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economic statistics

## **QUARTERLY UNIT LABOUR COST INDEX BY INDUSTRY**

Singapore Department of Statistics  
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Please direct enquiries on this information paper to:

Sectoral Accounts  
Singapore Department of Statistics  
Tel : 6332 8642  
Email : Wang\_Zhicong@singstat.gov.sg

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# QUARTERLY UNIT LABOUR COST INDEX BY INDUSTRY

## HIGHLIGHTS

1. The Singapore Department of Statistics (DOS) has successfully developed and compiled the quarterly Unit Labour Cost (ULC) index by broad industry<sup>1</sup> from the reference quarter Q1 1980 as shown in the table below.

<b>Overall Economy</b>
<i>Goods Producing Industries</i>
Manufacturing
Construction
Utilities
Other Goods Industries
<i>Services Producing Industries</i>
Wholesale & Retail Trade
Transportation & Storage
Accommodation & Food Services
Information & Communications
Finance & Insurance
Business Services
Other Services Industries

2. Methodological and conceptual improvements which were made to the ULC index include the development of industry-specific quarterly proxy indicators on Compensation of Employees (CoE) and the inclusion of labour income of the self-employed in Total Labour Cost (TLC).

3. ULC for the overall economy grew at a compound annual growth rate (CAGR) of 2.4 per cent from 2010 to 2015. This was mainly due to the growth in ULC of the goods producing industries (CAGR of 4.1 per cent), which was higher than the ULC growth of the services producing industries (CAGR of 1.7 per cent).

<sup>1</sup> Presently, the ULC index is available only for the manufacturing industry and the overall economy.

# QUARTERLY UNIT LABOUR COST INDEX BY INDUSTRY

## I. INTRODUCTION

1. DOS has successfully developed and compiled the quarterly ULC index by broad industry from the reference quarter Q1 1980. Presently, the ULC index is available for the manufacturing industry and the overall economy. Methodological and conceptual improvements have also been incorporated into the quarterly ULC by broad industry.

2. This paper is structured as follows: Section II explains the concepts and definitions relating to the ULC. Section III discusses the key methodological and conceptual improvements made to the ULC estimates and assesses their impact on the manufacturing ULC and the overall economy ULC. Section IV presents an analysis of the ULC trends in recent years. The new data series on the quarterly ULC index by broad industry are available in the Appendix (Table A.1).

## II. CONCEPTS AND DEFINITIONS

3. ULC is defined as the average cost of labour per unit of output and is computed as Total Labour Cost (TLC) per unit of real Gross Value Added (GVA). TLC consists of Compensation of Employees<sup>1</sup> (CoE), labour income of the self-employed, other labour related costs (e.g. Foreign Worker Levy and net training costs) incurred by the employers and wage subsidies (e.g. Wage Credit Scheme<sup>2</sup> and Jobs Credit Scheme<sup>3</sup>) that are provided to the employers. Wage subsidies reduce labour cost to the employers, and are netted off from TLC. An overview of the conceptual framework of ULC is shown in Diagram 1.

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<sup>1</sup> Compensation of Employees (CoE) is a national accounting concept. It measures the income employers paid to employees for their services rendered. The United Nation's System of National Accounts (SNA) defines CoE as total remuneration, in cash or in kind, payable by an enterprise to an employee in return for work done in the period. More details are available at:

<https://www.singstat.gov.sg/-/media/files/publications/economy/ssnsep09-pg13-16.pdf>

<sup>2</sup> Details on the Wage Credit Scheme are available at:

[https://www.iras.gov.sg/IRASHome/Schemes/Businesses/Wage-Credit-Scheme--WCS-/](https://www.iras.gov.sg/IRASHome/Schemes/Businesses/Wage-Credit-Scheme--WCS/)

<sup>3</sup> Details on the Jobs Credit Scheme are available at:

