

Statistical bulletin

Index of Production, UK: July 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 0.8% in July 2015 compared with July 2014. There were increases in 2 of its 4 main sectors, with the largest contribution coming from mining & quarrying, which increased by 6.7%
- Manufacturing output decreased by 0.5% in July 2015 compared with July 2014. The largest contribution to the decrease came from the manufacture of machinery & equipment not elsewhere classified, which decreased by 15.9%
- Total production output is estimated to have decreased by 0.4% in July 2015 compared with June 2015. Manufacturing fell by 0.8% and was the only main sector to have decreased. This was the largest fall since May 2014
- The main manufacturing components contributing to the decrease between June 2015 and July 2015 were the manufacture of basic metals & metal products; the manufacture of transport equipment; and other manufacturing & repair
- In the 3 months to July 2015, production and manufacturing were 9.3% and 5.2% respectively below their figures reached in the pre-downturn GDP peak in Quarter 1 (Jan to Mar) 2008
- There is no impact on previously published estimates as no previous periods were open for revision. This is in line with the standard revisions policy for National Accounts

2 . Index of Production headline figures

This bulletin presents the monthly estimates of the Index of Production (IoP) for the UK production industries, July 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 April 2013 to July 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.

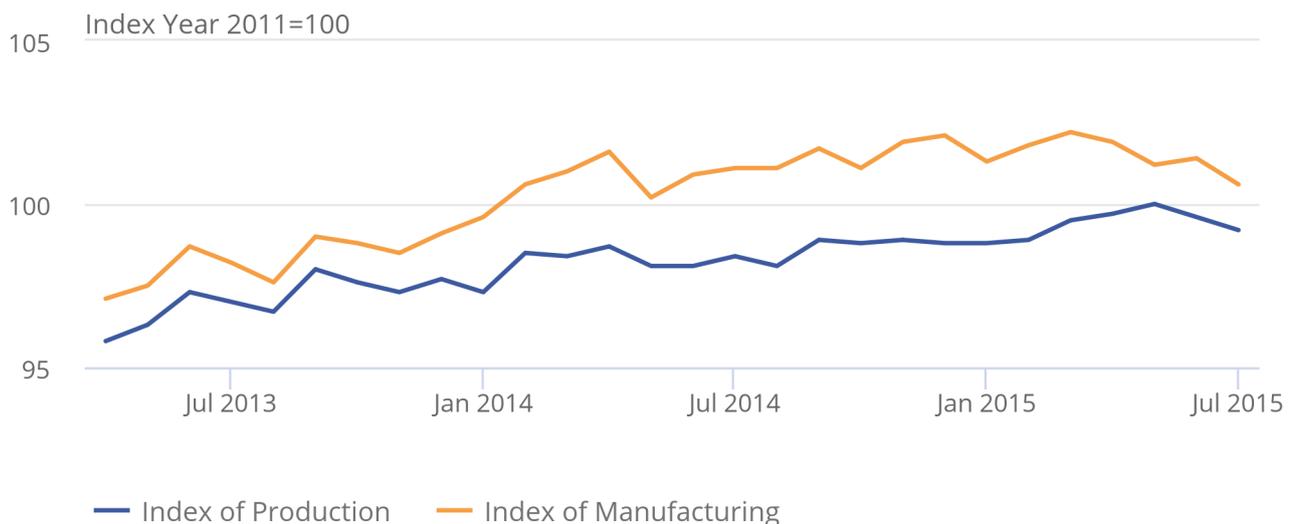
Table 1: Index of Production main figures, July 2015, UK

	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	99.2	0.8	1.4	-0.4	0.3
Manufacturing	100.6	-0.5	0.4	-0.8	-0.8

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

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

Figure 1: Seasonally adjusted production and manufacturing, April 2013 to July 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](#); 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. Since 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 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

