

Northern Ireland Index of Production Quarter 3 (July-September) 2016



Date: 14 December 2016
Geographical Area: Northern Ireland
Theme: Economy Statistics
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Key points

- This is the first quarter of Northern Ireland (NI) Production Sector output results following the EU referendum on 23rd June 2016. The post-referendum picture is still emerging and will continue to do so over the coming quarters and years. It is not possible to separate out the specific impact of the referendum in this quarter from pre-existing trends.
- Provisional results from the seasonally adjusted Index of Production for the third quarter (July-September) of 2016 show that output in NI decreased over the quarter by 1.8% in real terms, with the UK as a whole also reporting a fall (-0.5%).
- Output in the production sector has been falling over each of the last three quarters, with the latest fall of 1.8% being the most marked since Quarter 2 (April-June) 2009.
- The production sector as a whole fell by 1.4% over the year, compared to growth of 1.1% in the UK.
- When the most recent four quarters are compared to the previous four quarters, output in the NI production sector decreased slightly by 0.2%, with the whole of the UK reporting growth (0.9%) on this basis.
- The output from the overall production industries in Quarter 3 2016 remains below (4.0%) the peak output level recorded in Quarter 4 (October-December) 2007 but is some 12.8% above the low point recorded in quarter 3 2009.

Figure 1: Index of Production, Northern Ireland and UK



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National Statistics

The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics.

National Statistics status means that official statistics meet the highest standards of trustworthiness, quality, and public value.

All official statistics should comply with all aspects of the Code of Practice for Official Statistics. They are awarded National Statistics status following an assessment by the Authority's regulatory arm. The Authority considers whether the statistics meet the highest standards of Code compliance, including the value they add to public decisions and debate.

It is a producer's responsibility to maintain compliance with the standards expected of National Statistics. If we become concerned about whether these statistics are still meeting the appropriate standards, we will discuss any concerns with the Authority promptly. National Statistics status can be removed at any point when the highest standards are not maintained, and reinstated when standards are restored.

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Introduction and context

This bulletin provides provisional data from the Northern Ireland Index of Production (IOP) survey. The IOP is one of the earliest official indicators of the performance of Northern Ireland industry and, as such, represents an important short-term measure of change in a significant area of the economy. The contents of this report will be of interest to government policymakers, Members of the Legislative Assembly, the business community, economic commentators, academics and members of the general public with an interest in the state of the NI economy. A summary of uses is available on the website at <https://www.economy-ni.gov.uk/publications/methodology-and-usage-iop>

The latest Department for the Economy (DfE) economic commentary (March 2016) provides an overview of the state of the Northern Ireland economy, setting it in context with the UK and Republic of Ireland. This can be found at <https://www.economy-ni.gov.uk/publications/deti-economic-commentary>

The most up-to-date official statistics on the economy and labour market, including those published on the same day as the Northern Ireland Index of Services and Index of Production, are available on the economic overview page of the DfE website at <https://www.economy-ni.gov.uk/articles/economic-overview>

The separate Northern Ireland Index of Services (IOS) provides an important short-term measure of change in the output of the private services sector of the economy. It is based on up-to-date information about the output and sales of the services industry. Provisional figures for IOS for the third quarter of 2016 showed that output, in real terms, decreased by 0.5% over the quarter and increased by 2.8% over the year. The index has recovered by 7.1% since the recent minimum value recorded in quarter 2 2012. Further information and results from the NI IOS can be accessed at <https://www.economy-ni.gov.uk/topics/statistics-and-economic-research/index-services>

The Index of Production is published on a Standard Industrial Classification 2007 (SIC07) basis. This has an impact on the type of businesses classified as production sector. For example, publishing activities move from the production to the services sector and sewerage and waste disposal moves from services to the production sector. Within the production sector, there are some new groupings of businesses. IOP data prior to quarter 2 2011 were collected on a SIC03 basis and it has been converted to approximate the SIC07 coverage. Further detail can be found in the background notes (section 8).

The background notes in Section 8 of this publication provide detailed information on the methodology used to produce the statistics as well as information on the quality and accuracy of the data. This bulletin contains detailed results for the production industries i.e. the mining & quarrying, the manufacturing, the electricity, gas, steam and air conditioning supply and the water supply, sewerage, waste management (inc. recycling) sectors on a 2013=100 basis. These data are seasonally adjusted (where stated).

Manufacturing is typically the main determinant of change in the production sector, representing 82.1% of the approximate Gross Value Added (GVA) in the production industries. The other elements of the index relate to water supply, sewerage, waste management (inc. recycling) which represents around 9.0% of the index; electricity, gas,

steam and air conditioning supply which represents around 7.1% and mining and quarrying which represents around 1.8%.

Comparative UK data (produced by the Office for National Statistics) are presented where these are available. The latest ONS IOP results on a comparative 2013=100 basis are available at

<http://www.ons.gov.uk/economy/economicoutputandproductivity/output/bulletins/indexofproduction/previousReleases>

Information on the manufacturing sub-sectors (e.g. food, drink, and tobacco) along with information by market sector (classifying production under one of three headings, according to the purpose for which output is intended i.e. investment goods, intermediate goods, and consumer goods) are included in the publication.

This publication provides three measures of growth for the Index. The quarter-on-quarter change provides the most recent measure of how the sector is changing. It is appropriate to compare consecutive quarters as the indices are seasonally adjusted, where appropriate, to remove the effects of changes in output as a result of the time of the year. We also provide comparisons with the same quarter one year ago and a comparison of the most recent twelve months with the twelve months before. The quarterly comparison over the year provides an additional control on seasonal effects. The comparison of the rolling annual average is useful for identifying changes in output over a longer period than the other two approaches.

Northern Ireland Production

Revisions

Results, particularly for the most recent quarter, are provisional and subject to revision as more up-to-date data become available (e.g. through late returns). Figures can also change as a result of the seasonal adjustment process, methodological changes or changes to classifications.

The Index of Production publication has published data on a 2013=100 basis to correlate with ONS publications. SIC07 deflators with the base year 2010=100 have been applied to all series.

The IOP revisions policy can be found at <https://www.economy-ni.gov.uk/articles/quality-and-revisions-0>

Date of next publication

The next Northern Ireland Index of Production publication is planned for 15th March 2017.

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Executive summary

Provisional results for quarter 3 (Jul-Sep) 2016

This is the first quarter of Production Sector output results following the EU referendum on 23rd June 2016. Provisional results from the Index of Production for the third quarter of 2016 showed that output in NI decreased by 1.8% over the quarter, while output in the UK as a whole fell by 0.5%. Output in the production sector has been falling over each of the last three quarters, with the latest fall of 1.8% being the most marked since Quarter 2 2009.

The production sector as a whole fell by 1.4% over the year, compared to growth of 1.1% in the UK.

When the most recent four quarters are compared to the previous four quarters, output in the NI production sector decreased slightly by 0.2%, with the whole of the UK reporting growth (0.9%) on this basis.

Table 1: Index of Production percentage change, Northern Ireland and UK

	NI	UK
Percentage change compared to:		
Previous quarter	-1.8%	-0.5%
Same quarter one year ago	-1.4%	1.1%
Most recent four quarters compared to previous four quarters	-0.2%	0.9%

Figure 2: Index of Production, Northern Ireland and UK



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The output from the overall production industries (seasonally adjusted) in Quarter 3 2016 remains slightly below (4.0%) the peak output level recorded in Quarter 4 2007 but is some 12.8% above the low point recorded in Quarter 3 2009.

Manufacturing (Seasonally Adjusted)

Manufacturing comprises the main element (82.1%) of the production index and therefore the manufacturing index has a similar profile to the overall production index. The manufacturing index remains below (-7.0%) the peak in Quarter 4 2007.

- Manufacturing output levels fell over the quarter by 2.6% (UK: decreased by 0.9%)
- Manufacturing output levels decreased by 2.4% compared to the same quarter one year ago whilst UK levels increased by 0.9% over the same period
- Manufacturing output levels fell by 0.4% over the most recent four quarters compared to the previous four quarters (UK: decreased by 0.5%)
- This quarter has seen the most marked decline in manufacturing since Quarter 2 2009

Manufacturing Productivity (Seasonally Adjusted)

The index of manufacturing productivity (which provides a measure of the number of units of output produced per person per paid hour) fell over the quarter (-2.5%) and fell over the year (-3.8%).

