

Statistical bulletin

Index of Production, UK: August 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

- The data in this release are consistent with the Quarterly National Accounts published on 30 September 2015 and data used for Blue Book 2015 due for release on 30 October 2015
- Total production output is estimated to have increased by 1.9% in August 2015 compared with August 2014. There were increases in 2 of its 4 main sectors, with the largest contribution coming from mining & quarrying, which increased by 17.7%
- Manufacturing output decreased by 0.8% in August 2015 compared with August 2014. The largest contribution to the decrease came from the manufacture of machinery & equipment not elsewhere classified, which decreased by 13.0%
- Total production output is estimated to have increased by 1.0% in August 2015 compared with July 2015. There were increases in 3 of its 4 main sectors, with the largest contribution coming from mining & quarrying, which increased by 6.0%
- Manufacturing output increased by 0.5% in August 2015 compared with July 2015. The main manufacturing components contributing to the growth were the manufacture of transport equipment; the manufacture of basic metals & metal products; and the manufacture of food, beverages & tobacco
- In the 3 months to August 2015, production and manufacturing were 9.4% and 6.5% respectively below their figures reached in the pre-downturn GDP peak in Quarter 1 (Jan to Mar) 2008
- The earliest period open for revision in this release was January 1997. Revisions to Index of Production data up to and including Quarter 2 (Apr to June) 2015 are consistent with the Quarterly National Accounts publication released on 30 September 2015

2 . Index of Production headline figures

This bulletin presents the monthly estimates of the Index of Production (IoP) for the UK production industries, August 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 14.9% of the [output approach to the measurement of gross domestic product](#).

IoP values are referenced to 2012 so that the average for 2012 is equal to 100. Therefore, currently an index value of 110 would indicate that output is 10% higher than the average for 2012. 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.

This release presents:

- the most recent IoP figures
- the economic context to the IoP
- GDP impact and components
- a supplementary analysis to the IoP
- spotlight
- background notes section including an assessment of the quality of the IoP, as well as an explanation of the terms used in this bulletin

Table 1 shows the main figures for this release. Figure 1 shows the production and manufacturing series from May 2013 to August 2015.

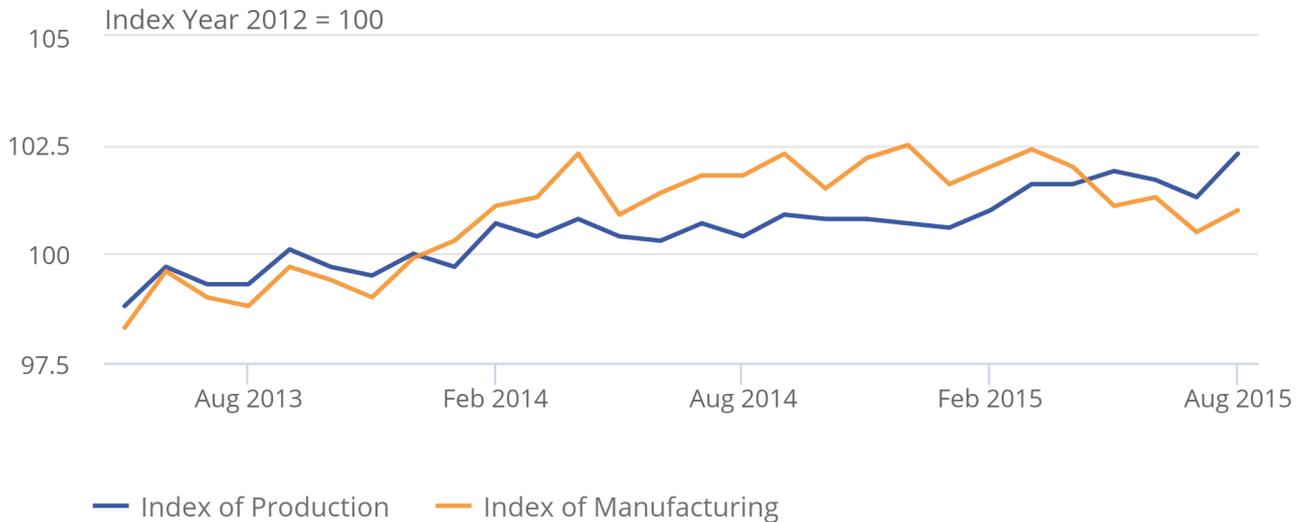
Table 1: Index of Production main figures, August 2015, UK

	Index number	Most recent month on a year earlier	Most recent 3 months on a year earlier	Most recent month on previous month	Percentage Change	
					Most recent 3 months on previous 3 months	
	2012=100					
Production	102.3	1.9	1.3	1.0		0.1
Manufacturing	101.0	-0.8	-0.7	0.5		-0.9

Source: Office for National Statistics

Figure 1: Seasonally adjusted production and manufacturing, May 2013 to August 2015, UK

Figure 1: Seasonally adjusted production and manufacturing, May 2013 to August 2015, UK



Source: 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](#); these are based on 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, as with 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. Since January 2015, we have published the MBS response rates for data included in the IoP in the background methods section of the statistical bulletin. This provides further information of the percentages of turnover and returned questionnaires. 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 \(4.6 Mb ZIP\)](#) section in the background notes.

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.

