of Production.

Approximately 70% of the IoP estimates are based on data collected through the ONS monthly business survey (MBS). The remainder are based on data received from external sources. The MBS response rates for data included in this publication are presented in Table 4 for the current month and the 3 months prior. The response rates for the historical periods are updated to reflect the current level of response, incorporating data from late returns. Two response rates are included with one percentage for the amount of turnover returned and the other percentage for the amount of questionnaire forms. We have also published [MBS historical production industries response rates \(34 Kb Excel sheet\)](#) back to 2010.

**Table 4: Monthly business survey (MBS) Response Rates, April 2015, UK**

	Year	Period	Percentage	
			Turnover	Questionnaire
MBS overall	2015	Apr	87.9	75.4
		Mar	94.5	82.4
		Feb	96.9	85.5
		Jan	96.1	86.9
MBS production only	2015	Apr	88.5	78.2
		Mar	95.0	85.4

Feb	96.6	87.7
Jan	98.4	89.4

Source: Office for National Statistics

### Seasonal adjustment

The index numbers in this statistical bulletin are all seasonally adjusted. This aids interpretation by removing annually recurring fluctuations, for example, due to holidays or other regular seasonal patterns. Unadjusted data are also available.

Seasonal adjustment removes regular variation from a time series. Regular variation includes effects due to month lengths, different activity near particular events such as shopping activity before Christmas, and regular holidays such as the May bank holiday. Some features of the calendar are not regular each year, but are predictable if we have enough data, for example, the number of certain days of the week in a month may have an effect, or the impact of the timing of Easter. As Easter changes between March and April, we can estimate its effect on time series and allocate it between March and April depending on where Easter falls. Estimates of the effects of day of the week and Easter are used respectively to make trading day and Easter adjustments prior to seasonal adjustments.

Although leap years only happen every 4 years, they are predictable and regular and their impact can be estimated. Hence, if there is a leap year effect, it is removed as part of regular seasonal adjustment.

### Deflation

It is common for the value of a group of financial transactions to be measured in several time periods. The values measured will include both the change in the volume sold and the effect of the change of prices over that year. Deflation is the process whereby the effect of price change is removed from a set of values.

All series, unless otherwise quoted, are chained volume measures. Deflators adjust the value series to take out the effect of price change to give the volume series.

## 5. Quality

### Basic quality information

A common pitfall in interpreting data is that expectations of accuracy and reliability in early estimates are often too high. Revisions are an inevitable consequence of the trade off between timeliness and accuracy. Early estimates are based on incomplete data.

Very few statistical revisions arise as a result of "errors" in the popular sense of the word. 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. Only rarely are there avoidable "errors" such as human or system failures, and such mistakes are made quite clear when they do occur.

### Quality and methodology information report

A quality and methodology information report for this statistical bulletin can now be found on our website.

### Revision triangles

One indication of the reliability of the key indicators in this bulletin can be obtained by monitoring the size of revisions. Table 5 is based on the revisions which have occurred over the last 5 years. Please note that these indicators only report summary measures for revisions. The revised data may, themselves, be subject to sampling or other sources of error.

Table 5 presents a summary of the differences between the first estimates published between May 2008 and April 2014 and the estimates published 12 months later.

### Table 5: Revisions, April 2015, UK

Growth rates	Percentage change
	Revisions between first publication and estimates 12 months later

	Value in latest period	Average over the last 60 months	Average over the last 60 months without regard to sign (average absolute revision)
Production - 3 month	0.6	-0.15	0.29
Manufacturing - 3 month	0.2	-0.15	0.28
Production - 1 month	0.4	-0.11	0.27
Manufacturing - 1 month	-0.4	-0.08	0.27

Source: Office for National Statistics

[Spreadsheets give revisions triangles \(4.45 Mb ZIP\)](#) of estimates for all months from March 1998 through to the current month.

A statistical test has been applied to the average revisions to find out if they are statistically significantly different from zero. An asterisk (\*) indicates if a figure has been found to be statistically significant from zero.

The table uses historical data for the most recent 60 months, comparing the estimate at first publication with the estimate as published 12 months later. The numbers which underpin these averages include normal changes due to late data and re-seasonal adjustment, but also significant methodological changes, the most recent being the introduction of the 2007 standard industrial classification in October 2011.