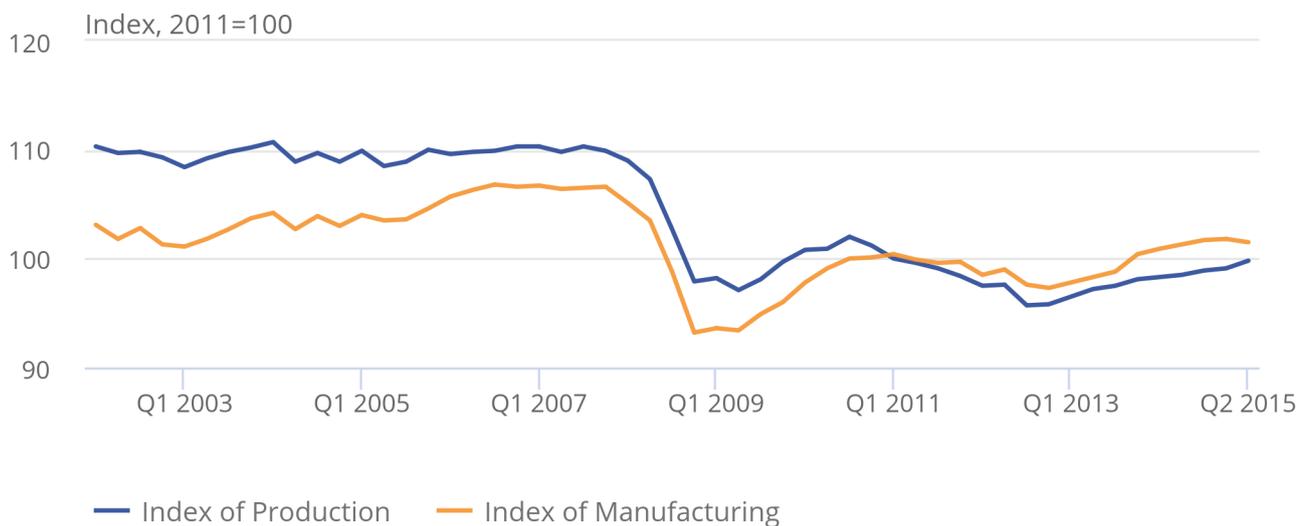
Between January and May 2015 production output increased at a moderate pace. However, this trend was reversed in June and July 2015, although the contraction in output over these 2 months was smaller than the increases observed since the beginning of the year. The performance of the manufacturing industry has been more volatile, with output increasing between January and March 2015 before contracting in April and May 2015. This was briefly reversed in June 2015, before manufacturing output contracted again in July 2015 (there is 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 12.4% between the economy's peak Quarter 1 (Jan to Mar) 2008 and the economy's trough in Quarter 3 (July to Sep) 2009. Following the economic downturn in 2008 and 2009, 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.

Between Quarter 1 (Jan to Mar) 2014 and Quarter 1 (Jan to Mar) 2015 the production and manufacturing industries experienced steady growth. In Quarter 2 (Apr to June) 2015 production continued to grow while manufacturing contracted (for more information and analysis on the latest quarterly data see the production and sectors supplementary analysis section of the bulletin).

Figure 2: Quarterly seasonally adjusted production and manufacturing, Quarter 1 (Jan to Mar) 2002 to Quarter 2 (Apr to June) 2015, UK

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

Headline GDP surpassed its pre-downturn peak in Quarter 3 (July to Sep) 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 [Second Estimate of GDP, 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 1 \(Jan to Mar\) 2015](#)). The slower output growth and increased productivity, therefore, reflect the falling share of the labour force employed in manufacturing, which has fallen from 16.5% to 9.8% between 1997 and 2014 ([Labour Market Statistics, August 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 12.4% in the year to July 2015, compared with a fall of 13.1% in the year to June 2015. Output prices have also experienced deflation, falling by 1.6% in the year to July 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 the [Producer Price Inflation bulletin, July 2015](#)).

5 . International perspective

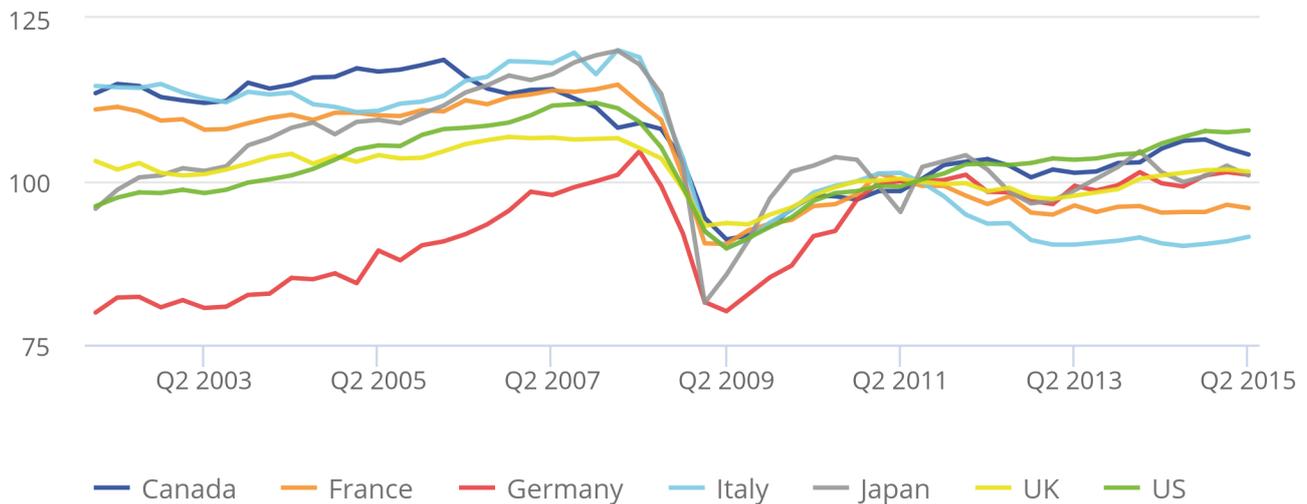
Globally, the performance of manufacturing output has varied across the G7 nations since the onset of the economic downturn (Figure 3). Japan experienced the largest average annual fall in output during 2008 and 2009 (12.5% per annum), whereas the smallest decline was in the UK (6.1% per annum).

