Quarterly Index of Industrial Production (QIIP)
Third Quarter 2010

1. Introduction

The Index of Industrial Production shows the evolution of the volume of output of the Industrial Sector which covers "Mining and quarrying", "Manufacturing" and "Electricity, gas and water supply" and accounts for around 21% of Gross Domestic Product (GDP). The index compiled on a quarterly basis is one of the most important industrial short-term indicators, which aims at measuring, on a quarterly basis, the changes in the volume of industrial output.

This issue of "Economic and Social Indicators" presents the quarterly indices for the first quarter of 2008 to third quarter of 2010 with weights based on the results of the 2007 Census of Economic Activities.

The indices are given separately for the three sections, namely, "Mining and quarrying", "Manufacturing" and "Electricity, gas and water supply". Within "Manufacturing", estimates by broad group, namely EOE, Non-EOE and "Sugar milling" as well as by main industrial grouping are given. Wherever possible, the annual averages of the quarterly indices have been worked out and included in the tables. It is to be noted that, due to incomplete data, indices for the third quarter of 2010 are provisional and published at section and broad group level only. They are therefore subject to revision in future issues of the Economic and Social Indicator of QIIP.

The published indices are not seasonally adjusted. The user is therefore advised to base comparisons for a particular quarter of a year on the corresponding quarter of the previous year.
The objectives of the QIIP, data sources and methodology used in the compilation of the index as well as the limitations of the index are given at annex.

2. Changes in compilation practices

The indices are presented using 2007 as the reference year, based on the results of the 2007 Census of Economic Activities (CEA) compared to base year 2002 used previously. The new indices have been calculated using the annual overlap technique resulting in chain linked indices compared to indices based on fixed weights compiled previously according to the UN manual "International Recommendations for the Index of Industrial Production-2009". The weights obtained from the 2007CEA have been adjusted by the amount of Financial Services Indirectly Measured (FISIM) consumed by the different industry groups in the production process.

It is to be noted that indices worked out for the Non-EOE now includes both small and large establishments compared to only large ones previously. Thus the new index series is not strictly comparable with the previous one.

More details are given at Section 10 of the ANNEX

3. The overall index - Industrial Sector

In the third quarter of 2010 the overall index of industrial production decreased by 3.4% compared to the previous quarter, and increased by 4.9% when compared to the corresponding quarter of 2009. In the year ending third quarter 2010, i.e. fourth quarter 2009 to third quarter 2010, real industrial output went up by 8.2% compared to the corresponding

period a year before. This is explained mainly by increases in the real output of "Sugar Milling" (+5.4%), "EOE" (+11.4%), "Non-EOE" (+2.2%) and "Electricity, gas and water supply" (+2.8%) partly offset by a decrease of 2.7% in "Mining and quarrying" (Table 1). The long-term trend (4-quarter moving average), as shown graphically by chart 1, shows that the upward tendency is maintained during the whole period.
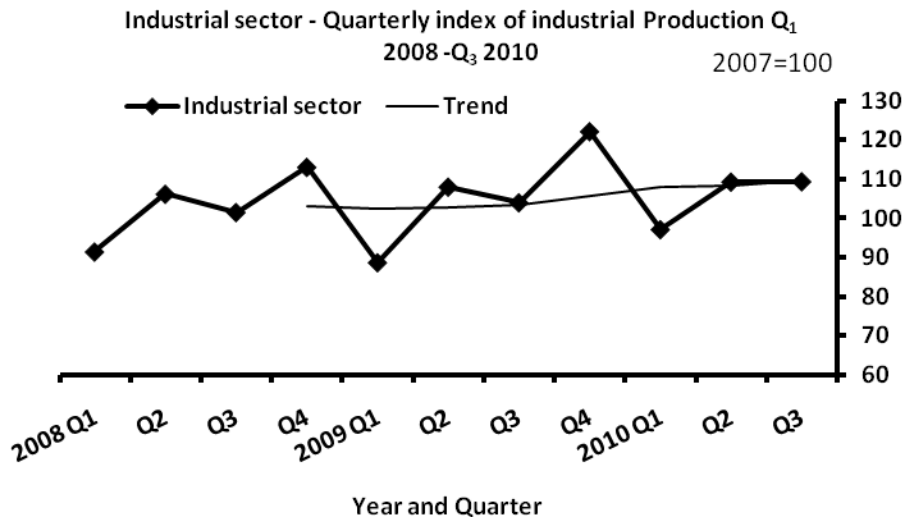
Industrial sector - Quarterly index of industrial Production Q_1 2008 -Q_3 2010   2007=100

Year and Quarter

Chart 1

4. Changes by section

4.1 Mining and quarrying

"Mining and quarrying", is restricted to activities relating to quarrying of decorative stones, sand and salt extraction and represents only 0.2% of the output of the industrial sector. In the third quarter of 2010, real output decreased by 13.2% compared to the previous quarter and increased by 3.0% when compared to the corresponding quarter of 2009. In the year ending third quarter 2010, real output went down by 2.7% (Table 1).