Other Production

The water supply, sewerage, and waste management sector (seasonally adjusted) increased over the quarter (0.5%) and over the year (2.9%). The NI index is 11.6% below the recent peak recorded in Quarter 1 (January-March) 2012, while the UK index recorded a rise of 14.9% over the same period.

The electricity, gas, steam and air conditioning supply sector (seasonally adjusted) reported a fall in output over the quarter (-0.5%) and a rise over the year (0.5%). The UK recorded a fall over the quarter (-4.2%) and over the year (-1.1%). The NI index is 8.0% below the peak recorded in Quarter 3 2008, with the UK reporting a similar fall of 10.3% over the same period.

The seasonally adjusted mining and quarrying sector (accounting for approximately 1.8% of the overall production index) reported growth in output of 7.2% compared to the previous quarter and an increase of 22.0% when compared to the same period a year earlier. The respective figures for the whole of the UK reported increases of 4.4% over the quarter and 3.6% over the year. Output remains some 9.7% below the peak reached in Quarter 4 2007; the UK index fell by 27.0% over the same period.

Comment

This is the first release of official statistics relating to production sector output for the quarterly period following the EU referendum. The post-referendum picture is still emerging and will continue to do so over the coming quarters and years. It is also not possible to separate out the specific impact of the referendum in this quarter from pre-existing trends. This is the first annualised¹ fall in output in the Production sector since Quarter 3 2013. This has been mainly driven by the slowdown in manufacturing, which has been evident since the beginning of the year, though it has gained pace in recent quarters.

¹ When the most recent four quarters are compared to the previous four quarters

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Production by broad industry groups

This section focuses on the performance of the sub-sectors which make up the overall production sector. The main industry categories of which it is comprised are listed in order of importance of the contribution made to the overall Index of Production.

Figure 3: Manufacturing² – SIC07 Section C (weight = 82.1%), Northern Ireland and UK



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Table 2: Manufacturing percentage change, Northern Ireland and UK

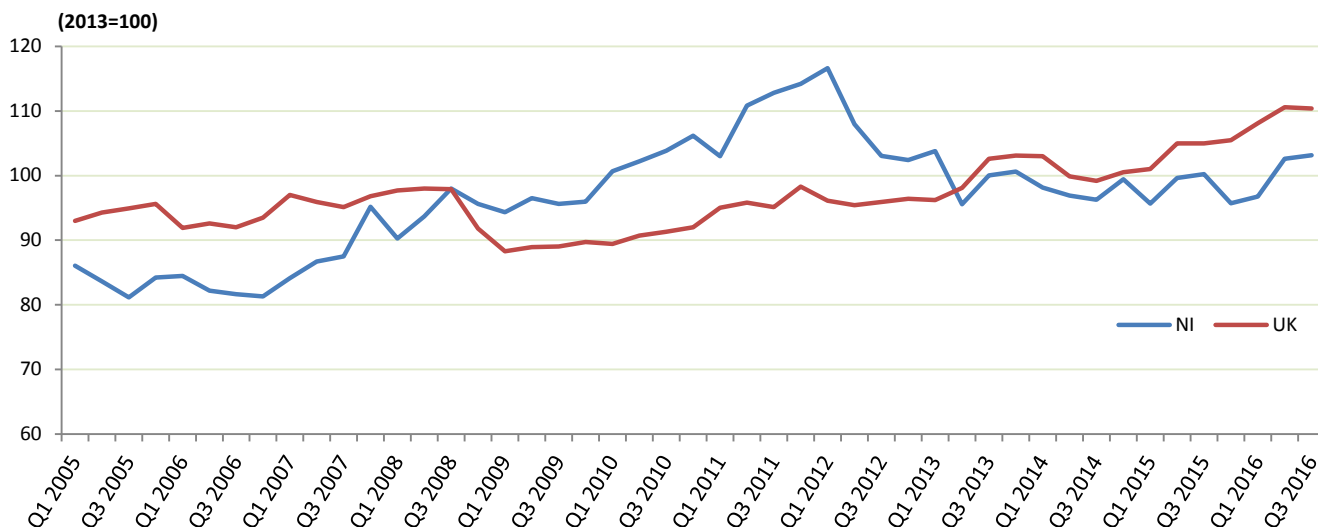
	NI	UK
Percentage change compared to:		
Previous quarter	-2.6%	-0.9%
Same quarter one year ago	-2.4%	0.9%
Most recent four quarters compared to previous four quarters	-0.4%	-0.5%

Manufacturing comprises the main element (82.1%) of the production index and therefore the manufacturing index has a similar profile to the overall production index. Manufacturing output decreased by 2.6% in real terms over the third quarter of 2016 and fell by 2.4% when compared to the same period a year earlier. By comparison, UK manufacturing output decreased by 0.9% over the quarter but increased by 0.9% over the year.

Further detail relating to manufacturing subsectors is given in section 4.

² The manufacturing sub-sector has been seasonally adjusted using X-13 ARIMA SEATS.

Figure 4: Water supply, sewerage, and waste management (inc. recycling)³ – SIC07 Section E (weight = 9.0%) (seasonally adjusted series), Northern Ireland and UK



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Table 3: Water supply, sewerage, and waste management (inc. recycling) percentage change, Northern Ireland

	NI	UK
Percentage change compared to:		
Previous quarter	0.5%	-0.2%
Same quarter one year ago	2.9%	5.1%
Most recent four quarters compared to previous four quarters	0.8%	5.6%

This sector remains below (-11.6%) the peak reached in Quarter 1 2012.

³ The water supply, sewerage and waste management (inc. recycling) sub-sector has been seasonally adjusted using X-13 ARIMA SEATS.

Figure 5: Electricity, gas, steam and air conditioning supply⁴ – SIC07 Section D (weight = 7.1%), Northern Ireland and UK



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Table 4: Electricity, gas, steam and air conditioning supply, Northern Ireland and UK

	NI	UK
Percentage change compared to:		
Previous quarter	-0.5%	-4.2%
Same quarter one year ago	0.5%	-1.1%
Most recent four quarters compared to previous four quarters	0.5%	-0.1%

This index has fallen 8.0% since the peak recorded in Quarter 3 2008, with the UK reporting a similar fall of 10.3% over this same period. The NI index has recovered 12.7% from the low point recorded in Quarter 2 2007 while the UK has recorded a fall of 7.7% over the same period.

⁴ The electricity, gas, steam and air conditioning supply sub-sector has been seasonally adjusted using X-13 ARIMA SEATS.

Figure 6: Mining and quarrying⁵ – SIC07 Section B (weight = 1.8%), Northern Ireland and UK



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Table 5: Mining and quarrying percentage change, Northern Ireland and UK

	NI	UK
Percentage change compared to:		
Previous quarter	7.2%	4.4%
Same quarter one year ago	22.0%	3.6%
Most recent four quarters compared to previous four quarters	3.4%	4.9%

The index is now 29.1% above the most recent low point recorded in Quarter 3 2009. This index is some 9.7% below the peak reached in Quarter 4 2007; the UK index fell further by 27.0% over the same period.

⁵ The mining and quarrying sub-sector has been seasonally adjusted using X-13 ARIMA SEATS.

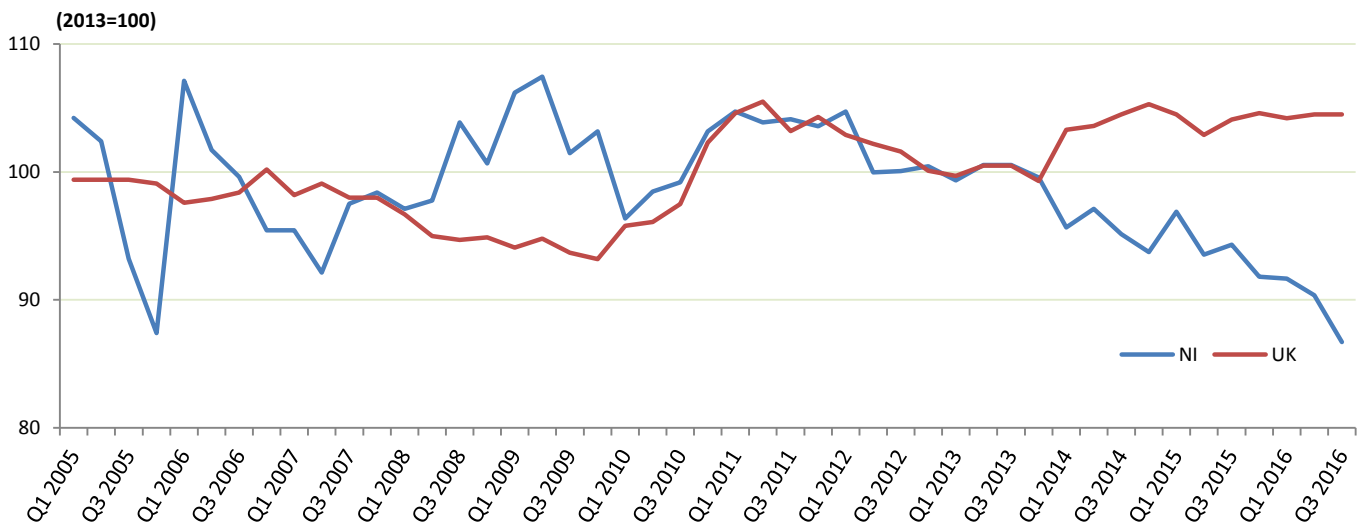
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Manufacturing subsectors

Manufacturing is the main component of the production sector accounting for some 82.1% of Regional Accounts Gross Value Added (GVA) within the overall production sector. This section focuses on the performance of the sub-sectors of manufacturing. They have been listed in order of importance of the contribution made to the overall Index of Production.