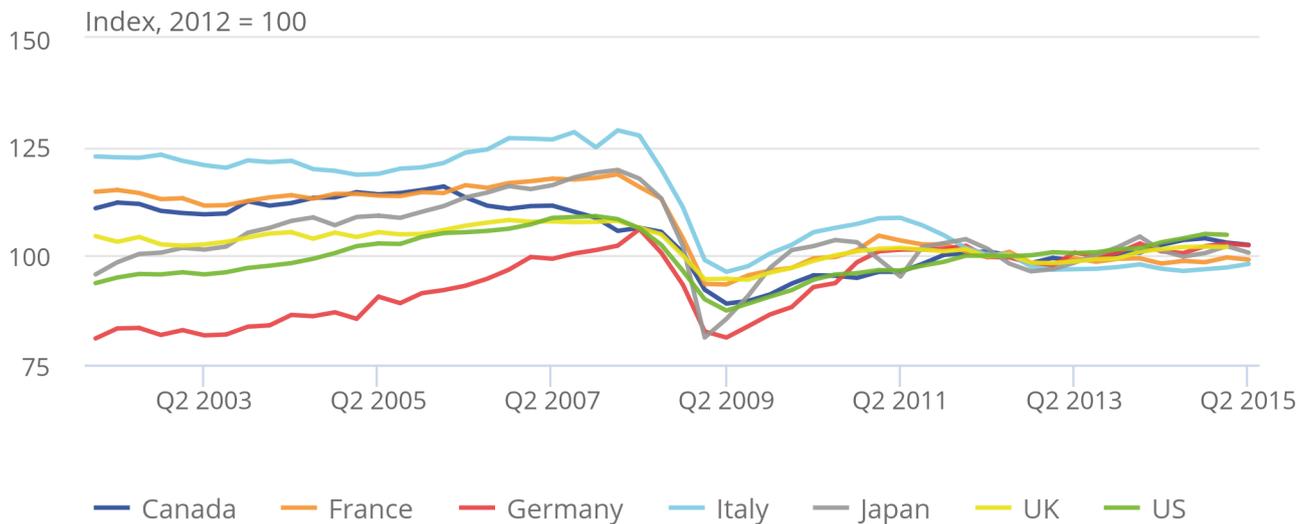
4 . Economic context

Between January and May 2015, production output increased at a moderate pace. This upward trend was reversed in June and July 2015, although the contraction in output over these 2 months was smaller than the increases observed since the beginning of the year. The latest data show that production output increased strongly between July and August 2015 and was above the level seen in May 2015. In 2015, the performance of the manufacturing industry has been more volatile than that of the Index of Production (IoP) as a whole. Alternating periods of expansion and contraction, have meant that despite a moderate increase from July to August 2015, manufacturing levels remained lower than at the start of the year (for more information and analysis of the latest figures see the production and sectors supplementary analysis section of the bulletin).

Figure 2 shows that the UK manufacturing industry grew steadily between Quarter 1 (Jan to Mar) 2002 and Quarter 1 (Jan to Mar) 2008 at a compound growth rate of 0.1% per quarter. The economic downturn impacted the industry severely, with output contracting by 12.3% between the economy's peak in Quarter 1 (Jan to Mar) 2008 and the economy's trough in Quarter 2 (Apr to June) 2009. Following the economic downturn in 2008 and 2009, manufacturing returned to growth for a short period, before falling again in 2011 and 2012.

Figure 2: Quarterly international manufacturing output, Quarter 1 (Jan to Mar) 2002 to Quarter 2 (Apr to June) 2015

Figure 2: Quarterly international manufacturing output, Quarter 1 (Jan to Mar) 2002 to Quarter 2 (Apr to June) 2015



Source: Monthly Business Survey (Production and Services) - Organisation for Economic Co-operation and Development, Office for National Statistics

Notes:

1. Data for the UK are consistent with the August ONS Index of Production bulletin, while data for all other remaining G7 economies have been sourced from OECD
2. Throughout this release 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)

Between Quarter 2 (Apr to June) 2014 and Quarter 2 (Apr to June) 2015, the index of production experienced relatively steady growth. The manufacturing industries also experienced quarter-on-quarter growth in 2014, however, it then contracted in the first 2 quarters of 2015 (for more information and analysis on the latest quarterly data see the production and sectors supplementary analysis section of the bulletin).

Headline GDP surpassed its pre-downturn peak in Quarter 2 (Apr to June) 2013, but services (which account for over 78% of total GDP) remained the only headline industry grouping to have achieved this. Output in the production and manufacturing industries still remained below levels experienced just before the onset of the downturn (according to the [Quarterly National Accounts - Quarter 2 \(Apr to June\) 2015](#)). This is consistent with the historical trend of services growing at a faster rate than production and manufacturing, despite the fact that productivity in the production industries, manufacturing in particular, has on average grown at a faster rate than in the service industries since 1997 (more information can be found in [Labour Productivity, Quarter 2 \(Apr to June\) 2015](#)). The slower output growth and increased productivity, therefore, reflect the falling share of the labour force employed in manufacturing, which fell from 16.5% to 9.8% between 1997 and 2014 ([Labour Market Statistics, September 2015](#), reference table EMP13).

Over the past year the manufacturing industry has experienced low price inflation, 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). Input prices paid by UK manufacturers fell by 13.8% in the year to August 2015, compared with a fall of 12.6% in the year to July 2015. Output prices have also experienced deflation, falling by 1.8% in the year to August 2015, with crude oil impacting input prices. This feeds through to petroleum products, contributing to the decrease in their output prices (more information can be found in [Producer Price Inflation, August 2015](#)).

International perspective

Globally, the performance of manufacturing output has varied across the G7 nations since the onset of the economic downturn (Figure 2). Japan experienced the largest average annual fall in output during 2008 and 2009 (12.5% per annum), whereas the smallest decline was in the UK (6.1% per annum).

Following the economic downturn in 2008 and 2009, all G7 nations' manufacturing industries returned to growth. However, almost all members experienced subsequent declines in growth between the second half of 2012 and the first half of 2013, particularly in Italy and Japan. More recently, in Quarter 2 (Apr to June) 2015, Italy and the United States experienced growth in manufacturing output while output contracted in the other G7 countries to varying degrees. The largest contractions took place in Japan at 1.5%, while France, Canada and Germany respectively contracted by 0.5%, 0.5% and 0.4%. The manufacturing output of the UK also contracted.

For most G7 countries, manufacturing output remained below their respective pre-downturn levels experienced in 2007. Output in Italy, France, Japan and Canada remained 22.6%, 15.6%, 14.1% and 7.1% below the countries' pre-downturn levels respectively. In Quarter 2 (Apr to June) 2015, the UK and the USA were also below their respective pre-downturn levels but to a lesser extent. However, Germany was above its pre-downturn level, by 2.2% (more information can be found on the [OECD website](#)).

Figure 3 presents month on corresponding month of previous year percentage growth rates in 8 of the 13 UK manufacturing sub-industries for July 2015, alongside comparable growth rates achieved in Germany, France, Italy and the euro area. This shows that the UK manufacturing output contracted by 1.2%, compared with total euro area manufacturing growth of 1.6%. Manufacturing output decreased in Germany and France by 0.4% and 1.7% respectively, while the manufacturing output in Italy increased by 1.9%.