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 a varying degrees. The largest contractions took place in Japan and Canada at 1.5% and 1.0% respectively, while France and Germany contracted by 0.5% each. The manufacturing output of the UK also contracted but to a lesser extent.

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 7.9% below the countries' pre-downturn levels respectively. In Quarter 2 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 2.1% (more information can be found on the OECD website).

Figure 3: Quarterly international manufacturing output, Quarter 1 (Jan to Mar) 2002 to Quarter 1 (Jan to Mar) 2015

Figure 3: Quarterly international manufacturing output, Quarter 1 (Jan to Mar) 2002 to Quarter 1 (Jan to Mar) 2015



Source: Office for National Statistics

Notes:

1. OECD/ONS 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 corresponding month of previous year percentage growth rates in 8 of the 13 UK manufacturing sub-industries for June 2015, alongside comparable growth rates achieved in Germany, France, Italy and the euro area. This shows that the UK experienced slower manufacturing growth at 0.5%, compared with total euro area manufacturing growth of 1.4%. Manufacturing output increased in Germany and France by 0.8% and 0.4% respectively, while the manufacturing output in Italy stagnated.

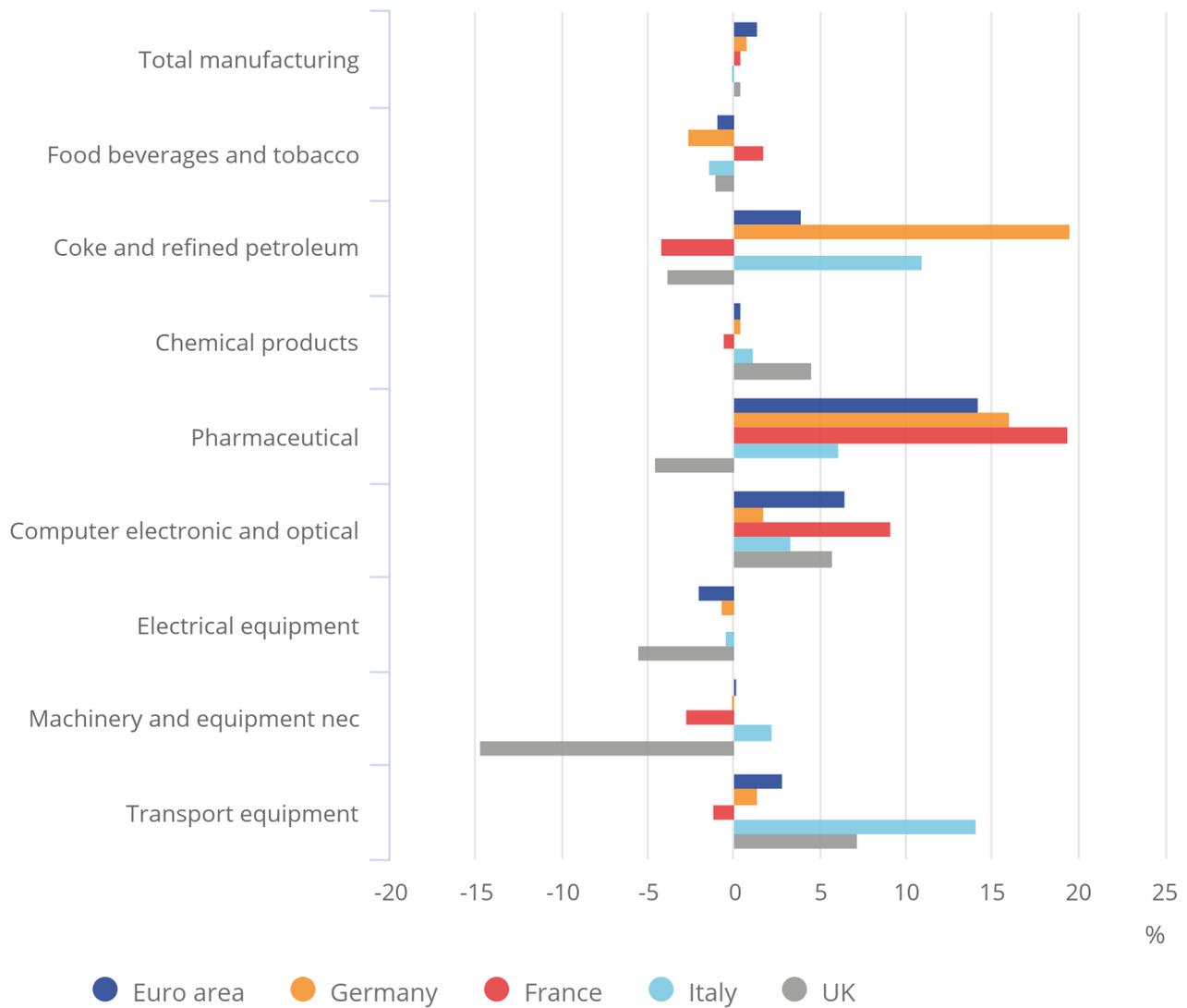
Figure 4 also shows that the UK's comparable strength was concentrated in the manufacture of "chemical products", which was offset by relative weakness in the manufacture of "machinery & equipment not else classified", "electrical equipment" and "basic pharmaceutical products".