Mining and Quarrying - Quarterly index of industrial Production, Q_1 2008 - Q_3 2010   2007=100
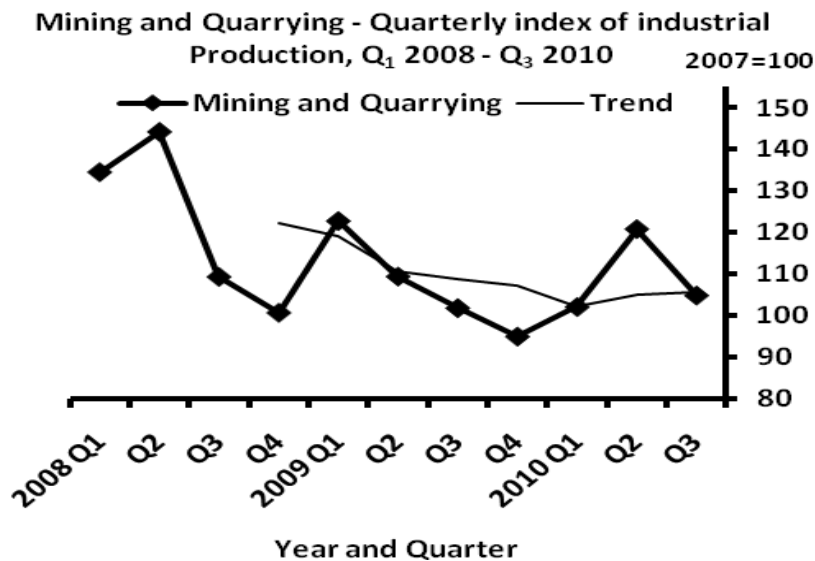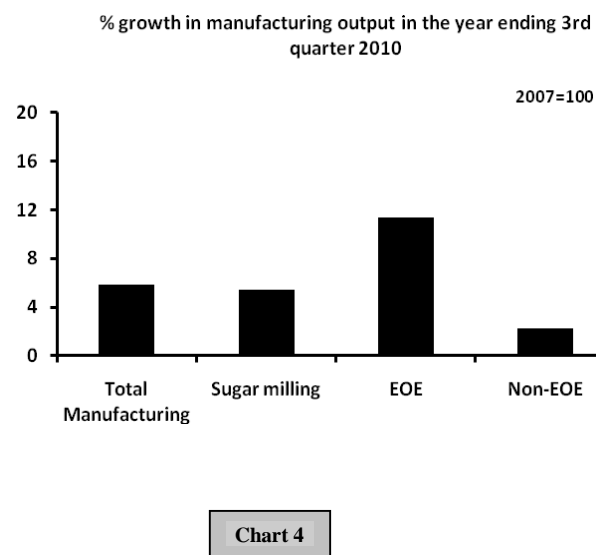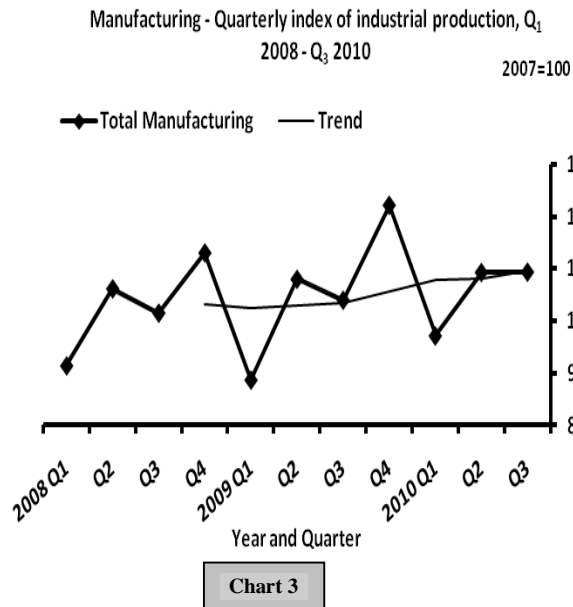