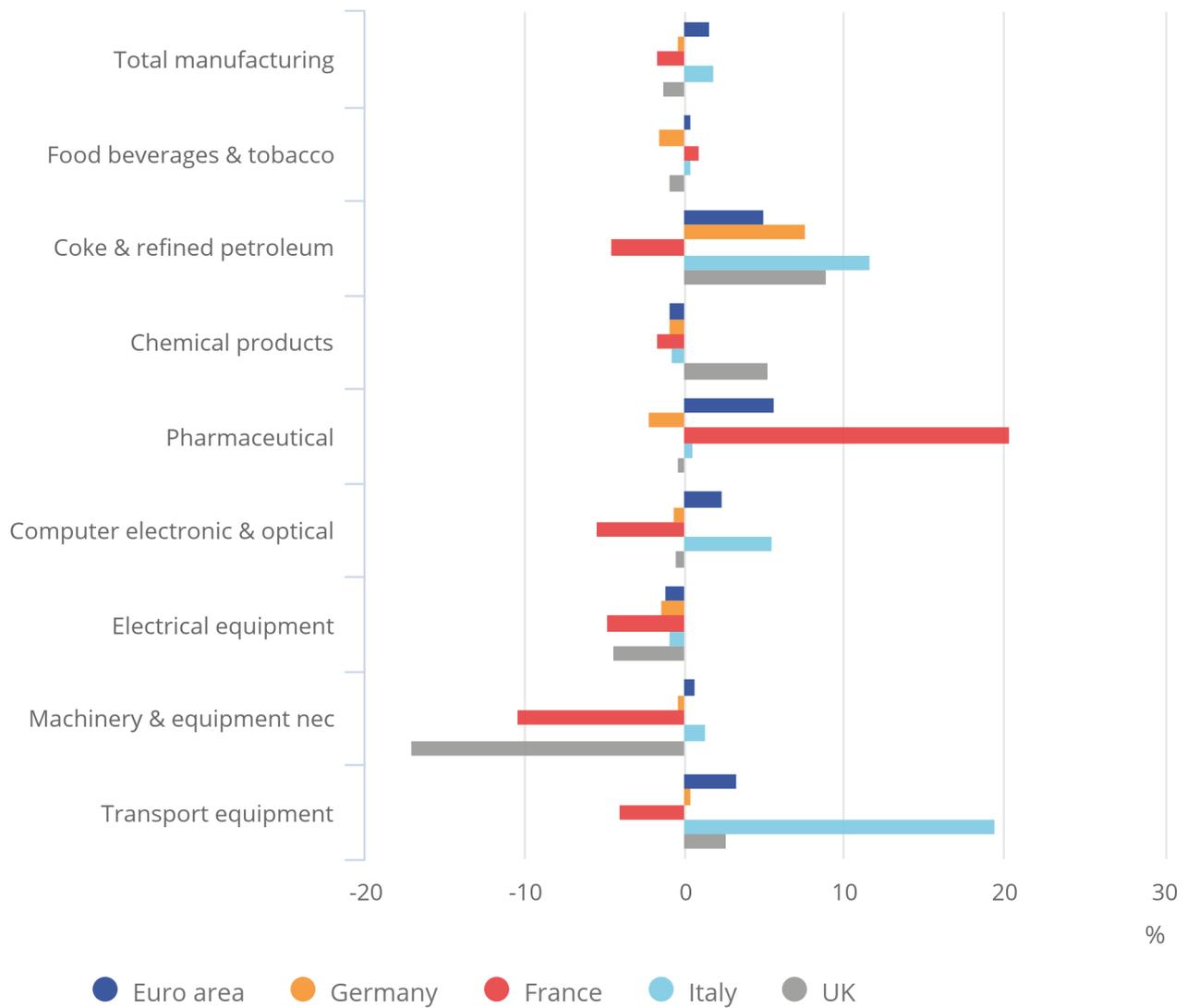
Figure 3 also shows that the UK's comparable strength was concentrated in the manufacture of "chemical products", which was offset by relative weakness in the manufacture of "machinery & equipment not else classified".

Figure 3: Month on same month a year ago manufacturing sub-industry percentage growth in the UK and the euro area

July 2015 compared with July 2014

Figure 3: Month on same month a year ago manufacturing sub-industry percentage growth in the UK and the euro area

July 2015 compared with July 2014



Source: Eurostat, Office for National Statistics

Notes:

1. Data for the UK are consistent with the July 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, periods back to January 1997 are open for revision, in line with the [National Accounts revisions policy \(41.6 Kb Pdf\)](#) and are consistent with the Quarterly National Accounts publication released on 30 September 2015.

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 available for Quarter 2 (Apr to June) 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 August 2015 will be published on 9 October 2015 and services output for the same period on 27 October 2015.

Table 2: Components of GDP table, August 2015, UK

Publication	Percentage of GDP ⁴	Release date	Month or quarter of GDP	Most recent 3 months on a year earlier	Most recent 3 months on 3 months earlier ³	Percentage change	
						Most recent month on the same month a year ago ³	Most recent month on the previous month
Index of	14.9	07 Oct	Aug	1.3	0.1	1.9	1.0
Production ¹			Jul	1.2	0.2	0.7	-0.3
Construction	5.9	11 Sep	Jul	1.3	-0.3	-0.7	-1.0
			Jun	2.4	0.2	2.6	0.9
Index of services	78.6	30 Sep	Jul	2.7	0.8	2.8	0.2
			Jun	2.7	0.6	3.0	0.6
Retail Sales		17 Sep	Aug	4.0	0.4	3.7	0.2
			Jul	4.3	0.5	4.1	0.0
Agriculture	0.7		Q2 2015 ₂	1.1	0.4

Source: Office for National Statistics

Notes:

1. The data for the index of production reflects the latest revisions published as part of this release
2. Throughout this release 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)
3. Any apparent inconsistencies between this table and the latest GDP estimate are due to rounding
4. 'Percentage of GDP' column may not add up to 100 due to rounding

6 . Production and sectors supplementary analysis

Table 3: Headline growth rates to the Index of Production, August 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	1.9	1.9	1.0	1.0
Sector B	13.5	17.7	2.22	6.0	0.82
Division 06	10.6	25.6	2.34	8.7	0.91
Sector C	69.1	-0.8	-0.55	0.5	0.34
Sector D	9.3	-3.1	-0.28	0.3	0.03
Sector E	8.1	6.0	0.50	-2.5	-0.22

Source: Office for National Statistics

Notes:

1. Headline figures for the Index of Production are:

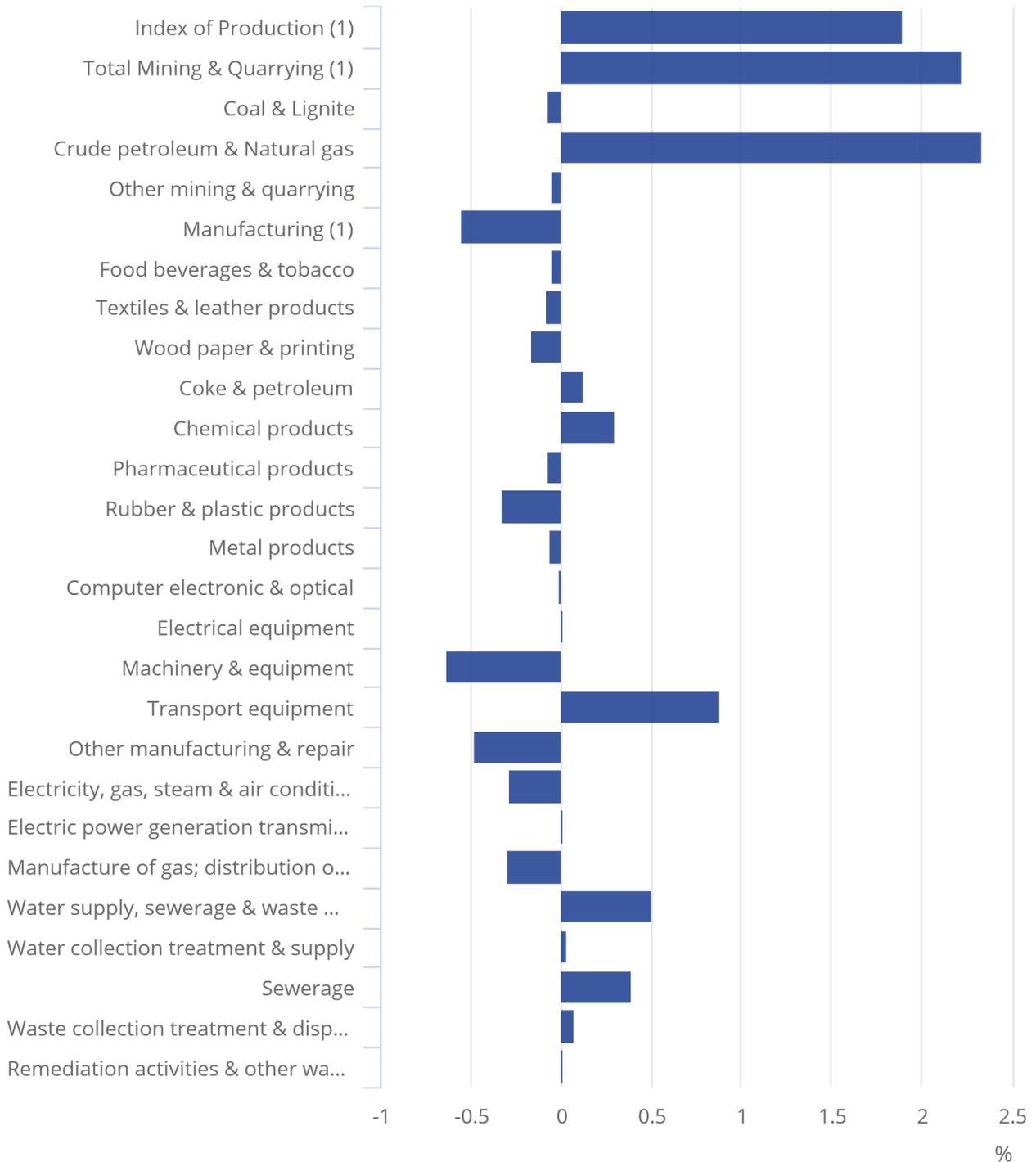
Total Index of Production; Sector B Mining & quarrying; and within this Division 06 Oil & gas extraction; Sector C Manufacturing; Sector D Electricity, gas, steam & air conditioning; and Sector E Water supply, sewerage & waste management

Figure 4: Contribution to production percentage growth, between August 2014 and August 2015, UK

Growth rates can be found in the attached IoP 5 tables

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Notes:

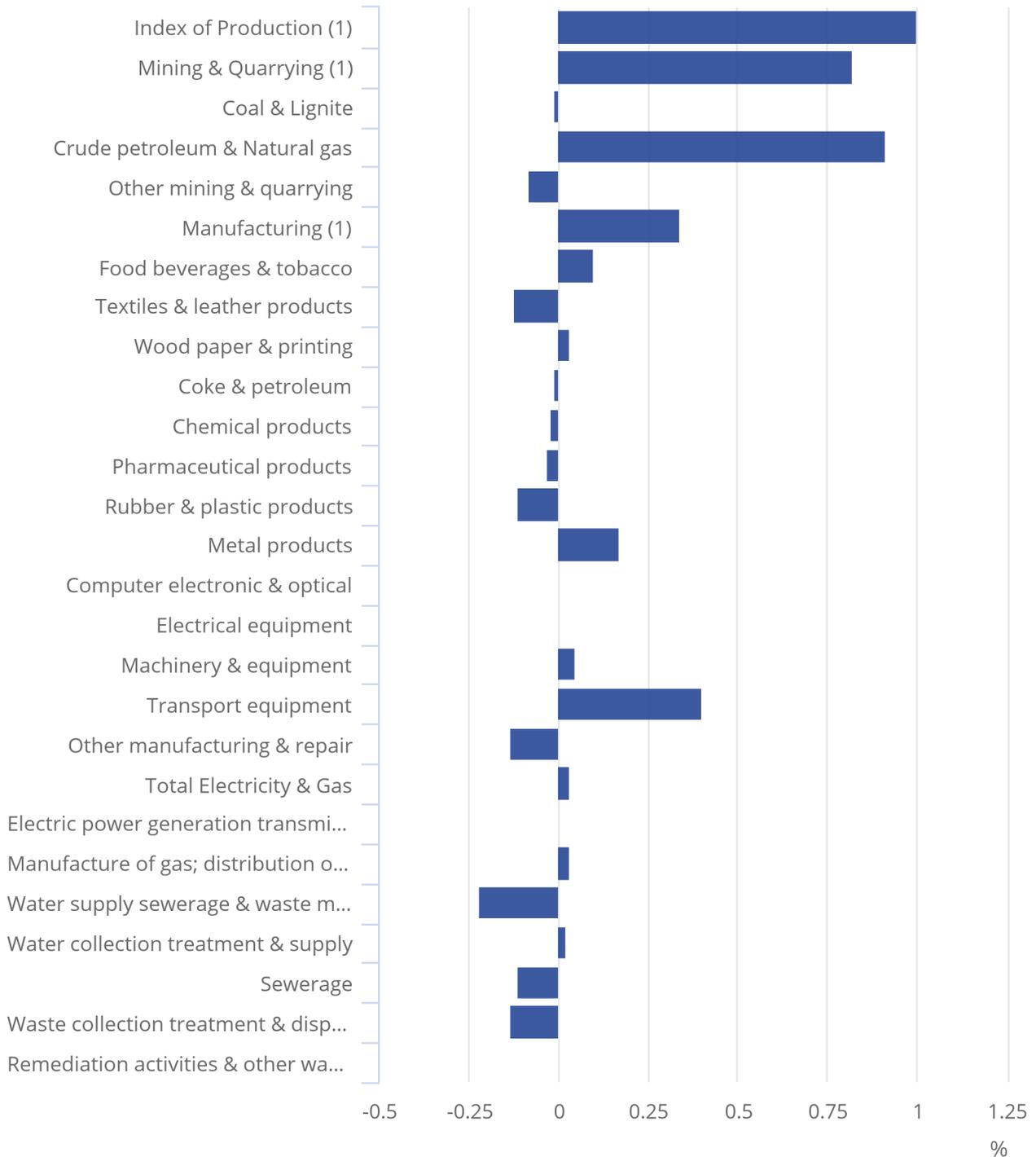
1. Headline sectors

Figure 5: Contribution to production percentage growth, between July 2015 and August 2015, UK