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

June 2015 compared with June 2014

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June 2015 compared with June 2014



Source: Eurostat, Office for National Statistics

Notes:

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

6 . Gross domestic product (GDP) impact and components

In this release there are no periods open for revision, in line with the [National Accounts revisions policy \(43.3 kb Pdf\)](#) and therefore, there is no impact on the previously published GDP estimates.

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 Jun) 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 two 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 July 2015 will be published on 11 September 2015 and services output for the same period on 30 September 2015.

Table 2: GDP component table, July 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 ³	Percentage change	
						Most recent month on the same month a year ago ³	Most recent month on the previous month
Index of Production ¹	14.6	09 Sep	Jul	1.4	0.3	0.8	-0.4
			Jun	1.5	0.7	1.5	-0.4
Construction	6.4	14 Aug	Jun	2.4	0.2	2.6	0.9
Index of services	78.4	28 Aug	Jun	2.8	0.7	3.0	0.5
			May	2.8	0.4	2.6	0.2
Retail Sales		20 Aug	Jul	4.3	0.5	4.2	0.1
			Jun	4.4	0.7	4.2	-0.1
Agriculture	0.6		Q2 2015 ²	0.2	-0.1

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. Q2 = April to June

7 . Production and sectors supplementary analysis

Table 3: Headline growth rates to the Index of Production, July 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	0.8	0.8	-0.4	-0.4
Sector B	15.7	6.7	0.92	0.4	0.05
Division 06	12.9	9.0	0.89	-0.4	-0.04
Sector C	69.4	-0.5	-0.33	-0.8	-0.55
Sector D	7.1	-2.5	-0.17	1.3	0.09
Sector E	7.9	5.2	0.43	0.5	0.05