Year and Quarter

Chart 2

4.2 Manufacturing

Manufacturing output, which covers the production of a wide range of goods, represents 92% of the output of the industrial sector. For analysis purposes, "Manufacturing" is broken down into the following broad groups:

- Sugar milling representing around 3% of manufacturing output
- EOE (43%)
- Non–EOE (54%)

Manufacturing - Quarterly index of industrial production, Q_1 2008 - Q_3 2010

2007=100

-◆-Total Manufacturing ⸻Trend

Chart 3

% growth in manufacturing output in the year ending 3rd quarter 2010

2007=100

Chart 4

Manufacturing output in the third quarter of 2010 increased by 0.1% compared to the previous quarter, and increased 5.2 % when compared to the corresponding quarter of 2009 (Table1). In the year ending third quarter 2010, real output went up by 5.8%. This is explained by increases of 5.4%, 11.4% and 2.2% in "Sugar Milling", "EOE" and "Non-EOE" respectively. The performances of the EOE and the Non-EOE excluding "Sugar milling" by detailed industry group up to second quarter 2010 are analysed separately in Section 5. As mentioned in the introduction, due to incomplete data, indices for the third quarter of 2010 are provisional and published at section and broad group level only.

4.3 Electricity, gas and water supply

"Electricity, gas and water supply" accounts for around 7.4% of the output of the industrial sector. In the third quarter of 2010, real output of this sector decreased by 28.6% when compared to the previous quarter and went up by 3.7% when compared to the corresponding quarter of 2009. In the year ending third quarter 2010, it is estimated to have moved up by 2.8% (Table 1).

Electricity, gas and water supply - Quarterly index of industrial production, Q₁ 2008 - Q₃ 2010
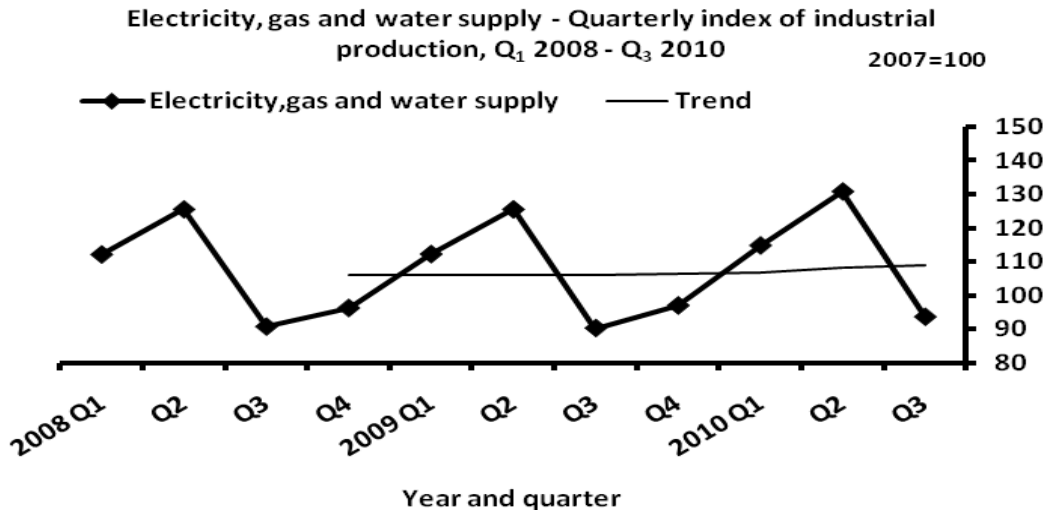
2007=100

Year and quarter

Chart 5

5. Changes by broad group

5.1 EOE

Real output of the EOE increased by 3.7% in the third quarter of 2010 compared to the second quarter of 2010 and increased by 17.1% when compared to the corresponding quarter of 2009. In the year ending third quarter 2010, output in the EOE went up by 11.4% (Table1).