Growth rates can be found in the attached IoP 5 tables

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Notes:

1. Headline sectors

Total production

Total production output in August 2015 increased by 1.9% compared with August 2014 (Table 3). This increase reflected rises in 2 of its 4 main sectors, with mining & quarrying having the largest contribution, increasing by 17.7% and contributing 2.2 percentage points to total production. This was the largest increase since May 1994 when it rose by 23.7%. The increase in mining & quarrying was followed by an increase in water supply, sewerage & waste management output, which increased by 6.0% and contributed 0.5 percentage points to total production. These increases were partially offset by a decrease in manufacturing (the largest component in production), which decreased by 0.8% and contributed 0.5 percentage points and in electricity, gas, steam & air-conditioning output, which decreased by 3.1% and contributed 0.3 percentage points to total production (Figure 4).

Between July 2015 and August 2015, total production increased by 1.0% (Table 3). There were increases in 3 of its 4 main sectors. The largest contribution came from mining & quarrying, which increased by 6.0% and contributed 0.8 percentage points to total production. The increase in mining & quarrying was followed by increases in manufacturing, which increased by 0.5% and contributed 0.3 percentage points to total production and in electricity, gas, steam & air-conditioning output, which increased by 0.3% and had a negligible contribution to total production. Partially offsetting the increases was a decrease in water supply, sewerage & waste management output, which decreased by 2.5% and contributed 0.2 percentage points to total production (Figure 5).

Manufacturing

Manufacturing output decreased by 0.8% between August 2014 and August 2015 and contributed 0.5 percentage points to total production. Output decreased in 9 of the 13 manufacturing sub-sectors compared with a year ago (Figure 4). The manufacturing sub-sector with the largest downward contribution to total production growth was the manufacture of machinery & equipment not elsewhere classified, which decreased by 13.0%. This was the ninth consecutive decrease since November 2014 and anecdotal evidence suggested that there is a general decrease across the industry compared with a year ago.

In contrast, the manufacturing sub-sector with the largest upward contribution to total production compared with a year ago was the manufacture of transport equipment. This sub-sector increased by 10.5% and contributed 0.9 percentage points to total production. The main contributor within this sub-sector was the manufacture of motor vehicles, trailers & semi trailers, which increased by 13.6% and contributed 0.6 percentage points to total production.

Manufacturing output increased by 0.5% between July 2015 and August 2015, having decreased in July 2015 by 0.7%. There were increases in 6 of the 13 manufacturing sub-sectors (Figure 5). The manufacturing sub-sector with the largest upward contribution to total production was the manufacture of transport equipment, which increased by 4.6% and contributed 0.4 percentage points to total production. The main contributor within this sub-sector was the manufacture of motor vehicles, trailers & semi trailers, which increased by 8.8% and contributed 0.4 percentage points to total production, the largest rise since January 2014, when it rose by 9.6%. Anecdotal evidence suggested that a contributor to the increase was the effect of some earlier than usual shutdowns in the previous month.

In contrast to the above increases, the manufacturing sub-sector with the largest downward contribution to total production was other manufacturing & repair, which decreased by 2.0% and contributed 0.1 percentage points to total production. The main contributor within this sub-sector was the manufacture of furniture, which decreased by 5.3% and contributed 0.1 percentage points to total production.

Mining and quarrying

Mining & quarrying output increased by 17.7% between August 2014 and August 2015, the fifth consecutive increase since March 2015, contributing 2.2 percentage points to total production. The sub-sector with the largest upward contribution was the extraction of crude petroleum & natural gas, which increased by 25.6% and contributed 2.3 percentage points to total production (Figure 4). This was due to increases over recent months in crude oil production compared with last year, when major planned maintenance shutdowns in a number of terminals hampered production.

Mining & quarrying output increased by 6.0% in August 2015 compared with July 2015 and contributed 0.8 percentage points to total production. This followed a smaller increase of 0.7% in the previous month. 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 5).

Electricity, gas, steam & air conditioning

Electricity, gas, steam & air conditioning output decreased by 3.1% in August 2015 compared with August 2014, the third consecutive decrease and contributed 0.3 percentage points to total production (Figure 4). This reflected a decrease in 1 of its 2 sub-sectors, the manufacture of gas & distribution of gaseous fuels through mains, which decreased by 11.2% and had a downward contribution of 0.3 percentage points to total production.

Electricity, gas, steam & air conditioning output increased by 0.3% in August 2015 compared with July 2015 and had a negligible contribution to total production (Figure 5). The increase was in 1 of its 2 sub-sectors, the manufacture of gas & distribution of gaseous fuels through mains, which increased by 1.3% and had a negligible contribution to total production. This rise followed a decrease in July 2015 as a result of revised data from source (see Revisions to IoP for further details).

Water & waste management

Water supply, sewerage & waste management output increased by 6.0% in August 2015 compared with August 2014, the sixth consecutive increase and contributed 0.5 percentage points to total production. This increase reflected a rise in all of its 4 sub-sectors' output (Figure 4), with the largest contribution coming from sewerage, which increased by 18.5% and contributed 0.4 percentage points to total production.

Water supply, sewerage & waste management output decreased by 2.5% between July 2015 and August 2015, having increased by 1.1% the previous month. This decrease reflected a fall in 3 of its 4 sub-sectors (Figure 5). The largest downward contribution came from waste collection, treatment & disposal activities, which decreased by 3.1% and contributed 0.1 percentage points to total production, having increased by 2.6% in the previous month. Anecdotal evidence suggested the industry displayed a widespread weakness, with exports highlighted as a contributing factor.

Revisions to IoP

Revisions to the Index of Production follow the [National Accounts Revisions policy \(41.6 Kb Pdf\)](#). 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 one indication of the reliability of this important 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 6.

In this release of data, the earliest period open for revision is January 1997, as this dataset contains the annual updates that are also included in the Quarterly National Accounts consistent with the Blue Book 2015 publication.