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 July 2014 and July 2015

Growth rates can be found in the chart download or in the attached IoP 5 tables

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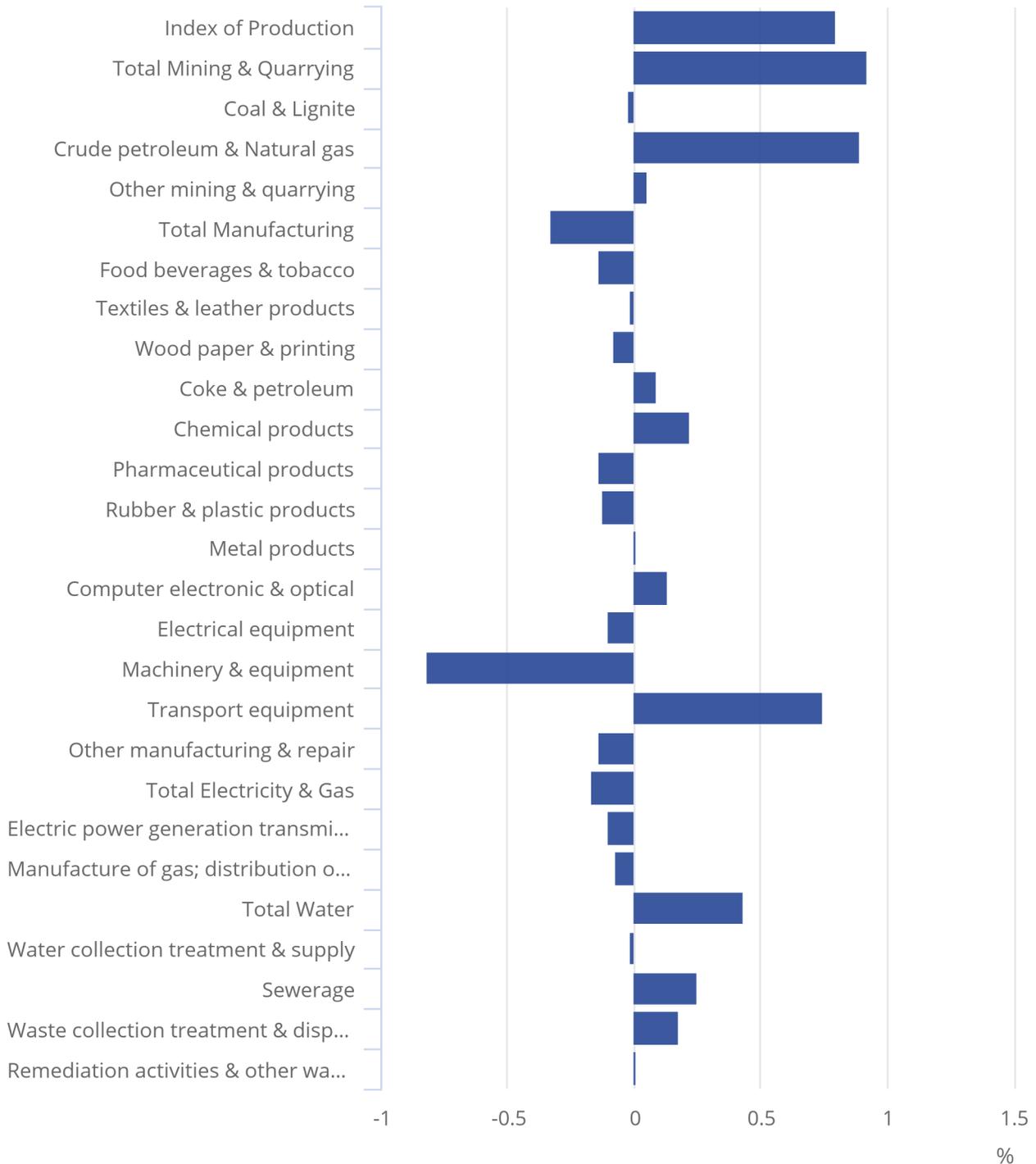
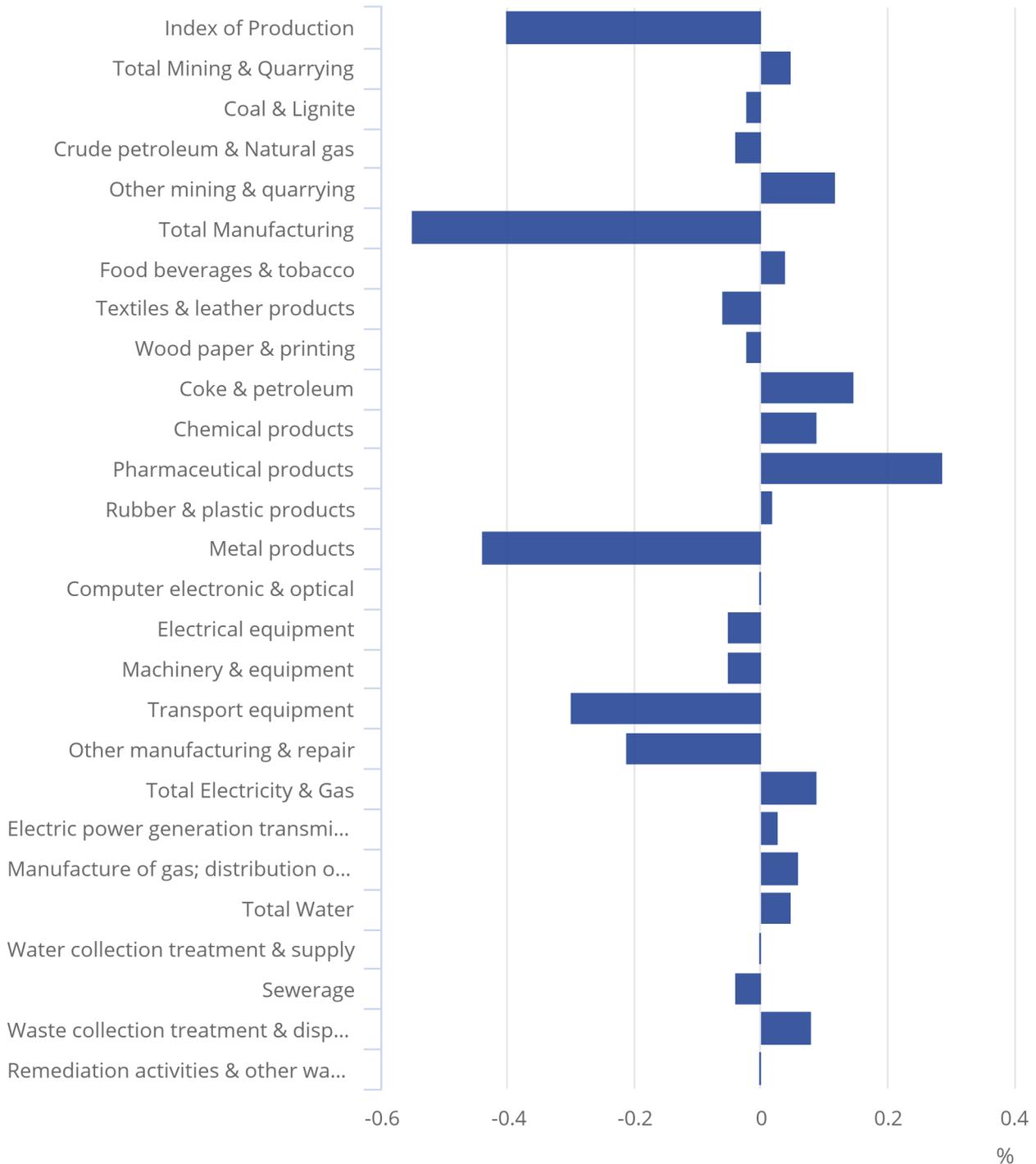