Indices by main industrial grouping for the third quarter of 2010 are not available. However, an indication of the annual performance at this level can be obtained by comparing the detailed quarterly indices available for year ending second quarter of 2010 to those for year ending second quarter 2009 (Table 3). Real output of "Wearing apparel", the most important industrial grouping within the EOE, decreased by 4.7% and that of "Textiles" went down by 2.9%. These two sub-groups account for 75.6% of the total weight allocated to the EOE. The production of "Food products", "Chemicals and man-made fibres" and "Jewellery" increased by 16.8%, 114.8% and 79.8% respectively, whereas that of "Optical instruments, watches and clocks" receded by 19.2%. A positive growth of 14.3% in the production of "Other manufacturing" has also been noted. Details of changes at sub-group level are shown in Chart 7.
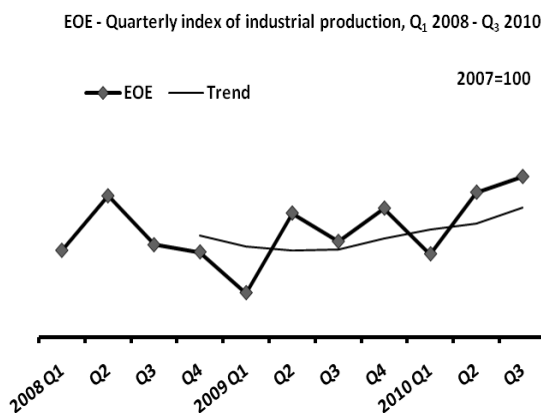

EOE - Quarterly index of industrial production, Q₁ 2008 - Q₃ 2010

2007=100

Chart 6

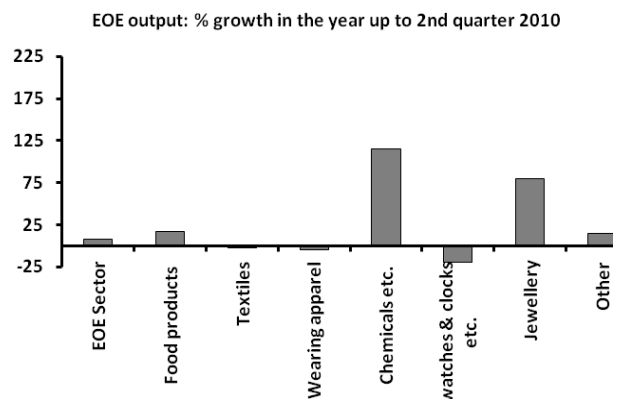EOE output: % growth in the year up to 2nd quarter 2010

Chart 7

5.2 Non-EOE excluding "Sugar milling"

The index for the Non-EOE refers to large and small establishments (see methodology at annex). Provisional estimate of the real output of Non-EOE establishments shows a decrease of 2.2% in the third quarter of 2010 compared to the previous quarter and of 1.4% compared to the corresponding quarter of 2009. In the year ending third quarter 2010, the index went up by 2.2% (Table 1).

An indication of the annual performance at sub-group level is obtained by comparing the detailed quarterly indices available for year ending second quarter 2010 to those for year ending second quarter 2009 (Table 4). Decreases were registered in "Food products excluding sugar" (-4.0%), "Chemicals and man-made fibres" (-50.3) and "Other manufacturing" (-0.8%). Increases were noted in "Beverages" (+0.6%), "Textiles" (+10.6%), "Wearing Apparel" (4.8%), "Publishing and printing" (+9.7%), "Non-metallic mineral products" (+3.0%), "Basic metals and metal products" (+5.5%) and "Furniture" (+17.7%) as illustrated in chart 9.

Non EOE excl. "sugar milling" - Quarterly index of industrial production, Q$_1$ 2008 - Q$_3$ 2010

Chart 8

Non-EOE output: % growth in the year up to 2nd quarter 2010

Chart 9

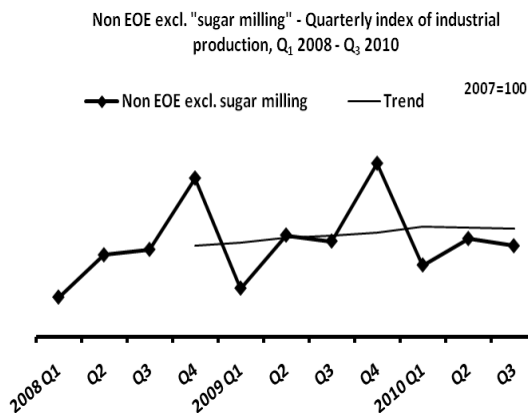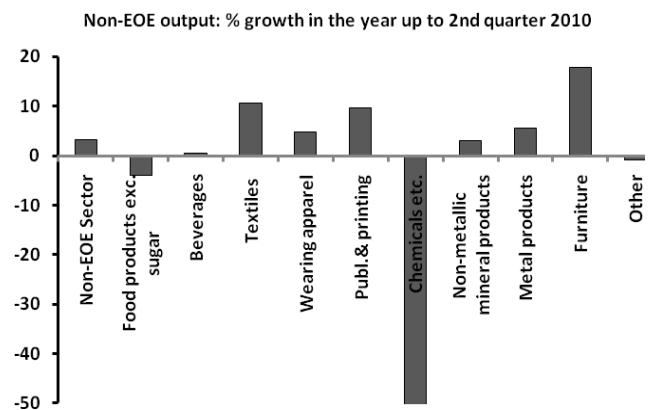**Central Statistics Office**
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Table 1: Index of industrial production by section - annual and quarterly indices, Q₁ 2008 to Q₃ 2010   **Year 2007 = 100**