The fall has been most pronounced in manufacturing, where five of the six broad manufacturing subsectors are reporting quarterly decline. Food, beverages and tobacco and engineering and allied industries are the largest contributors to both the quarterly (-2.6%) and annual fall (-2.4%) in manufacturing output.

Figure 7: Food products, beverages & tobacco⁶ (weight = 25.0%), Northern Ireland and UK



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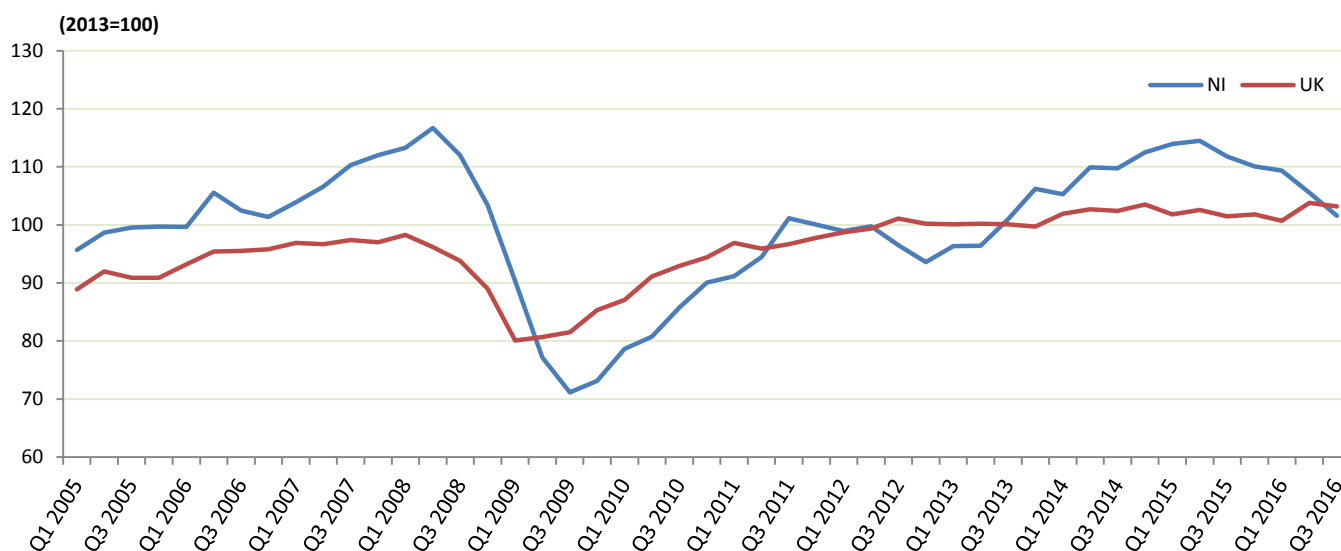
Table 6: Food products, beverages & tobacco percentage change, Northern Ireland and UK

	NI	UK
Percentage change compared to:		
Previous quarter	-4.0%	0.0%
Same quarter one year ago	-8.1%	0.4%
Most recent four quarters compared to previous four quarters	-4.7%	0.2%

This sector is currently reporting a low point and has fallen by 19.3% from the most recent high point in Quarter 2 2009.

⁶ The food products, beverages and tobacco manufacturing sub-sector has been seasonally adjusted using X-13 ARIMA SEATS.

Figure 8: Engineering & allied industries⁷ (weight = 24.2%), Northern Ireland and UK



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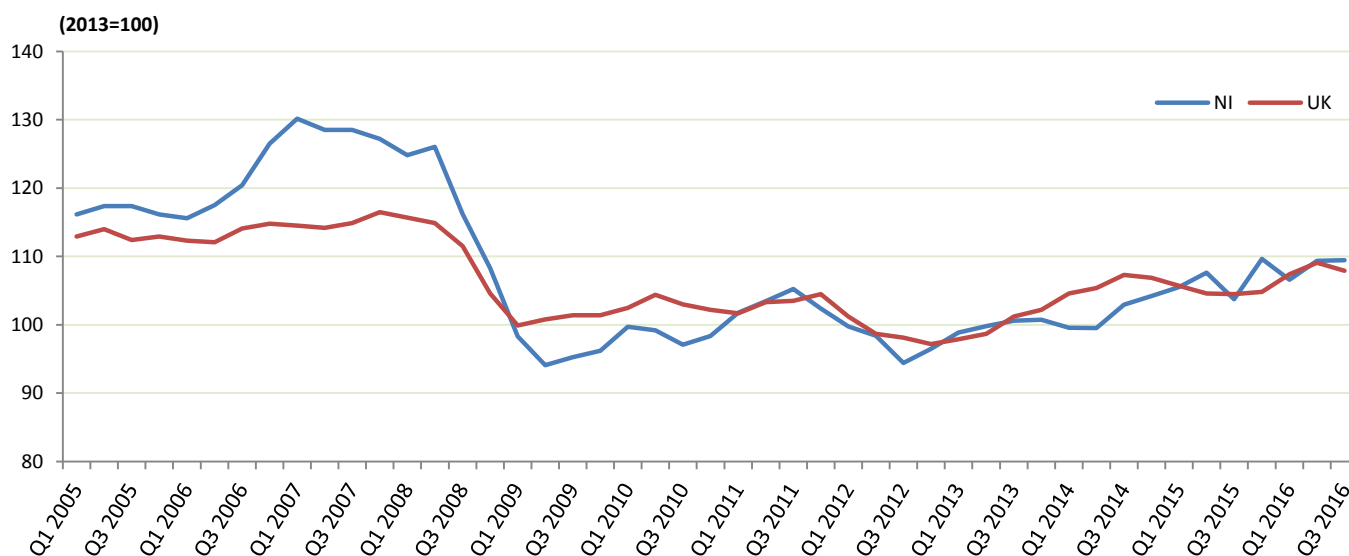
Table 7: Engineering & allied industries percentage change, Northern Ireland and UK

	NI	UK
Percentage change compared to:		
Previous quarter	-3.8%	-0.6%
Same quarter one year ago	-9.1%	1.7%
Most recent four quarters compared to previous four quarters	-5.8%	0.0%

This index has fallen 11.2% since the recent high point recorded in Quarter 2 2015, with the UK reporting an increase of 0.6% over this same period. The NI index has recovered 42.8% from the low point recorded in Quarter 3 2009.

⁷ The engineering and allied industries manufacturing sub-sector has been seasonally adjusted using X-13 ARIMA SEATS.