There are numerous sources of revision that have affected production in this bulletin, including but not limited to:

- the annual update of the weights used to construct the chained volume measures of output; these are now based on the new 2012 industry weights
- the annual update of seasonal adjustment models
- the published indices being re-referenced from 2011=100 to 2012=100
- methodological improvement
- updated source data

As is common for the first Index of Production publication following the annual updates, there are more and larger revisions than in an ordinary publication (see Table IOP5R which shows the revisions to IoP estimates against the previously published).

Further details of notable revisions to IoP data up to and including Quarter 2 (Apr to June) 2015 and the associated impact on previously published GDP estimates can be found in the [Quarterly National Accounts](#) and in the [GDP output improvement report \(946.2 Kb Pdf\)](#) released on 30 September 2015.

Evidence from the Department of Energy and Climate Change (DECC) suggested revisions to July in the electricity, gas, steam & air conditioning supply sector resulted from the receipt of actual data to replace estimates.

7 . Spotlight: The impact of the Blue Book 2015 changes on the Index of Production and its components

The release of Blue Book 2015 constitutes our annual update of the National Accounts. These (methodological and data) changes are designed to ensure that official statistics reflect the changing nature of the UK and global economies, to enable fair and meaningful international comparisons and to permit analysis of current economic trends on the best available data. While the scope and impact of these changes is smaller than in previous years – and notably less than in Blue Book 2014 – there are a range of important measurement developments (more information about the Blue Book changes can be found in [Impact of methods changes to the National Accounts and Sector & Financial Accounts, Q1 1997 to Q2 2015](#)).

The Blue Book 2015 revisions, which go back to January 1997, have affected the Index of Production (IoP) and its components to different extents. The main sources of the revision are the annual update of weights and seasonal adjustment models, re-referencing of the published indices from 2011 to 2012, methodological improvements and updated source data.

As is common for the first IoP publication following the annual updates, there are larger revisions than in an ordinary publication. Some of these revisions are analysed in this section of the bulletin.

The annual update of weights in Blue Book 2015 has increased the production weight within total gross value added (GVA), from 146.3 parts per thousand (ppt) to 148.9ppt. The annual change in weights has also impacted all of the components of loP to a different extent. Table 4 shows that manufacturing is still the dominant industry within production, even with its weight decreasing from 693.6ppt in 2011 to 690.8ppt in 2012, where the loP weight is 1000. However, mining & quarrying saw the largest decrease in weight, from 156.8ppt in 2011 to 134.6 ppt in 2012, mainly driven by a decrease in the weight of extraction of crude petroleum & natural gas from 128.7 ppt in 2011 to 106.5ppt in 2012. Both electricity, gas, steam & air conditioning supply and water & waste management have seen an increase in their weights by 22.5ppt and 2.5ppt, respectively. The rise in the weight of electricity, gas, steam & air conditioning supply was mainly driven by an increase in the weight of electric power generation, transmission & distribution which increased significantly from 47.4ppt in 2011 to 68.4ppt in 2012.

Table 4: Changes in the weights of the main components of loP between 2011 and 2012, UK

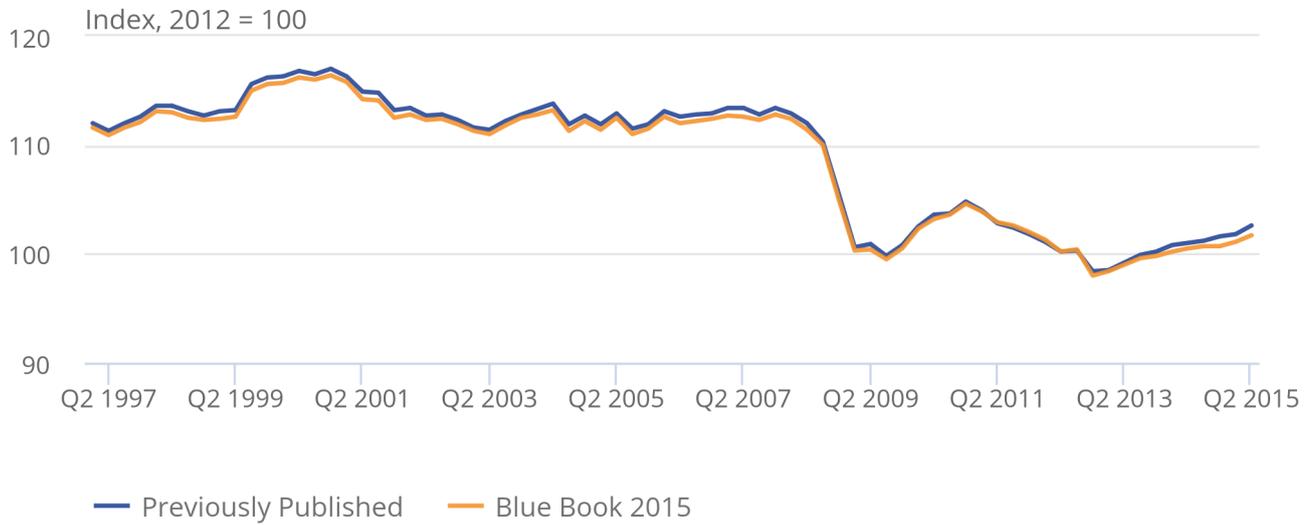
loP component	Previously published weights	Blue Book 2015 consistent weights
Mining & quarrying	156.8	134.6
Manufacturing	693.6	690.8
Electricity, gas, steam & air conditioning supply	71.0	93.5
Water & waste management	78.6	81.1

Source: Office for National Statistics

The Blue Book revisions to the loP have impacted not only the weights of the loP and its main components but their paths as well. Figure 6 shows the volume of production indexed to 100 at 2012. Prior to the downturn, the Blue Book 2015 consistent estimates of the loP grew at broadly the same rate as the previously published data. During the economic downturn (Quarter 1 (Jan to Mar) 2008 to Quarter 2 (Apr to June) 2009) the index experienced a slightly deeper fall of 10.7% when compared with the previously published estimate of 10.6%. Since Quarter 1 (Jan to Mar) 2013, the loP grew at a slower rate than previously published and in Quarter 2 (Apr to June) 2015 it was 9.5% below its level observed during the economy's peak in Quarter 1 (Jan to Mar) 2008 - this compares with a previously published estimate which showed that output was 9.2% below peak levels.