| | Industrial sector | Mining and quarrying | Manufacturing | | | | | | Electricity, gas and water supply |
			Total	Total exc. sugar milling	Sugar milling [1]	EOE	Non-EOE	
NSIC Rev. 3	10 - 37, 40, 41	10 - 14	15 - 37	15-37 exc. 1542	1542	15 - 37	15 - 37	40, 41
Weight	1000	2	924	898	26	397	501	74
Annual								
2008	100.3	107.6	103.1	103.1	103.5	101.7	104.2	106.1
2009	100.4	100.9	105.8	106.0	118.9	100.8	108.4	106.2
Quarterly								
2008 Q1	93.1	134.5	91.5	92.1	72.7	97.8	87.5	112.1
Q2	107.7	144.2	106.2	106.0	114.4	112.2	101.1	125.6
Q3	100.8	109.4	101.6	101.2	114.0	99.3	102.8	90.6
Q4	111.8	100.8	113.1	113.1	112.8	97.4	125.6	96.1
2009 Q1	81.0	122.8	88.8	88.9	83.5	86.6	90.4	112.2
Q2	109.6	109.5	108.1	120.9	131.5	107.6	107.4	125.5
Q3	102.8	101.9	104.1	96.2	131.0	100.2	105.4	90.1
Q4	119.9	95.1	122.2	118.0	129.7	109.0	130.3	96.9
2010 Q1	99.0	102.2	97.2	97.5	85.5	96.9	97.8	114.8
Q2	111.6	120.9	109.4	111.7	134.5	113.2	106.3	130.9
Q3	107.8	104.9	109.4	100.1	134.0	117.3	103.9	93.5
% change, latest quarter over: [1]								
previous quarter	-3.4	-13.2	0.1	-10.4	-0.4	3.7	-2.2	-28.6
same quarter a year ago	4.9	3.0	5.2	4.0	2.3	17.1	-1.4	3.7
% growth in output in the year ending: [1]								
3rd quarter 2010	8.2	-2.7	5.8	1.9	5.4	11.4	2.2	2.8

[1] provisional

Table 2: Index of industrial production by main industrial grouping - manufacturing, Q$_1$ 2008 to Q$_2$2010   **Year 2007 = 100**

		Main industrial grouping								
	Total manufacturing	Food products inc. sugar	Beverages	Textiles	Wearing apparel	Publishing and printing	Chemicals and man-made fibres	Non-metallic mineral products	Basic metals and metal products	Other
NSIC Rev. 3	15 - 37	151 - 154	155	17	18	22	23 - 25	26	27, 28	19 - 21, 29 - 37
Weight	1000	213	111	59	296	42	60	43	49	127
Annual										
2008	103.1	108.6	104.5	93.3	101.5	106.2	109.3	97.1	101.4	99.7
2009	105.8	116.6	104.1	72.0	105.6	112.1	106.3	89.9	101.3	107.2
Quarterly										
2008 Q1	91.5	92.9	88.3	93.3	95.0	88.1	94.9	83.6	84.1	88.0
Q2	106.2	103.5	96.8	110.8	110.2	104.8	108.8	104.8	109.5	106.1
Q3	101.6	118.2	96.2	85.2	95.1	98.7	108.0	94.3	105.0	100.3
Q4	113.1	119.9	136.5	83.8	105.6	133.1	125.6	105.9	106.9	104.5
2009 Q1	88.8	91.2	90.7	66.8	100.4	94.6	86.5	69.2	86.6	77.0
Q2	108.1	124.6	94.6	72.3	110.5	109.5	98.9	99.9	100.0	110.7
Q3	104.1	120.9	91.4	69.8	87.9	112.4	105.3	90.7	102.4	114.4
Q4	122.2	129.6	139.7	79.1	116.4	132.0	134.6	99.6	116.2	127.2
2010 Q1	97.2	107.5	90.5	66.2	92.1	117.6	113.9	82.5	96.9	92.6
Q2	109.4	126.7	102.8	90.0	92.5	126.2	128.8	107.6	105.2	107.5
% change, latest quarter over:										
previous quarter	12.5	17.8	13.5	35.9	0.4	7.4	13.0	30.4	8.5	16.1
same quarter a year ago	1.2	1.6	8.6	24.4	-16.3	15.2	30.2	7.7	5.1	-2.9
% growth in output in the year ending:										
2nd Quarter 2010	5.2	6.8	1.5	-1.0	-5.5	12.0	15.2	3.0	5.6	12.5