Figure 9: Total other manufacturing⁸ (weight = 16.1%), Northern Ireland and UK



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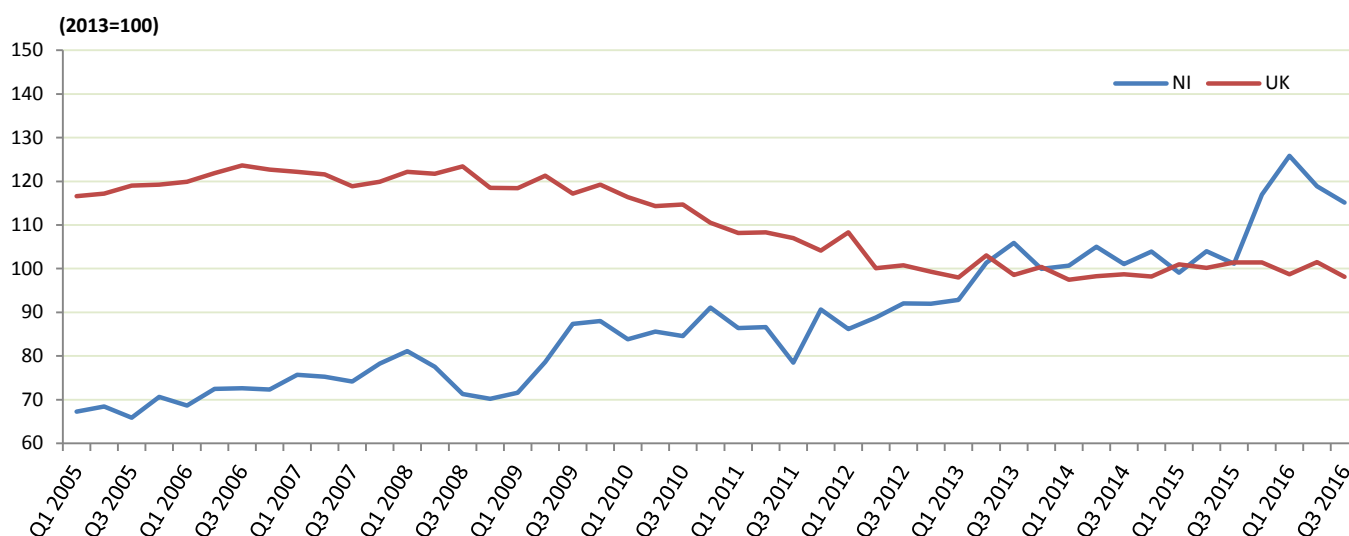
Table 8: Total other manufacturing percentage change, Northern Ireland and UK

	NI	UK
Percentage change compared to:		
Previous quarter	0.1%	-1.1%
Same quarter one year ago	5.5%	3.3%
Most recent four quarters compared to previous four quarters	3.3%	1.8%

This sector recorded a slight increase of 0.1% over the quarter and is 16.4% above the low point recorded in Quarter 2 2009. Overall recovery has been slow for this sector and it is some 15.9% below the peak of Quarter 1 2007.

⁸ The total other manufacturing sub-sector has been seasonally adjusted using X-13 ARIMA SEATS.

Figure 10: Manufacturing of chemical and pharmaceutical products⁹ (weight = 7.5%), Northern Ireland and UK



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Table 9: Manufacturing of chemical and pharmaceutical products percentage change, Northern Ireland and UK

	NI	UK
Percentage change compared to:		
Previous quarter	-3.2%	-3.3%
Same quarter one year ago	13.8%	-3.3%
Most recent four quarters compared to previous four quarters	16.8%	-0.3%

Output in this sector has fallen by 8.5% since the recent peak in Quarter 1 2016. However, the manufacturing of chemical and pharmaceutical products sector is now 74.6% above the pre-recession low recorded in Quarter 3 2005.

⁹ The manufacturing of chemical and pharmaceutical products manufacturing sub-sector has not been seasonally adjusted.

Figure 11: Basic and fabricated metal products¹⁰ (weight = 6.1%), Northern Ireland and UK



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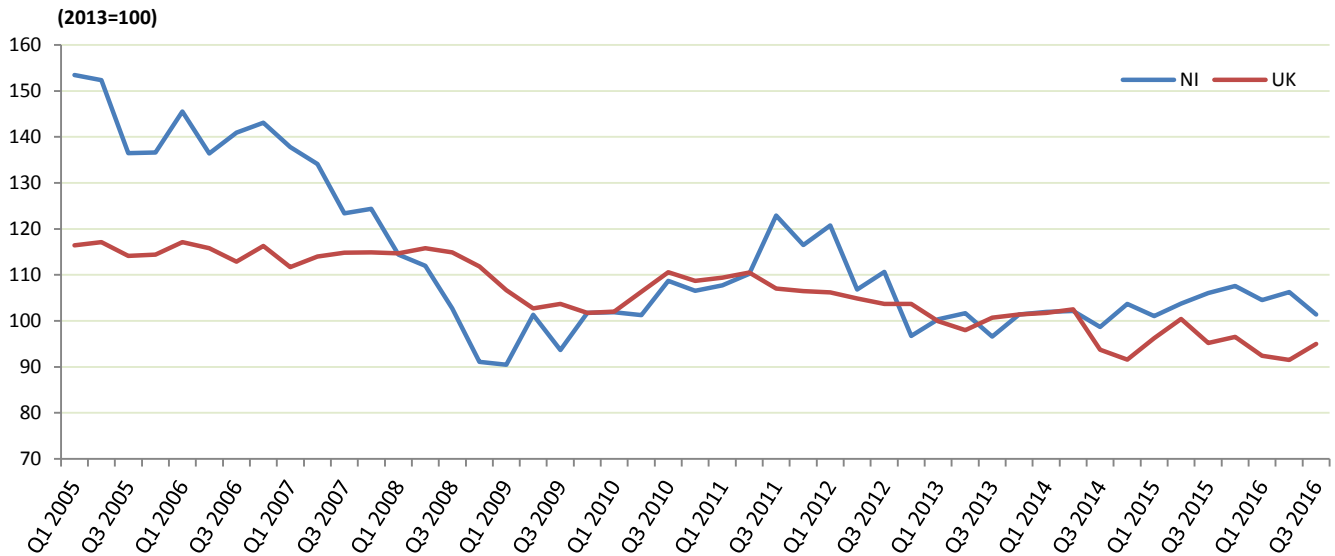
Table 10: Basic and fabricated metal products percentage change, Northern Ireland and UK

	NI	UK
Percentage change compared to:		
Previous quarter	-4.5%	0.0%
Same quarter one year ago	7.9%	-0.9%
Most recent four quarters compared to previous four quarters	9.2%	-2.6%

While this sector has fallen 5.6% from the peak recorded in Quarter 4 2015, it has recovered significantly by 72.0% from the minimum level recorded in Quarter 3 2010.

¹⁰ The basic and fabricated metal products manufacturing sub-sector has been seasonally adjusted using X-13 ARIMA SEATS.

Figure 12: Textiles, leather & related products¹¹ (weight = 3.3%), Northern Ireland and UK



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Table 11: Textiles, leather & related products percentage change, Northern Ireland and UK

	NI	UK
Percentage change compared to:		
Previous quarter	-4.6%	3.8%
Same quarter one year ago	-4.4%	-0.2%
Most recent four quarters compared to previous four quarters	1.2%	-2.1%

The index has fallen 17.5% since the most recent peak in Quarter 3 2011; however, the index has recovered by 12.1% from the minimum level recorded in Quarter 1 2009.

¹¹ The textiles, leather and related products manufacturing sub-sector has been seasonally adjusted using X-13 ARIMA SEATS.

5

Market sector analysis

Market sector analysis classifies production under one of three headings which are derived from the main SIC classification groups.

Investment goods – also known as capital goods – are the plant, equipment and inventories used to produce goods for consumption. Companies will invest further in these kinds of goods when they are looking to expand their production or upgrade existing equipment.

Intermediate goods are those purchased by the industry as inputs into the final production of goods. This category would include the materials (such as cement, rubber, plastic, chemicals and electronics) which will ultimately be used to produce a good for consumption.

Consumer goods are the final goods produced by industry which are intended for purchase by private consumers. These goods are consumed by the mass market rather than used in the production of another good and are therefore closely linked to consumer demand and the factors which influence this.

It should be noted that these groups are for illustrative purposes as there can be overlap where manufacturer goods could be used as capital to produce another good but will also be used for consumption (e.g. motor vehicles).