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Total production

Total production output in July 2015 increased by 0.8% compared with July 2014 (Table 3). This increase reflected rises in 2 of its 4 main sectors, with mining & quarrying having the largest contribution, increasing by 6.7% and contributing 0.9 percentage points to total production. The increase in mining & quarrying was followed by an increase in water supply, sewerage & waste management output, which increased by 5.2% and contributed 0.4 percentage points to total production. These increases were partially offset by decreases in manufacturing (the largest component in production), which decreased by 0.5% and contributed 0.3 percentage points and in electricity, gas, steam & air-conditioning output, which decreased by 2.5% and contributed 0.2 percentage points to total production (Figure 5).

Between June 2015 and July 2015, total production decreased by 0.4% (Table 3), having had an equivalent decrease the previous month. Manufacturing, the only main sector to fall, decreased by 0.8% and contributed 0.6 percentage points to total production. Partially offsetting this decrease were increases in electricity, gas, steam & air conditioning output, which increased by 1.3% and contributed 0.1 percentage points; mining & quarrying, which increased by 0.4% and contributed 0.1 percentage points; and water supply, sewerage & waste management output, which increased by 0.5% with minimal contribution to total production (Figure 6).

Manufacturing

Manufacturing output decreased by 0.5% between July 2014 and July 2015, the first decrease since August 2013 and contributed 0.3 percentage points to the fall in total production. Output decreased in 8 of the 13 manufacturing subsectors compared with a year ago (Figure 5). 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 15.9%. This was the 10th consecutive decrease since September 2014 and anecdotal evidence suggested that decreased exports were a contributing factor 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 subsector increased by 6.1% and contributed 0.7 percentage points. The main contributor within this sub-sector was the manufacture of air, spacecraft & related machinery, which increased by 17.2% and contributed 0.8 percentage points to total production, continuing the trend this industry has shown from September 2014.

Manufacturing output decreased by 0.8% between June 2015 and July 2015, having increased by 0.2% in the previous month. There were decreases in 7 of the 13 manufacturing sub-sectors (Figure 6). The manufacturing sub-sector with the largest contribution to the decrease in total production was the manufacture of basic metals & metal products, which decreased by 5.7% and contributed 0.4 percentage points. This weakness followed an increase in output of 4.9% in the previous month and it was reflected across all industries within this sub-sector. The largest contribution to the decrease was from the manufacture of weapons & ammunition, which decreased by 29.0%, following an increase of 31.3% in the previous month and contributed 0.2 percentage points to total production. This industry is contract-based, hence monthly volatility is to be expected.

In contrast to the above decreases, the manufacturing sub-sector with the largest upward contribution to total production was basic pharmaceutical products & pharmaceutical preparations, which increased by 5.8% and contributed 0.3 percentage points to total production, having decreased by 10.7% in the previous month. Anecdotal evidence suggested strong export sales were a contributing factor to the strength in this industry.

Mining and quarrying

Mining & quarrying output increased by 6.7% between July 2014 and July 2015, the fourth consecutive increase since March 2015, contributing 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 9.0% and contributed 0.9 percentage points to total production (Figure 5). This was due to increases over recent months in crude oil production compared with last year, when planned maintenance in a number of terminals hampered production.

Mining & quarrying output increased by 0.4% in July 2015 compared with June 2015 and contributed 0.1 percentage points to total production. This followed a decrease of 3.8% in the previous month. The sub-sector with the largest upward contribution was other mining & quarrying, which increased by 3.3% and contributed 0.1 percentage points to total production (Figure 6). Anecdotal evidence suggested increased exports were a contributing factor.