Figure 6: Index of Production, Quarter 1 (Jan to Mar) 1997 to Quarter 2 (Apr to June) 2015, UK

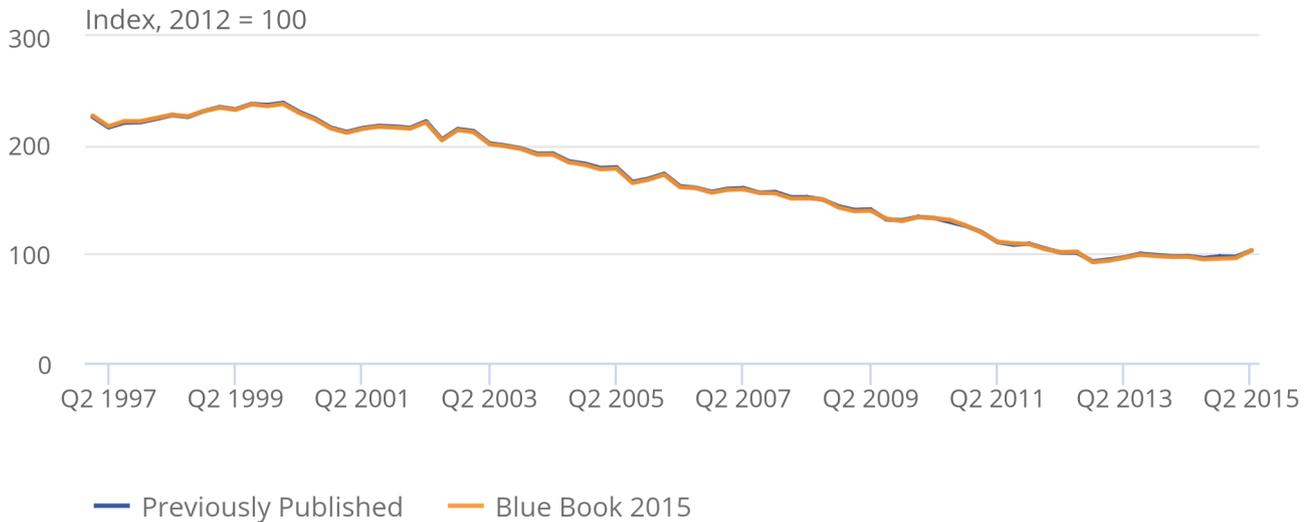
Figure 6: Index of Production, Quarter 1 (Jan to Mar) 1997 to Quarter 2 (Apr to June) 2015, UK



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

Figure 7: Mining & quarrying, Quarter 1 (Jan to Mar) 1997 to Quarter 2 (Apr to June) 2015, UK

Figure 7: Mining & quarrying, Quarter 1 (Jan to Mar) 1997 to Quarter 2 (Apr to June) 2015, UK



Source: Energy and Climate Change

Figure 8 shows that the path of manufacturing has been broadly unchanged between Quarter 1 (Jan to Mar) 1997 and Quarter 2 (Apr to June) 2012. Since Quarter 3 (July to Sep) 2012, the industry has been growing at a slower rate than previously estimated (an average compound growth rate of 0.1% per quarter compared with the previously estimated 0.2% per quarter). In Quarter 2 (Apr to June) 2015, manufacturing was still 6.0% below its peak experienced in Quarter 1 (Jan to Mar) 2008, compared with 4.8% in the previously published data.

Figure 8: Manufacturing, Quarter 1 (Jan to Mar) 1997 to Quarter 2 (Apr to June) 2015, UK

Figure 8: Manufacturing, Quarter 1 (Jan to Mar) 1997 to Quarter 2 (Apr to June) 2015, UK

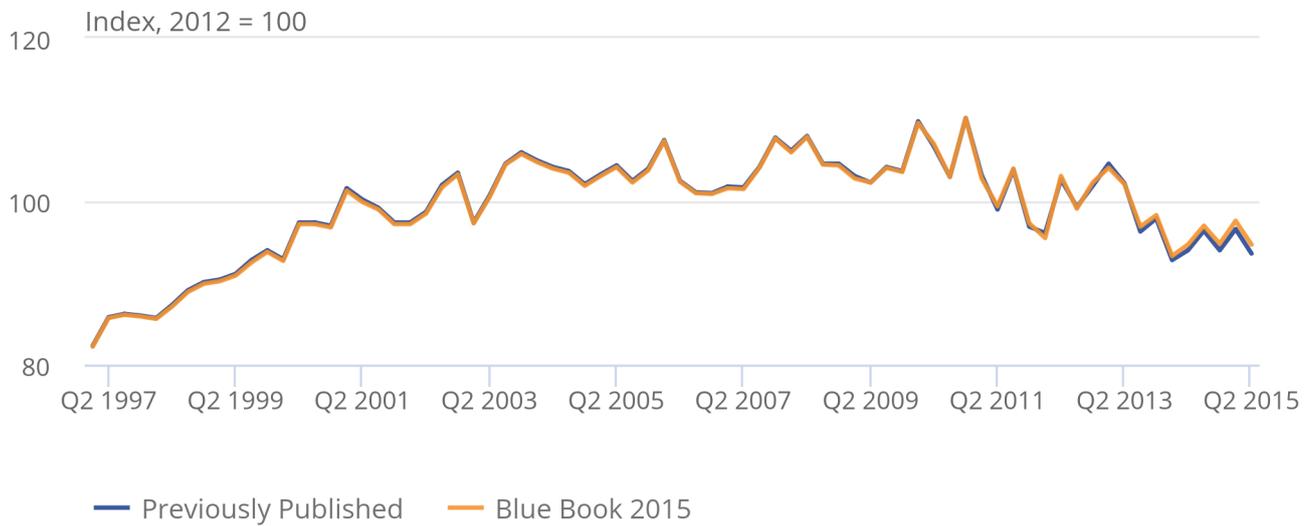


Source: Monthly Business Survey (Production and Services) - Office for National Statistics

Figure 9 shows that the profile of the electricity, gas, steam & air conditioning supply industry is broadly unchanged following the Blue Book revisions. As can be seen from the figure the growth of this industry is slightly more volatile than the other production components, reflecting relative volatility in the industry's supply and demand.