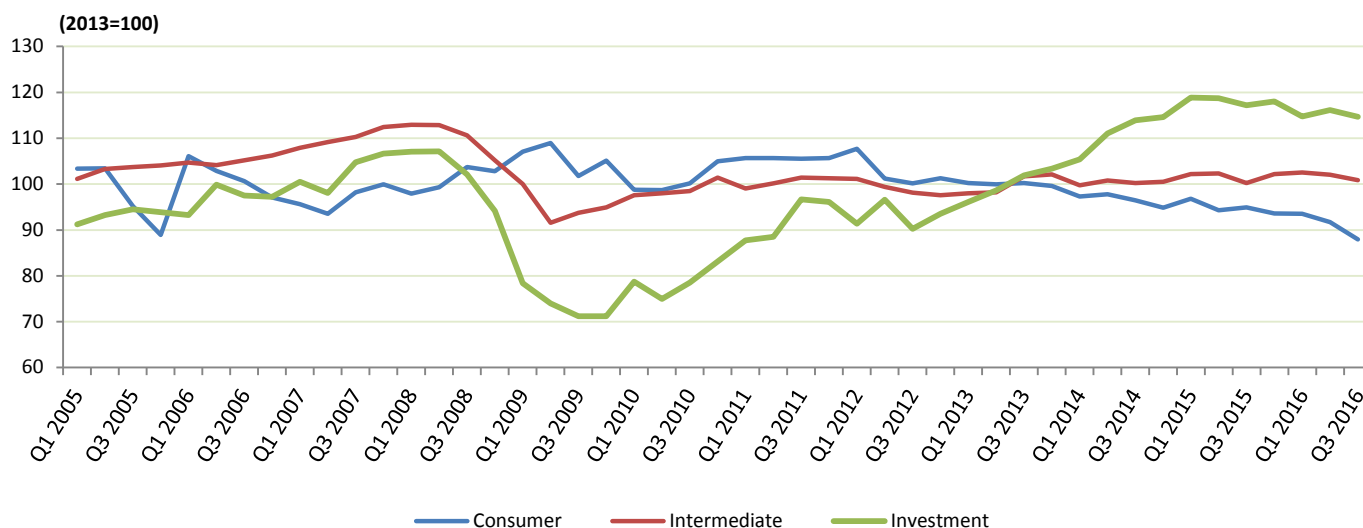
Table 12: Index of Production by Market Sector Goods¹² (annual data)

	Consumer Goods (42.5%¹³) Seasonally Adjusted	Intermediate Goods (39.6%¹²) Seasonally Adjusted	Investment Goods (17.9%¹²) Seasonally Adjusted
2005	98	103	93
2006	102	105	97
2007	97	110	102
2008	101	111	102
2009	106	95	74
2010	101	99	79
2011	106	101	92
2012	103	99	93
2013	100	100	100
2014	97	100	111
2015	95	102	118

¹² The market sector goods have been seasonally adjusted using X-13 ARIMA SEATS.

¹³ The regional GVA weights relate to 2013.

Figure 13: Market Sector Goods, Northern Ireland



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Table 13: Index of Production by Market Sector Goods percentage change, Northern Ireland

	Consumer Goods	Intermediate Goods	Investment Goods
Percentage change compared to:			
Previous quarter	-4.1%	-1.2%	-1.2%
Same quarter one year ago	-7.3%	0.7%	-2.1%
Most recent four quarters compared to previous four quarters	-3.7%	0.6%	-1.2%

Consumer Goods (Seasonally Adjusted) (weight 42.5%)

The consumer goods category has experienced general decline since the peak in Quarter 2 2009, the index has decreased by 19.3% since that point.

Intermediate Goods (Seasonally Adjusted) (weight 39.6%)

After experiencing a sharp fall between 2008 and 2009, this category has been showing a small level of growth since its minimum in Quarter 2 2009. The index has recovered by 10.1% since this point.

Investment Goods (Seasonally Adjusted) (weight 17.9%)

The significant falls in output experienced from 2008 where the index fell between quarter 1 2008 and Quarter 3 2009 reflects the impact of the global recession on businesses, with many companies looking to survive as the economy contracted. In Quarter 3 2016 investment goods have seen a decline in output over the quarter (-1.2%) and also experienced a decrease over the year (-2.1%). However, this category has shown significant recovery of 61.2% from the low point recorded in Quarter 2 2009.

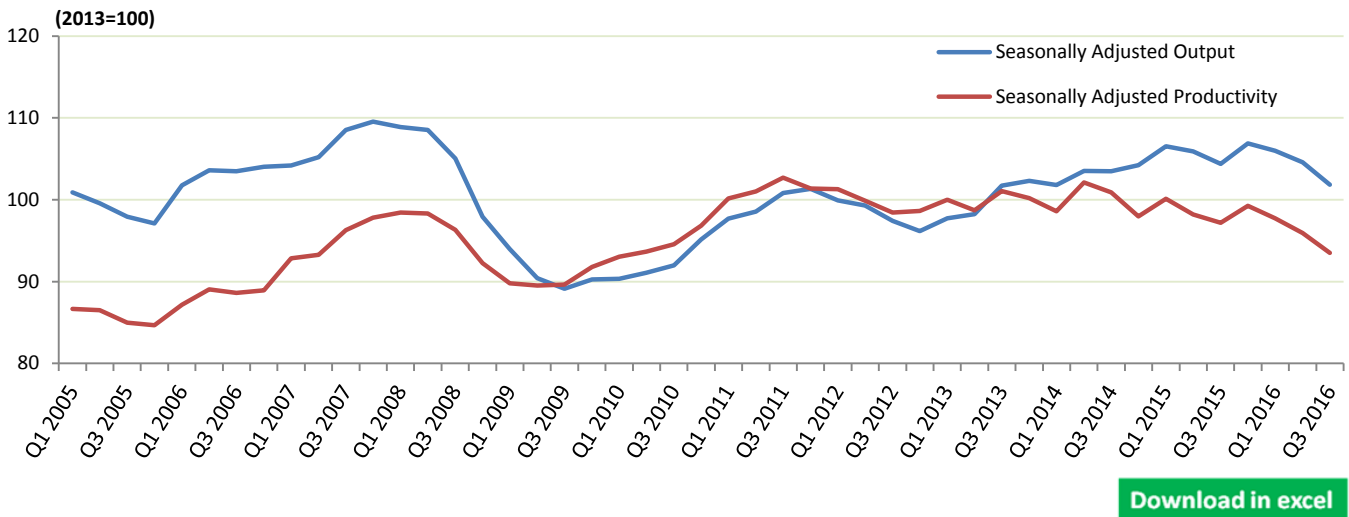
6

Seasonally adjusted index of manufacturing productivity

The seasonally adjusted index of manufacturing productivity¹⁴ provides a measure of the number of units of output produced per person per paid hour. The index includes seasonally adjusted employees in employment, the seasonally adjusted manufacturing index and average weekly hours (based on hours worked for full-time adult manufacturing workers including overtime from the Annual Survey of Hours and Earnings).

The index of manufacturing productivity recorded a fall of 2.5% over the quarter and a fall of 3.8% over the year. The index also reported a decrease of 1.8% over the latest four quarters compared to the previous four quarters. Since mid-2009, output and productivity have been very similar. However, since the start of 2013, output has been greater than productivity.

Figure 14: Manufacturing output & productivity, Northern Ireland



The most recently published Quarterly Employment Survey seasonally adjusted figures for September 2016 (based on the 2007 Standard Industrial Classification) reported a decrease of 0.1% over the quarter in employee jobs in the manufacturing sector and a rise of 1.4% over the year.

Table 14: Seasonally adjusted index of manufacturing productivity, Northern Ireland

Annual Average		Annual Average	
2005	86	2012	100
2006	88	2013	100
2007	95	2014	100
2008	96	2015	99
2009	90		
2010	94		
2011	101		

¹⁴ The index of manufacturing productivity has been seasonally adjusted using X-13 ARIMA SEATS.