Table 3: Index of industrial production by main industrial grouping - EOE, Q$_1$ 2008 to Q2 2010

Year 2007 = 100

		Main industrial grouping						
	EOE, manufacturing	Food products	Textiles	Wearing apparel	Chemicals and man-made fibres	Optical instruments, watches & clocks	Jewellery	Other
NSIC Rev. 3	15 - 37	151 - 154	17	18	23 - 25	33	3691	19 - 22, 26 - 32, 34, 35,36 (Excl. 3691), 37
Weight	1000	133	118	637	16	18	25	52
Annual								
2008	101.7	107.5	93.4	101.4	127.3	122.0	111.2	89.3
2009	100.8	118.3	71.1	101.3	56.4	75.7	138.5	72.2
Quarterly								
2008 Q1	97.8	98.9	93.4	96.8	163.9	111.7	91.2	94.7
Q2	112.2	107.5	113.5	112.5	150.9	136.2	120.3	94.4
Q3	99.3	125.7	85.1	96.0	87.3	114.7	129.8	87.7
Q4	97.4	97.8	81.5	100.4	107.0	125.3	103.5	80.3
2009 Q1	86.6	76.9	67.3	96.8	108.2	75.8	61.0	61.5
Q2	107.6	138.0	73.5	111.9	94.7	94.4	80.0	68.4
Q3	100.2	129.8	69.7	95.9	169.0	57.8	182.0	67.6
Q4	109.0	128.5	73.8	100.7	176.3	74.8	231.2	91.3
2010 Q1	96.9	94.9	63.9	93.9	249.4	81.4	128.9	69.2
Q2	113.2	158.9	91.0	95.4	258.5	117.7	131.0	112.3
% change, latest quarter over:								
previous quarter	16.8	67.4	42.5	1.6	3.6	44.6	1.6	62.4
same quarter a year ago	5.1	15.1	23.9	-14.7	172.9	24.7	63.7	64.1
% growth in output in the year ending:								
2nd Quarter 2010	7.2	16.8	-2.9	-4.7	114.8	-19.2	79.8	14.3

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Table 4: Index of industrial production by main industrial grouping - Non-EOE (exc. Sugar), Q_1 2008 to Q_2 2010

Year 2007 = 100

	Non-EOE, manufacturing	Food products exc. sugar	Beverages	Textiles	Wearing apparel	Publishing and printing	Chemicals and man-made fibres; Rubber & plastic Products	Non-metallic mineral products	Basic metals and metal products	Furniture	Other
NSIC Rev. 3	15-37	151-154	155,160	17	18	22	24 & 25	26	27, 28	361	19 - 21, 29 - 37
Weight	1000	235	205	14	41	70	99	80	82	85	91
Annual											
2008	104.2	110.2	104.4	92.8	102.4	109.9	274.2	97.1	117.5	92.2	102.5
2009	108.4	99.6	103.7	77.9	152.5	116.6	98.3	89.9	120.8	102.3	118.1
Quarterly											
2008 Q1	87.5	94.7	88.4	92.7	72.6	83.9	220.8	83.6	97.2	86.6	84.0
Q2	101.1	99.3	96.8	93.5	82.3	112.4	265.1	104.8	126.8	95.8	106.4
Q3	102.8	115.8	96.2	86.0	84.0	104.5	283.2	94.3	120.7	87.4	104.9
Q4	125.6	131.4	136.2	98.8	170.8	138.7	327.7	105.9	125.1	98.8	114.8
2009 Q1	90.4	84.9	90.5	63.9	140.3	99.4	83.8	69.2	102.2	86.5	77.4
Q2	107.4	101.7	94.3	65.1	99.8	115.5	98.5	99.9	118.2	90.9	145.9
Q3	105.4	99.6	91.2	69.8	114.5	118.7	97.1	90.7	122.6	112.1	120.5
Q4	130.3	112.1	138.9	112.8	255.4	133.0	113.8	99.6	140.1	121.0	128.6
2010 Q1	97.8	102.2	90.0	81.5	78.6	121.0	83.8	82.5	111.2	97.0	82.9
Q2	106.3	102.7	99.6	82.9	70.1	129.8	99.9	107.6	118.1	98.1	107.5
% change, latest quarter over:											
previous quarter	8.6	0.5	10.7	1.7	-10.7	7.3	19.2	30.4	6.2	1.2	29.6
same quarter a year ago	-1.0	1.0	5.7	27.3	-29.7	12.5	1.4	7.7	-0.1	8.0	-26.3
% growth in output in the year ending :											
2nd quarter 2010	3.2	-4.0	0.6	10.6	4.8	9.7	-50.3	3.0	5.5	17.7	-0.8