Figure 9: Electricity, gas, steam & air conditioning supply, Quarter 1 (Jan to Mar) 1997 to Quarter 2 (Apr to June) 2015, UK

Figure 9: Electricity, gas, steam & air conditioning supply, Quarter 1 (Jan to Mar) 1997 to Quarter 2 (Apr to June) 2015, UK

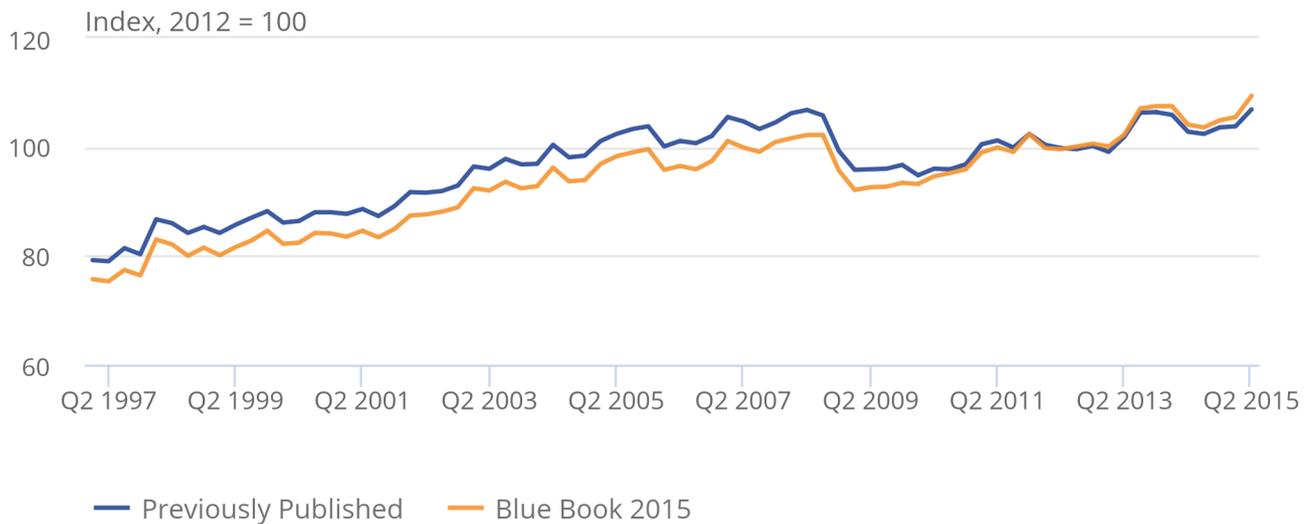


Source: Energy and Climate Change

Water & waste management has experienced relatively large revisions since 1997 due to a source data update in industry 38 (waste collection, treatment & disposal activities; materials recovery). The economic downturn (Quarter 1 (Jan to Mar) 2008 to Quarter 2 (Apr to June) 2009) affected the industry less severely than previously estimated with its output contracting by 8.9% when compared with 9.7% from the previously published estimates. Since the economic downturn the industry has followed a generally upward trend and in Quarter 2 (Apr to June) 2015 it was 7.7% above its level in Quarter 1 (Jan to Mar) 2008, which was revised up from 0.7% in the previously published data. However, pre-downturn rates of growth remain broadly unchanged.

Figure 10: Water and waste Management, Quarter 1 (Jan to Mar) 1997 to Quarter 2 (Apr to June) 2015, UK

Figure 10: Water and waste Management, Quarter 1 (Jan to Mar) 1997 to Quarter 2 (Apr to June) 2015, UK



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

Next month's spotlight will look at the impact of the Blue Book changes on the manufacturing sub-industries

8. Background notes

1. What's new?

The [GDP Output Improvement Report](#) published on 30 September 2015, provides a detailed update of the implementation of improvements for Blue Book 2015, progress on industry reviews and wider cross-cutting improvements, a comprehensive timetable for the industry review project and progress on experimental statistics.

On 1 September 2015, we published an article on [the performance of the UK's motor vehicle manufacturing industry](#).

This article submitted by the Department of Energy & Climate Change (DECC) highlights the oil and gas industry annual investment allowance. Source: Offshore Energy Today.com.

We published [Impact of Blue Book 2015 Changes on Chained Volume Measure Gross Domestic Product Estimates](#), this article details estimates of the total impact of all the improvements to chained volume measure (CVM or "real") gross domestic product (GDP) implemented in September 2015.

Upcoming changes

In next month's publication, the tobacco products index will be merged with alcoholic beverages under a single index, to be labelled "Alcoholic beverages & Tobacco products", in the Food, Drink and Tobacco sub-

sector. This change is to ensure the confidentiality of statistical outputs as defined in Section 9 of The Statistics of Trade Act (1947), Section 39 of the Statistics and Registration Service Act (2007) and Principle 5 of the Code of Practice for Official Statistics.

The Index of Production release for September 2015, to be published on Friday 6 November 2015, will have a revisions period back to July 2015.

VAT Project update

An article, [Feasibility study into the use of HMRC turnover data within Short-term Output Indicators and National Accounts](#), was published on 14 August 2015. The project is exploring ways in which HM Revenue & Customs (HMRC) administrative data could be used to quality assure, supplement or replace the current turnover-based ONS surveys. This article is the first of a series of planned articles into this work.

2. Special events

We maintain a list of candidate special events in the [Special Events Calendar](#). As explained in our [Special Events policy](#), it is not possible to separate the effects of special events from other changes in the series.

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 UK. Index numbers of output in this statistical bulletin are on the base 2012=100 and are classified to the [2007 Standard Industrial Classification \(SIC\)](#). The production industries, which accounted for 14.9% of GDP in 2012, 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 an important 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](#) is available on our website.

Composition of the data

The Index of Production uses a variety of different data from sources that 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 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 5 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. We have included 2 response rates: 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 \(408.5 Kb Excel sheet\)](#) back to 2010.

Table 5: Monthly business survey (MBS) Response Rates, August 2015, UK

	Percentage			
	Year	Period	Turnover	Questionnaire
MBS overall	2015	Aug	84.9	75.0
		Jul	94.0	82.2
		Jun	95.7	84.6
		May	96.4	86.3
MBS production only	2015	Aug	89.7	78.4
		Jul	94.3	86.0
		Jun	97.2	88.2
		May	97.5	89.2

Source: Office for National Statistics

Seasonal adjustment

The index numbers in this statistical bulletin are all seasonally adjusted in line with international best practise using X-13-ARIMA-SEATS software. 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. 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.

6. 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 6 presents a summary of the differences between the first estimates published between September 2009 and August 2014 and the estimates published 12 months later.

Table 6: Revisions, August 2015, UK

				Percentage change
Revisions between first publication and estimates 12 months later				
Growth rates	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	0.1	-0.15	0.28	
Manufacturing - 3 month	-0.9	-0.1	0.27	
Production - 1 month	1	-0.12	0.26	
Manufacturing - 1 month	0.5	-0.07	0.23	

Source: Office for National Statistics

[Spreadsheets give revisions triangles \(4.6 Mb ZIP\)](#) 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 6 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.

7. 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 [Data section](#) 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](#).

8. 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.

9. Relevant links

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

On 7 January 2015, the following papers were published on our website:

[Impact of quarterly employment question on monthly survey response. \(110 Kb Pdf\)](#)

[Monthly Business Survey variance of change. \(163.7 Kb Pdf\)](#)

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

[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](#)

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).

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

10. 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 \(57 Kb Excel sheet\)](#)
- 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.

11. 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.

12. Next publication: Friday 6 November 2015

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13. 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