Table 15: Seasonally adjusted index of manufacturing productivity percentage change, Northern Ireland

	NI
Percentage change compared to:	
Previous quarter	-2.5%
Same quarter one year ago	-3.8%
Most recent four quarters compared to previous four quarters	-1.8%

7

Quarterly/annual/rolling annual average changes

Table 16: Index of Production – Quarterly, annual and rolling annual average¹⁵ changes by sector, Northern Ireland

		All Production industries - Sections B, C, D, E (seasonally adjusted)				Manufacturing – Section C (seasonally adjusted) weight ¹⁶ = 82.1%				Water, supply & waste management – Section E (seasonally adjusted) weight ¹⁵ = 9.0%				Electricity, gas, steam & air conditioning – Section D (seasonally adjusted) weight ¹⁵ = 7.1%				Mining & quarrying – Section B (seasonally adjusted) weight ¹⁵ = 1.8%			
		Index	% Change			Index	% Change			Index	% Change			Index	% Change			Index	% Change		
			Quarter	Annual	Rolling		Quarter	Annual	Rolling		Quarter	Annual	Rolling		Quarter	Annual	Rolling		Quarter	Annual	Rolling
2005	Q1	96.9	-	-	-	100.9	-	-	-	86.1	-	-	-	88.4	-	-	-	72.1	-	-	-
	Q2	96.8	-0.1	-	-	99.6	-1.3	-	-	83.6	-2.8	-	-	105.2	19.0	-	-	88.6	22.9	-	-
	Q3	94.9	-1.9	-	-	97.9	-1.6	-	-	81.1	-3.0	-	-	96.1	-8.6	-	-	95.7	8.0	-	-
	Q4	95.1	0.2	-	-	97.1	-0.8	-	-	84.2	3.8	-	-	95.4	-0.8	-	-	105.1	9.9	-	-
2006	Q1	98.2	3.3	1.3	-0.7	101.8	4.8	0.8	-1.8	84.5	0.3	-1.9	-3.1	93.8	-1.6	6.2	10.5	90.1	-14.3	24.9	31.6
	Q2	99.9	1.7	3.2	0.2	103.6	1.8	4.0	-0.1	82.2	-2.7	-1.7	-2.2	94.6	0.8	-10.1	-1.8	98.8	9.6	11.5	21.2
	Q3	100.0	0.1	5.4	2.2	103.5	-0.1	5.7	2.0	81.7	-0.7	0.6	-0.6	91.8	-3.0	-4.5	-2.7	107.6	8.9	12.4	17.4
	Q4	100.2	0.2	5.3	3.8	104.0	0.5	7.1	4.4	81.3	-0.5	-3.5	-1.6	90.1	-1.9	-5.6	-3.8	108.7	1.1	3.4	12.1
2007	Q1	100.5	0.3	2.3	4.0	104.2	0.1	2.4	4.8	84.1	3.5	-0.4	-1.3	89.3	-0.9	-4.8	-6.3	114.5	5.3	27.1	13.2
	Q2	101.2	0.7	1.3	3.5	105.2	1.0	1.6	4.1	86.7	3.1	5.5	0.5	86.6	-3.1	-8.5	-5.8	116.9	2.0	18.3	14.9
	Q3	104.3	3.1	4.3	3.3	108.5	3.1	4.9	3.9	87.5	0.9	7.1	2.1	88.7	2.5	-3.4	-5.6	117.8	0.8	9.6	14.0
	Q4	106.0	1.7	5.9	3.5	109.5	0.9	5.3	3.5	95.1	8.8	17.1	7.2	91.2	2.7	1.2	-3.9	118.2	0.3	8.8	15.4
2008	Q1	105.4	-0.6	4.9	4.1	108.9	-0.6	4.5	4.1	90.3	-5.1	7.3	9.2	98.1	7.7	9.9	-0.3	99.9	-15.5	-12.8	5.4
	Q2	105.2	-0.2	4.0	4.8	108.5	-0.3	3.2	4.5	93.7	3.8	8.0	9.8	104.8	6.8	21.0	7.0	92.6	-7.3	-20.8	-4.3
	Q3	102.9	-2.3	-1.4	3.3	105.1	-3.2	-3.2	2.4	98.0	4.6	12.0	11.0	106.0	1.2	19.5	12.8	87.5	-5.6	-25.8	-13.0
	Q4	97.7	-5.0	-7.9	-0.2	97.9	-6.8	-10.6	-1.6	95.6	-2.5	0.5	6.8	103.0	-2.9	13.0	15.8	84.0	-4.0	-29.0	-22.1

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¹⁵ The change in the rolling annual average measures the change in the average of the latest four quarters against the same four quarters one year previous.

¹⁶ The regional GVA weights relate to 2013.

Table 16 (cont): Index of Production – Quarterly, annual and rolling annual average¹⁷ changes by sector, Northern Ireland

		All Production industries - Sections B, C, D, E (seasonally adjusted)				Manufacturing – Section C (seasonally adjusted) weight ¹⁸ = 82.1%				Water, supply & waste management – Section E (seasonally adjusted) weight ¹⁷ = 9.0%				Electricity, gas, steam & air conditioning – Section D (seasonally adjusted) weight ¹⁷ = 7.1%				Mining & quarrying – Section B (seasonally adjusted) weight ¹⁷ = 1.8%			
		Index	% Change			Index	% Change			Index	% Change			Index	% Change			Index	% Change		
			Quarter	Annual	Rolling		Quarter	Annual	Rolling		Quarter	Annual	Rolling		Quarter	Annual	Rolling		Quarter	Annual	Rolling
2009	Q1	94.0	-3.8	-10.9	-4.1	94.0	-4.0	-13.7	-6.2	94.3	-1.3	4.5	6.1	95.7	-7.1	-2.5	12.3	89.0	6.0	-10.9	-22.0
	Q2	91.6	-2.6	-13.0	-8.3	90.4	-3.8	-16.7	-11.0	96.5	2.3	3.0	4.9	100.0	4.5	-4.6	5.7	84.5	-5.0	-8.7	-19.5
	Q3	90.3	-1.4	-12.2	-11.0	89.1	-1.4	-15.2	-14.0	95.6	-0.9	-2.5	1.3	99.1	-0.9	-6.6	-0.6	82.7	-2.1	-5.4	-14.6
	Q4	91.4	1.2	-6.5	-10.7	90.3	1.3	-7.8	-13.5	96.0	0.4	0.4	1.3	99.3	0.3	-3.6	-4.3	86.8	4.9	3.3	-5.8
2010	Q1	92.6	1.3	-1.5	-8.5	90.3	0.1	-3.9	-11.2	100.6	4.9	6.7	1.9	102.7	3.4	7.3	-2.1	101.5	17.0	14.1	0.7
	Q2	92.8	0.2	1.4	-4.9	91.1	0.8	0.7	-6.9	102.2	1.6	5.9	2.6	99.9	-2.7	-0.1	-0.9	105.8	4.2	25.2	9.2
	Q3	93.1	0.4	3.2	-1.0	92.0	1.0	3.2	-2.1	103.8	1.6	8.6	5.4	100.6	0.7	1.5	1.2	92.8	-12.3	12.1	13.7
	Q4	96.6	3.7	5.7	2.2	95.2	3.5	5.4	1.3	106.2	2.2	10.6	8.0	103.6	3.1	4.4	3.2	85.9	-7.4	-1.0	12.5
2011	Q1	97.7	1.2	5.5	3.9	97.7	2.6	8.1	4.4	103.0	-3.0	2.4	6.8	95.2	-8.1	-7.3	-0.4	88.0	2.4	-13.3	4.8
	Q2	99.5	1.9	7.2	5.4	98.6	0.9	8.2	6.3	110.8	7.6	8.4	7.5	95.7	0.5	-4.2	-1.5	93.6	6.4	-11.5	-4.4
	Q3	101.8	2.3	9.3	6.9	100.8	2.3	9.6	7.9	112.8	1.8	8.6	7.5	96.4	0.7	-4.1	-2.9	101.5	8.4	9.5	-4.6
	Q4	102.5	0.6	6.1	7.0	101.3	0.5	6.5	8.1	114.2	1.2	7.5	6.8	97.3	1.0	-6.1	-5.4	101.1	-0.5	17.6	-0.5
2012	Q1	101.0	-1.4	3.4	6.5	99.9	-1.4	2.3	6.6	116.6	2.1	13.2	9.4	94.6	-2.8	-0.7	-3.8	103.6	2.5	17.7	7.3
	Q2	99.8	-1.3	0.2	4.7	99.3	-0.6	0.7	4.7	108.0	-7.4	-2.6	6.5	94.5	-0.1	-1.3	-3.1	92.2	-11.0	-1.5	10.6
	Q3	98.1	-1.6	-3.6	1.5	97.4	-1.9	-3.4	1.5	103.0	-4.6	-8.7	2.1	95.6	1.1	-0.9	-2.3	101.9	10.6	0.4	8.1
	Q4	97.1	-1.0	-5.2	-1.3	96.2	-1.3	-5.1	-1.4	102.4	-0.6	-10.3	-2.5	98.5	3.1	1.2	-0.4	105.0	3.0	3.9	4.8
2013	Q1	98.9	1.9	-2.1	-2.7	97.7	1.6	-2.2	-2.5	103.8	1.4	-11.0	-8.2	100.8	2.4	6.6	1.4	102.6	-2.3	-1.0	0.5
	Q2	97.8	-1.1	-2.0	-3.2	98.2	0.5	-1.1	-3.0	95.5	-8.0	-11.5	-10.4	99.2	-1.6	5.0	2.9	102.5	-0.1	11.1	3.4
	Q3	101.4	3.6	3.3	-1.5	101.7	3.6	4.4	-1.0	100.0	4.7	-2.9	-9.1	100.4	1.2	5.0	4.4	97.8	-4.5	-4.0	2.3
	Q4	101.9	0.5	4.9	1.0	102.3	0.6	6.4	1.8	100.6	0.6	-1.7	-7.0	99.6	-0.8	1.1	4.4	97.1	-0.7	-7.5	-0.7

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¹⁷ The change in the rolling annual average measures the change in the average of the latest four quarters against the same four quarters one year previous.