Electricity, gas, steam & air conditioning

Electricity, gas, steam & air conditioning output decreased by 2.5% in July 2015 compared with July 2014 and contributed 0.2 percentage points to total production (Figure 5). This reflected a decrease in output in both of its sub-sectors. The subsector with the larger contribution to the decrease was electric power generation, transmission & distribution, which decreased by 2.1% and contributed 0.1 percentage points to total production. Evidence from the Department of Energy and Climate Change (DECC) suggested that the decrease was mainly attributed to energy efficiencies and to a lesser extent, due to increased micro-generation (households and businesses generating for themselves, for example via solar panels).

Electricity, gas, steam & air conditioning output increased by 1.3% in July 2015 compared with June 2015 and contributed 0.1 percentage points to total production (Figure 6), having decreased by 0.3% in the previous month. This reflected an increase in output in both of its sub-sectors. The larger contributor to the increase was the manufacture of gas & distribution of gaseous fuels through mains, which increased by 2.9% and contributed 0.1 percentage points to total production.

Water & waste management

Water supply, sewerage & waste management output increased by 5.2% in July 2015 compared with July 2014 and contributed 0.4 percentage points to total production. This increase reflected a rise in 3 of its 4 sub-sectors (Figure 5), with the largest contribution coming from sewerage, which increased by 10.6% and contributed 0.2 percentage points to total production.

Water supply, sewerage & waste management output increased by 0.5% between June 2015 and July 2015, with a minimal contribution to total production. This was the seventh consecutive increase since December 2014. This increase reflected rises in 3 of its 4 sub-sectors (Figure 6). The largest contribution was from waste collection, treatment & disposal activities, which increased by 2.4% and contributed 0.1 percentage points to total production. Anecdotal evidence suggested higher exports may have contributed to the increase.

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 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, there are no revisions to previous periods.

8 . Industry spotlight: Manufacture of machinery and equipment not elsewhere classified

Industry CK covers the “Manufacture of machinery and equipment n.e.c” in the Index of Production data and accounts for around 7.8% of manufacturing output. According to the Standard Industrial Classification (SIC07), this industry includes the manufacture of general-purpose machinery (division 28.1) and other general-purpose machinery (division 28.2). The industry also includes the manufacture of agricultural and forestry machinery (division 28.3), the manufacture of metal forming machinery and machine tools (division 28.4) and the manufacture of other special-purpose machinery (division 28.9).

Between Q1 (Jan to Mar) 1997 and Q4 (Oct to Dec) 2002 it followed a downward trend that was more pronounced than in total manufacturing. However, between Q1 (Jan to Mar) 2003 and Q4 (Oct to Dec) 2007 the industry experienced a period of steady growth, rising at a compound growth rate of 0.9% per quarter and reaching its pre-downturn peak in Q4 (Oct to Dec) 2007. During the economic downturn, output in the industry contracted sharply, falling by 24.3% between Quarter 1 (Jan to Mar) 2008 and Quarter 3 (July to Sep) 2009, a more marked fall than total manufacturing which fell by 12.4 % over the same period. Between the 2008 and 2009 calendar years, the number of new businesses created in this industry fell by 31.3% while the number of firms that ceased to trade rose by 12.5%, coinciding with this contraction in output ([Business Demography, 2013](#)). However, the industry’s output recovered more strongly than total manufacturing, surpassing its pre-downturn peak in Quarter 4 (Oct to Dec) 2010, and continued to grow at a variable pace until Quarter 2 (Apr to June) 2012, when it reached its peak. However, the industry has generally been in decline since, despite a period of growth in late 2013 to early 2014, and output is now 21.2% below its peak in Quarter 2 (Apr to June) 2012.

Figure 7: Quarterly manufacturing output of machinery and equipment not elsewhere classified, seasonally adjusted, Quarter 1 (Jan to Mar) 1997 to Quarter 2 (Apr to June) 2015, UK

Figure 7: Quarterly manufacturing output of machinery and equipment not elsewhere classified, seasonally adjusted, Quarter 1 (Jan to Mar) 1997 to Quarter 2 (Apr to June) 2015, UK