ANNEX

Quarterly Index of Industrial Production (QIIP) - Methodology

1   Introduction

The Index of Industrial Production shows the movement of the volume of output of the Industrial Sector. This index was calculated annually and published in the Digest of Industrial Statistics. Following the needs expressed by various institutions, both public and private, the Central Statistics Office decided to compile and disseminate the index on a quarterly basis. The compilation and dissemination of the Quarterly Index of Industrial Production is also one of the requirements of the **I**nternational **M**onetary **F**und (**IMF**) towards graduation to the **S**pecial **D**ata **D**issemination **S**tandard (**SDDS**)**.**

2   Objectives

The **Q**uarterly **I**ndex of **I**ndustrial **P**roduction (**QIIP**) is one of the most important industrial short-term indicators which aim at measuring, on a quarterly basis, the ups and downs of the volume of industrial output with a special focus on detecting, as early as possible, the turning points of the business cycle. This enables planners, decision makers and the business community at large to be aware of any sign of change in the progress of the economy in order to take appropriate and timely policy measures.

At the office level, the index based on "hard" data, provides useful and reliable inputs for the improvement of the annual production estimates and forecasts as well as estimates of quarterly value added for the Industrial Sector.

3   Concept/Definition

The basic concept of the Index of Industrial Production is the measurement of the change in real value added at basic prices. Given that value added is defined as the difference between output and input, the compilation of the index, on a quarterly basis, is faced with practical difficulties in obtaining the data required on inputs and outputs within a reasonable period. In the absence of detailed data for most of the different industrial groups, an approximation of the index is based on change in deflated turnover, physical output or other indicators of change in real value added generated by industrial enterprises. The indicators used by main industrial grouping/sector are as follows:

Sector/Industrial grouping	Indicators used
Mining and quarrying	Value added deflated by appropriate deflators
Industry groups within manufacturing (excluding sugar milling)	Use of proxy indicators i. Volume of production ii. Employment iii. Turnover data deflated by appropriate deflators (for most of the industry groups) iv. Consumption of raw materials

Sector/Industrial grouping	Indicators used
Sugar milling	Value added deflated using the double deflation method. However, until final data are obtained quarterly changes are based on proportions of the deflated annual estimate/forecast. The proportions are computed from the latest quarterly cost structure of milling activities (see sections 7 and 8).
Electricity, gas and water supply	Volume of sales as proxy indicator.

The deflators used are the following price indices at detailed level, wherever possible:
  i. Producer Price Index (PPI)
  ii. Export Price Index (EPI)
  iii. Consumers Price Index (CPI)
  iv. Import Price Index (IPI)
  v. Wage Rate Index (WRI)

4 Scope/Classification

The Quarterly Index of Industrial Production covers the Industrial Sector, which comprises:

   Mining and quarrying (NSIC Section C),

   Manufacturing (NSIC Section D), and

   Electricity, Gas and Water Supply (NSIC Section E)

The activity classification used is the National Standard Industrial Classification of Economic Activities (NSIC) which is compatible to ISIC Rev. 3 recommended by the United Nations. As regards Manufacturing, the index is compiled separately for the EOE and Non-EOE sectors. Non EOE sectors now comprises small and large establishments, while previous series covered only large establishments. Therefore the new series is not strictly comparable with those compiled previously. Output of small manufacturing establishments accounts for around 25% of total Non-EOE output.