¹⁸ The regional GVA weights relate to 2013.

Table 16 (cont): Index of Production – Quarterly, annual and rolling annual average¹⁹ changes by sector, Northern Ireland

		All Production industries - Sections B, C, D, E (seasonally adjusted)				Manufacturing – Section C (seasonally adjusted) weight ²⁰ = 82.1%				Water, supply & waste management – Section E (seasonally adjusted) weight ¹⁹ = 9.0%				Electricity, gas, steam & air conditioning – Section D (seasonally adjusted) weight ¹⁹ = 7.1%				Mining & quarrying – Section B (seasonally adjusted) weight ¹⁹ = 1.8%			
		Index	% Change			Index	% Change			Index	% Change			Index	% Change			Index	% Change		
			Quarter	Annual	Rolling		Quarter	Annual	Rolling		Quarter	Annual	Rolling		Quarter	Annual	Rolling		Quarter	Annual	Rolling
2014	Q1	101.3	-0.5	2.4	2.1	101.8	-0.5	4.2	3.5	98.2	-2.5	-5.5	-5.5	99.0	-0.6	-1.8	2.3	96.3	-0.8	-6.1	-2.0
	Q2	102.2	0.9	4.5	3.8	103.5	1.7	5.4	5.1	96.9	-1.3	1.4	-2.3	100.2	1.1	0.9	1.3	94.2	-2.2	-8.1	-6.4
	Q3	102.5	0.3	1.1	3.2	103.5	0.0	1.7	4.4	96.2	-0.7	-3.8	-2.5	100.4	0.3	0.1	0.1	96.7	2.6	-1.2	-5.8
	Q4	103.0	0.6	1.1	2.3	104.2	0.7	1.9	3.3	99.4	3.3	-1.2	-2.3	94.7	-5.7	-4.9	-1.4	100.8	4.3	3.8	-3.0
2015	Q1	104.8	1.8	3.5	2.5	106.5	2.2	4.6	3.4	95.7	-3.8	-2.5	-1.6	97.8	3.3	-1.2	-1.3	94.3	-6.4	-2.1	-2.0
	Q2	104.4	-0.5	2.1	1.9	105.9	-0.6	2.3	2.6	99.6	4.1	2.8	-1.2	99.1	1.3	-1.0	-1.8	89.0	-5.6	-5.5	-1.2
	Q3	103.3	-1.0	0.8	1.9	104.4	-1.4	0.8	2.4	100.2	0.6	4.1	0.8	97.1	-2.0	-3.3	-2.6	87.5	-1.7	-9.5	-3.3
	Q4	104.8	1.5	1.7	2.0	106.9	2.4	2.6	2.6	95.7	-4.5	-3.7	0.1	96.9	-0.1	2.4	-0.8	87.1	-0.5	-13.6	-7.8
2016	Q1	104.2	-0.6	-0.6	1.0	106.0	-0.8	-0.5	1.3	96.8	1.1	1.1	1.1	98.0	1.1	0.1	-0.5	90.8	4.3	-3.8	-8.2
	Q2	103.7	-0.5	-0.6	0.3	104.6	-1.4	-1.3	0.4	102.6	6.0	3.0	1.1	98.1	0.1	-1.0	-0.5	99.6	9.8	11.9	-4.2
	Q3	101.8	-1.8	-1.4	-0.2	101.8	-2.6	-2.4	-0.4	103.1	0.5	2.9	0.8	97.6	-0.5	0.5	0.5	106.8	7.2	22.0	3.4

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¹⁹ The change in the rolling annual average measures the change in the average of the latest four quarters against the same four quarters one year previous.

²⁰ The regional GVA weights relate to 2013.

Background

The Northern Ireland Index of Production (IOP) has been produced since 1949 and figures are available in the current format back to 2005. It is published quarterly and is designed to provide a general measure of changes in the output of the production industries in Northern Ireland. (This is defined as Standard Industrial Classification 2007 sections B, C, D and E.) In 2013 these industries accounted for approximately 19% of regional Gross Value Added (GVA). More information on Regional GVA is available at <http://www.ons.gov.uk/economy/grossvalueaddedgva>

Index numbers

An index number is a convenient form of expressing a series in a way that makes it easier to see changes in that series. The numbers in the series are expressed relatively, with one number in that series chosen to be the 'base' (usually expressed as 100) and other numbers being measured relative to that base. Index numbers have the advantage that they allow different types of data to be combined on a consistent basis, e.g. deflated current price data with volume data. The aim of the Index of Production is to provide a reliable indicator of short-term changes in the output of the production sector. Index numbers are a very good way of communicating this message. For example, the Index of Production Quarter 3 2016 value of 101.8 means that the level of output was 1.8% higher than in 2013 which had a base year value of 100. The NI IOP is a Laspeyres volume index. The UK economic accounts are based on the European System of Accounts (ESA), which in turn is based on the UN System of Accounts (SNA). The ESA-preferred type of output indicator is one that measures deflated gross output (or turnover) for an industry. These use an approximate price charge estimator to remove the effects of inflation. For this reason, we and the ONS, use a Laspeyres volume index (as opposed to Paasche, Lowe or Fisher indices). The ONS paper, link following, on the Methodology of the Monthly Index of Services (Annex A: Mathematical Formulation of the Index of Services) gives a good explanation of Index numbers theory. <http://www.ons.gov.uk/ons/guide-method/user-guidance/index-of-services/index-of-services-annex-a--mathematical-formulation-of-the-index.pdf>

Index sample

The IOP sample was refreshed for Quarter 1 2014 and was drawn on a SIC07 basis. The sample was boosted from around 650 businesses and it is now approximately 1,000 companies. Due, in part, to the significant number of companies which fall into the census element, more than 60% of businesses in the new sample were also in the old sample. As a statutory survey the response rate is around 80%. The sample of production industries is selected directly from the Inter Departmental Business Register (IDBR), by stratifying companies by industry and company size. The sample consists of a census of dominant companies and a Neyman stratified random sample of the remaining companies. The census element consists of all companies employing 40 or more employees and those employing 0 to 39 employees and having a turnover of £10 million or more. This sample

has been designed to give sufficiently accurate results, yet keep the total costs to businesses to a minimum.

Questionnaires were issued to both the new and existing businesses on each sample, for three quarters, as a means to calculate a link factor between the old sample (up to and including Quarter 4 2013) and the new sample (from Quarter 1 2014 onwards). With advice from Office for National Statistics methodologists, as the result of a successful Quality Improvement Fund, a methodology has been developed in order to integrate the new samples without making significant changes to the back series data, thus giving a meaningful index.

Data collection, validation and Index calculation

The survey forms are issued quarterly, immediately after the period to which they relate. For example, forms are issued in October asking for information relating to July to September. Companies are asked to provide their turnover and exports. Historically a number of companies provided volume information rather than turnover data (e.g. litres of a product rather than the turnover value of the product). From Quarter 2 2010 these companies were asked to also provide turnover data and from Quarter 2 2011 the IOP estimates have solely been based on turnover. In response to user demand information is also collected on the value of exports. This will be used to produce a quarterly index in due course once a sufficient back series has been established.

From Quarter 1 2016, a Quarterly Business Survey form was issued to all businesses who previously received an Index of Production form and a Quarterly Employment Survey form and companies are now asked to provide employment and turnover information at the same time. This combined survey form, coupled with the roll-out of an 'eForm' (designed to collect data electronically) is intended to reduce the burden to businesses currently receiving two separate forms at different times.

Data validation is carried out ensuring that data fall within the expected limits, contacting the company where appropriate for clarification.

The overall Index of Production is calculated by weighting together industry level indices using relative shares of Accounts Gross Value Added (GVA) data from the most recent Regional Accounts, which is currently 2013. The IOP relative weights used to produce the aggregated industries are derived from the Regional GVA estimate, published annually by ONS. Figures within this publication of IOP are weighted using 2013 GVA which became available on 9th December 2015.