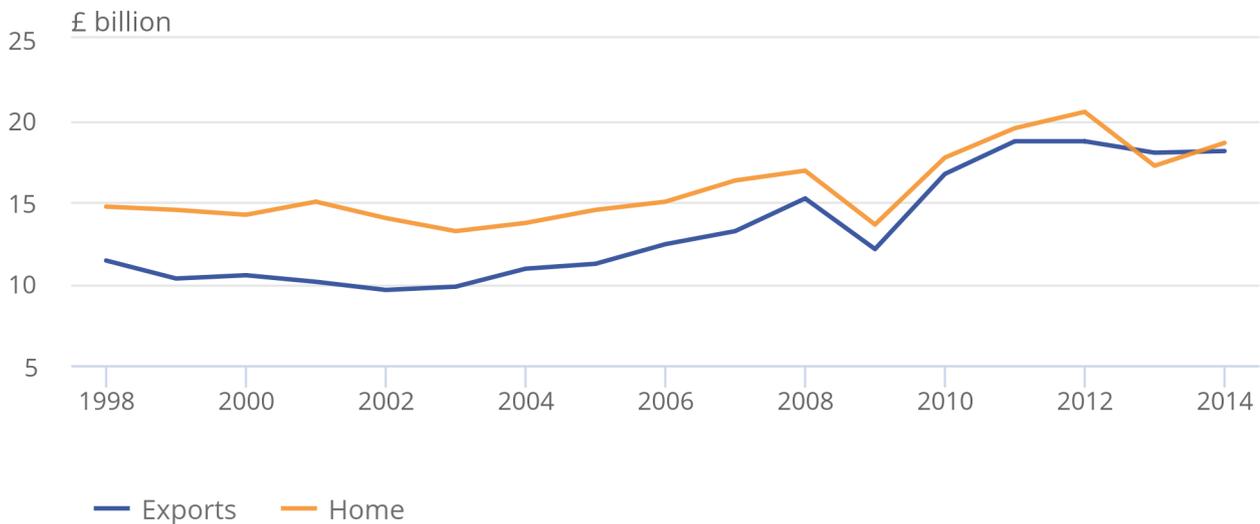


Source: Primarily Monthly Business Survey (Production and Services) - Office for National Statistics

According to the [annual business survey](#) (ABS) in 2013 industry 28 generated around £35 billion of turnover, representing 6.8% of total manufacturing. Around 90% of the total turnover of this industry originated in divisions 28.1 general-purpose machinery, 28.2 other general-purpose machinery and 28.9 other special-purpose machinery. The [‘turnover and orders in production and services industries’](#) (TOPSI) publication separates total turnover into export turnover and home turnover. The total turnover of this industry has been led mainly by domestic turnover since 1998, with the exception of 2013 when export turnover was higher than home turnover. Home turnover and export turnover grew at a moderate pace between 1998 and 2008, increasing at a compound growth rate of 1.4% and 3.0% per annum, respectively. During the economic downturn the export and home turnovers fell by around 20% each. However, following the downturn both turnovers recovered strongly reaching their peaks in 2012, coinciding with the peak observed in the output of this industry. However, since 2012 the export and home turnovers experienced some decline and in 2014 they were 3.3% and 9.2 % below their respective peaks.

Figure 8: UK turnover and orders in manufacture of machinery and equipment, not elsewhere classified

Figure 8: UK turnover and orders in manufacture of machinery and equipment, not elsewhere classified



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

9. Background notes

1. What's new?

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) planned for September 2015.

Upcoming changes

Blue Book 2015

The Index of Production for August 2015 to be published on 7 October 2015 will include revisions back to January 1997. This will be in line with the open revision period for the 2015 Blue Book publication in October 2015. The estimates will also be consistent with the Quarterly National Accounts published on 30 September 2015.

These annual changes will include updating the reference year from 2011=100 to 2012=100, along with adding an additional year of chain-linking weights for 2012.

VAT Project update

An article titled [Feasibility study into the use of HMRC turnover data within Short-term Output Indicators and National Accounts](#) has been published (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. 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 our 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 \(34.5Kb Excel sheet\)](#) back to 2010.

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

	Year	Period	Percentage	
			Turnover	Questionnaire
MBS overall	2015	Jul	88.8	75.0
		Jun	94.3	82.8
		May	95.7	85.4
		Apr	95.4	85.8
MBS production only	2015	Jul	85.5	79.0
		Jun	95.1	86.0
		May	96.6	88.0

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 software called X-13-ARIMA-SEATS. 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 July 2008 and June 2014 and the estimates published 12 months later.

Table 5: Revisions, July 2015, UK

Growth rates	Value in latest period	Revisions between first publication and estimates 12 months later	
		Average over the last 60 months	Average over the last 60 months without regard to sign (average absolute revision)
Production - 3 month	0.3	-0.15	0.28
Manufacturing - 3 month	-0.8	-0.12	0.27
Production - 1 month	-0.4	-0.10	0.26
Manufacturing - 1 month	-0.8	-0.05	0.25

Source: Office for National Statistics

[Spreadsheets give revisions triangles \(4.55 Mb ZIP\)](#) 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 [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.

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

[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).

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.

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.

11. **Next publication:** Wednesday 7 October 2015

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12. Details of the policy governing the release of new data are available by visiting the [Statistics Authority website](#) or from the Media Relations Office email: media.relations@ons.gsi.gov.uk