5 Compilation practices

The weights have been derived (separately for EOE and Non-EOE within the manufacturing sector) from value added at basic prices by detailed industry group (mostly at 5-digit level of activity classification) compiled from the 2007 Census of Economic Activities. A representative sample has been selected from the CEA 2007 data which covers the whole manufacturing sector. The VAT turnover for the selected establishments is used to derive the index. The index is calculated for each of the lowest level of activity classification and aggregation to the broader level is done as a weighted arithmetic average of the lowest level indices. Under the new methodology the weights will be revised every year.

6 Data sources

As mentioned previously, use is extensively made of proxy indicators for the calculation of the index and one such indicator is deflated turnover data. Turnover data are mainly obtained

from the VAT (Value Added Tax) Department, which is a very important source of secondary data. The sources of data by industry are as follows:

Sector/Industrial grouping	Data sources
Mining and quarrying	• Survey of establishments • Deflators used: CPI
Industry groups within manufacturing (excluding sugar milling)	• Turnover data from VAT Department • Trade statistics • Quarterly Stock Survey • Quarterly Survey of Employment among EOE • Sales of excisable goods from the Mauritius Revenue Authority • Continuous Multipurpose Household Survey • Building permits statistics • Deflators used: PPI, EPI and IPI
Sugar milling	• Survey of establishments • Deflators used: PPI and CPI
Electricity, gas and water supply	Returns from CEB, CWA and Independent Power Producers (IPPs)

7   Problems/Constraints/Data quality

The practical difficulties in compiling an ideal index showing the evolution of value added at constant prices lead to the use of a number of approximation methods which are listed at section 3. Each of the methods has a number of constraints, the main ones being:

Deflated turnover:

- quality of data from VAT Department. The data refer to a mix of formal "large" responding enterprises/establishments. The output of secondary activities of an enterprise are included in turnover data corresponding to the main activity of the enterprise;

- time-lag between production and sales may lead to a late identification of a turning point in the business cycle;

- ignorance of changes in stocks gives a false picture of true production. However, based on available information from the Quarterly Stock Survey, adjustments are made, wherever possible, to take account of changes in stocks;

- the quality of the index is subject to the precision and relevance of the different price indices used for deflation.

- assumption based on a fixed ratio of value added to gross output when, in fact, the ratio may change as a result of technological changes, productivity changes as well as seasonal variation in the production structure

Consumption of raw materials:
- involves the assumption that output is constant per unit of materials used.

Employment:
- does not take account of changes in labour productivity. Although, in the short term, it is reasonable to assume that labour productivity is relatively constant, this is not true in the long term;

Volume of production:
- does not take account of quality changes

Indirect Indicators
- Indirect indicators such as household consumption and building permits have been used to estimate volume changes for certain activities of small establishments. The volume changes may be revised when more appropriate data sources are obtained or the next Census of Economic Activities is carried out.

8   Appropriateness of the QIIP

In spite of the above constraints/weaknesses, it is observed that the index shows relative consistency and is of reliable quality for the measurement of quarterly and other changes. However, great care should be taken when interpreting small changes that may be insignificant at the more detailed level.

9   Index calculation

The QIIP is calculated according to a modified Laspeyre's index and the formula is:

$$I_t = \frac{\sum W_i (Q_{it}/Q_{io})}{\sum W_i} \ X \ 100$$

with I_t = index for quarter t
W_i = weight for activity i

(Q_{it}/Q_{io}) = is the growth in real value added of activity i in quarter t relative to the base year as estimated by an appropriate proxy indicator

10. Main changes from the index compiled previously

a. Indices were calculated for Manufacturing, Electricity, gas and water supply and Mining and Quarrying. Within Manufacturing sub indices were compiled for Sugar milling, EPZ and Non EPZ (large establishments only). Now indices will still be calculated for the same industry groups except that the coverage of Non EPZ will be increased to include small establishments as well. Export Oriented Enterprises consist of all enterprises, previously operating with an EPZ certificate, and those enterprises manufacturing goods for exports and holding a registration certificate issued by the Board of Investment. Indices for EOE sector can be considered as being the same as for EPZ since the latter constitutes more than 95% of EOE. Thus appellations of EPZ and Non EPZ have been changed to EOE and Non EOE respectively.

b. A fixed base Laspeyre's index system was used and the weight was from the 2002CEA. Now a chain base index is compiled using the Annual Overlap technique to derive the index based on previous year weights. In this method the weight is

updated every year and indices are first compiled based on the change in a given quarter compared to the previous year, then the indices are chain linked to produce a series with the same reference year. Thus in the formula given at 9 above the weights will refer to previous year weights.