For practically all series, the value of sales deflated to allow for price changes, is used as the indicator. In the remaining cases, changes in the volume of production or the number of employees are used as a proxy measure.

From Quarter 2 2014, the individual series have been seasonally adjusted using X-13 ARIMA SEATS, which introduces improvements to the models used for seasonal adjustment. Also, during the annual seasonal adjustment review in December 2015 (from Quarter 3 2015) the smoothing methodology, applied to companies with particularly volatile returns, has now been removed for the remaining few companies. The main

sectors affected are the water supply, sewerage, and waste management (inc. recycling) and mining and quarrying along with some of the individual manufacturing subsectors.

Further information on the methodology and impact of the seasonal adjustment changes can be found in the methodological note published at <https://www.economy-ni.gov.uk/publications/methodology-and-usage-iop>

It is also possible to aggregate all individual series to give indices by final use of goods produced. This is known as a market sector analysis and estimates are given in Section 5 of this bulletin. It distinguishes between seasonally adjusted consumer, seasonally adjusted investment and seasonally adjusted intermediate Goods. The latter are described as intermediate because they include materials used to produce goods for consumption.

The productivity index provides a measure of the number of units of output produced per person per paid hour. The productivity index is based on the seasonally adjusted manufacturing index, seasonally adjusted employees in employment and average weekly hours (based on hours worked for full-time adult manufacturing workers including overtime from the Annual Survey of Hours and Earnings). An index of total employee hours is calculated based on the number of employees in employment and average weekly hours. The seasonally adjusted index of manufacturing is divided by the index of total employee hours to produce the Index of Productivity.

The seasonally adjusted Northern Ireland Index of Production is annually chain-linked (chain-linking involves the linking of growth estimates between different periods in order to produce a continuous time series) using GVA estimates derived from regional accounts using the fourth quarter of the preceding year as the link period. Inaccuracies caused by the assumption of a stable relationship between GVA and turnover are reduced using this methodology. When annual weights are used the assumption only has to be maintained from one year to the next year. A paper on annual chain-linking from ONS is available at <http://www.ons.gov.uk/ons/rel/regional-accounts/regional-gross-value-added--income-approach-/december-2010/stb-regional-gva-dec-2011.html>

The standard method for linking two series (for example one based on a SIC03 sample and one based on SIC07 sample) is to calculate the index under the old and new circumstances over some link period, and then apply the growth of the subsequent new series to the old series. As the relationship of both samples to the IDBR was known, the IDBR was used to provide the link period. Thus the ratio of the IDBR turnover for Quarter 1 2011 and Quarter 2 2011 is known. We have the Quarter 2 2011 value (SIC07) and the Quarter 1 2011 value (converted from SIC03 to SIC07). We can, therefore, create the following link factor:

$$\text{link factor} = \frac{(\text{Quarter 2 2011 sample estimate} * \text{IDBR Quarter 1 2011 value})}{(\text{Quarter 1 2011 sample estimate} * \text{IDBR Quarter 2 2011 value})}$$

This can then be applied to the converted back series along with historic Quarter 1 to Quarter 2 fluctuations, thus retaining the previous growth rates and any seasonal effects.

For Quarter 1 2014 and Quarter 2 2014, questionnaires were issued to companies in both the existing sample and the new sample, thus allowing a link factor to be calculated based on the average percentage change between the two. This link factor was then applied to each of the quarterly turnover back series (grossed & deflated), in order to give a series of the same magnitude as the new sample series (from Quarter 1 2014 onwards).

Deflation

All series, unless otherwise quoted, are measured at constant market price. Deflators adjust the value series to take out the effect of price change to give the volume series. Details on the changes to the ONS deflators methodology can be found at the following link <http://www.ons.gov.uk/ons/guide-method/method-quality/specific/economy/national-accounts/methodology-and-articles/2011-present/index.html>

Seasonal adjustment

The index numbers in this statistical bulletin are seasonally adjusted, following the annual seasonal adjustment review which was carried out in December 2015. This aids interpretation by removing annually recurring fluctuations, for example due to holidays or other regular seasonal patterns. All IOP time series are checked on an annual basis using X-13 ARIMA SEATS for evidence of seasonality, and those series where seasonality is detected are adjusted using X-13 ARIMA SEATS in order to obtain a clear picture of the general trend. Unadjusted data are also available.

The figures presented in this publication are calculated using the X-13 ARIMA SEATS method of seasonal adjustment. The following is a link to an ONS Guide to seasonal adjustment with X-12 ARIMA (an updated guide for X-13 ARIMA SEATS is currently being finalised by ONS) <http://www.ons.gov.uk/ons/guide-method/method-quality/general-methodology/time-series-analysis/guide-to-seasonal-adjustment.pdf>

Quality reporting

One indicator of the reliability of the figures in this bulletin can be obtained by monitoring the size of revisions. The IOP revisions policy can be found at <https://www.economy-ni.gov.uk/articles/quality-and-revisions-0>

Summary quality report

The latest summary quality report for this publication can be found on the IOP Quality and Revisions page of the website at <https://www.economy-ni.gov.uk/articles/quality-and-revisions-0>

Publication of results on a SIC07 basis

A Standard Industrial Classification (SIC) was first introduced into the UK in 1948 for use in classifying business establishments by the type of economic activity in which they are engaged. The UK is required by European legislation to revise the SIC in parallel with NACE (the statistical classification of economic activities in the European Communities) so that both systems are identical down to and including the four digit class level. More information on SIC07 can be found at the following links: <http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/standard-industrial-classification/index.html>

<http://www.ons.gov.uk/ons/rel/naa2/second-estimate-of-gdp/q2-2011/art---bb11-improvements-to-gdp--ios--iop.html>

Status of figures in current bulletin

Results are published on a SIC07 basis in this bulletin and all indices are produced on a 2013=100 basis.

All figures are published to one decimal place. Figures for annual averages and percentage changes over the previous quarter and year are based on unrounded figures and may not agree with the published constituent parts.

Results, particularly for the latest quarter, are provisional and subject to revision as more up to date information become available.

The overall IOP index has been produced using X-13 ARIMA SEATS seasonal adjustment. Some of the sectors and sub-sectors have also been seasonally adjusted, and those can be identified throughout the bulletin.

Comparisons between the Index of Production and the Annual Business Inquiry (ABI) may not necessarily match because of definitional and coverage differences.

Planned future revisions

The IOP revisions policy can be found at <https://www.economy-ni.gov.uk/articles/quality-and-revisions-0>

Publications policy

All Economic and Labour Market Statistics Branch statistical publications are available to download free of charge from the website <https://www.economy-ni.gov.uk/topics/deti-statistics-and-economic-research>

The IOP bulletin is available at <https://www.economy-ni.gov.uk/topics/statistics-and-economic-research/index-production>

The tables from the current publication, which include data back to 2005, are available in Excel format to download free of charge from the IOP website at <https://www.economy-ni.gov.uk/publications/archive-publications-index-production-iop>

The Economic and Labour Market Statistics Branch statistics publication schedule is available at <https://www.economy-ni.gov.uk/publications/elms-publication-schedule>

The list of people given pre-release access to this publication is available at <https://www.economy-ni.gov.uk/publications/statistical-protocols-and-compliance-pre-release-information>

SIC 2007 definitions

Manufacturing – SIC07 Section C (weight 82.1%)

The boundaries of manufacturing and the other sectors of the classification system can be somewhat blurred. As a general rule, the activities in the manufacturing section involve the transformation of materials into new products. Their output is a new product.

Water supply, sewerage, and waste management (inc. recycling) – SIC07 Section E (weight 9.0%)

This section covers activities related to the management (including collection, treatment and disposal) of various forms of waste, such as solid or non-solid industrial or household waste, as well as contaminated sites. Activities of water supply are also grouped in this section since they are often carried out in connection with, or by units also engaged in, the treatment of sewage.

Electricity, gas, steam and air conditioning supply – SIC07 Section D (weight 7.1%)

This section includes the activity of providing electric power, natural gas, steam, hot water and the like through a permanent infrastructure (network) of lines, mains and pipes. Also included is its distribution in industrial parks or residential buildings. This, therefore, includes the operation of electric and gas utilities.

Mining and quarrying – SIC07 Section B (weight 1.8%)

This section covers the extraction of minerals occurring naturally as solids (coal and ores), liquids (petroleum) or gases (natural gas). Extraction can be achieved by different methods such as underground or surface mining, well operation, seabed mining, etc.

Next publication

The next bulletin will be published on 15th March 2017.

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