The result presented in Table 5 suggests that the average revision for our 3 monthly estimates is not statistically significantly different from zero and that there are small downward revisions for our monthly production estimates over 12 months. In other words, the initial estimates for any given period provide a good indication of the later IoP estimates once more data have become available.

## 6. Publication policy

Details of the policy governing the release of new data are available from our media relations office. Also available is a [list of those given pre-publication access](#) to the contents of this release.

A complete set of series in the statistical bulletin are available to download free of charge on the [Datasets and Tables](#) of the Office for National Statistics website. Alternatively, for low-cost tailored data, call Online Services on 0845 601 3034 or email [Customer Contact Centre](#).

## 7. Accessing data

The complete run of data in the tables of this statistical bulletin is also available to view and download in electronic format free of charge using the [ONS Time Series Data service](#). Users can download the complete bulletin in a choice of zipped formats, or view and download their own selections of individual series.

We provide an [analysis of past revisions in the IoP and other statistical bulletins \(244.6 Kb Pdf\)](#) which present time series. Details can be found on our website.

We [publish revisions triangles \(65.8 Kb Pdf\)](#) for all the main published key indicators on our website.

## 8. Relevant links

In November 2014, [Government Statistical Service \(GSS\) uncertainty guidance](#) was published.

The Changing Shape of UK Manufacturing, an event coordinated jointly with the Department for Business, Innovation and Skills, took place on 22 October 2014. The event featured a range of talks from users, producers and suppliers of manufacturing statistics, not just from government, but also business representatives and academics. To view the content of the day, please visit [Storify](#).

[Disclosure control policy \(337 Kb Word document\)](#)

[The UK has one of the fastest growing economies in the G7](#)

We have [published a short story](#) describing how the pharmaceuticals industry has changed over time.

[Impact on National Accounts of Producer Price Index Rebasing](#)

On 17 September 2014 a [Summary of upcoming changes to GDP](#) was published.

An article titled [Impact of upcoming improvements on estimates of real and nominal annual and quarterly GDP: 1997 to 2012](#) was published on 3 September 2014.

On 31 October 2014, we published [updated methodology](#) for the IoP on the guidance and methodology web pages. The updated documentation includes a new and comprehensive source catalogue detailing the methods, data and weights used to compile IoP, IoS and GDP(O).

The [GDP Output Improvement Report](#), published on 30 September 2014, provides a detailed update of the implementation of improvements for Blue Book 2014, progress on industry reviews and wider cross-cutting improvements, a comprehensive timetable for the industry review project, an update of industry quality ratings and progress on experimental statistics.

On 6 November 2014 we published a short story looking at the changing shape of the UK aerospace manufacturing industry.

## 9. Customer feedback

We have received some comments from users regarding the Index of Production. These have mainly been in 3 areas and the bullet points detail the action we have taken, or plans to take, to address these concerns:

- users commented that longer timeseries would be useful so [long run timeseries of data](#) for the main IoP industries are available. Furthermore, [data at 4 decimal places for IoP and the main sub-sectors is now available \(56 Kb Excel sheet\)](#)
- users would like more information on data content. From the bulletin published on 11 March 2015, response rates for the Monthly Business Survey data feeding in to IoP were included
- users also raised concerns that the IoP is not benchmarked to annual data through the supply and use framework. This is being addressed as part of our [response \(875 Kb Pdf\)](#) to the [National Statistics Quality Review of National Accounts \(570.9 Kb Pdf\)](#)

As a reader and user of our statistics we would welcome your feedback on the content of this publication, your views for improvement and on the way you currently use our statistics. If you would like to get in touch or to send your feedback please contact us via email: [indexofproduction@ons.gsi.gov.uk](mailto:indexofproduction@ons.gsi.gov.uk).

## 10. Following ONS

Follow @ONS on [Twitter](#) and receive up to date information about our statistical releases.

Like our [Facebook](#) page to receive our updates in your newsfeed and to post comments on our page.

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12. 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.gov.uk](mailto:media.relations@ons.gov.uk)

These National Statistics are produced to high professional standards and released according to the arrangements approved by the UK Statistics Authority.