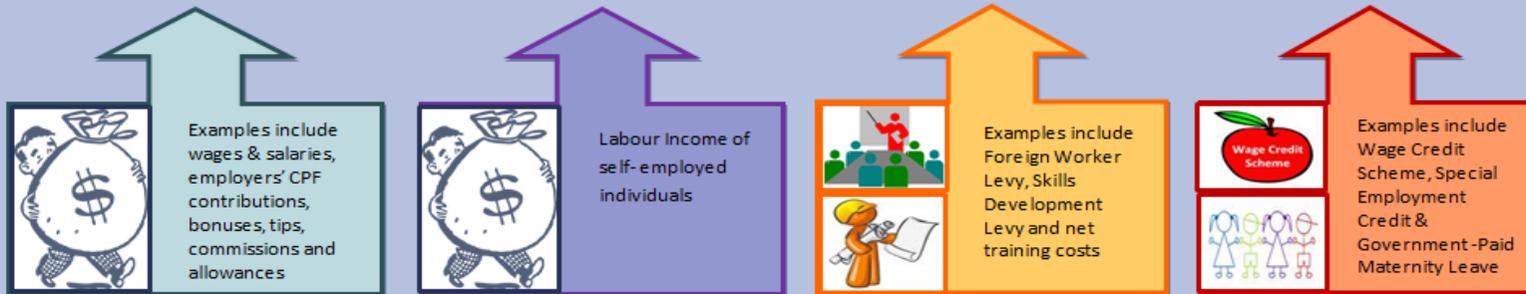
<https://www.iras.gov.sg/irashome/News-and-Events/Newsroom/Media-Releases-and-Speeches/Media-Releases/2009/Jobs-Credit-Scheme-and-Budget-2009-Tax-Rebates/>

Diagram 1: Overview of the ULC

## CONCEPTUAL FRAMEWORK OF UNIT LABOUR COST (ULC)

- ULC measures the average labour cost per unit of real output.

Compensation of Employees + 
 Labour Income of Self-Employed + 
 Other Labour Related Costs - 
 Wage Subsidies



$$\text{ULC by Industry} = \frac{\text{TOTAL LABOUR COST}}{\text{REAL GVA AT BASIC PRICES}}$$



Basic prices refer to the revenue per unit of product sold that 'remains in the hands' of the producer. Taxes on products (e.g. GST) are excluded as these amounts are collected on behalf of the government. On a similar basis, subsidies received on products are included in basic prices.

Real Gross Value Added (GVA) at Basic Prices refers to gross product at basic prices which have been adjusted to exclude the effects of price changes from period to period (i.e. constant prices as at base year).

### III. METHODOLOGICAL AND CONCEPTUAL IMPROVEMENTS

4. Table 1 summarises the methodological and conceptual improvements made to the ULC index.

Table 1: Methodological and Conceptual Improvements to the ULC index

S/N	Issue	Previous Approach	Revised Approach
1)	Availability of Index	The ULC index was available only for the overall economy and manufacturing industry.	The ULC index is available for the overall economy and broad industries, including manufacturing.
2)	Quarterly Compilation Approach	The ULC index for the overall economy was compiled from a top-down approach <sup>4</sup> , i.e. at the overall economy level.	The ULC index for the overall economy is compiled from a bottom-up approach <sup>5</sup> , i.e. aggregating components of ULC at broad industry levels to derive the overall economy level.  Development of industry-specific quarterly proxy indicators on CoE for all broad industries.
3)	Labour Income of the Self-Employed	Excluded	Included <sup>6</sup>

5. The revisions to the annual overall economy ULC and the manufacturing ULC arising from the methodological and conceptual improvements are minimal. For the annual overall economy ULC, the underlying growth for 2010 to 2015 has been revised by between -0.5 and 0.1 percentage points (Table 2). For the manufacturing ULC, the underlying growth has been revised by between -0.2 and 0.3 percentage points.

<sup>4</sup> Quarterly estimates were benchmarked using the pro-rata method. Details on pro-rata benchmarking are available in the International Monetary Fund (IMF) paper: <http://www.imf.org/external/pubs/ft/qna/2000/textbook/ch6.pdf>

<sup>5</sup> Quarterly estimates are benchmarked using the proportional Denton method. Details on proportional Denton benchmarking are available in the IMF paper (refer to the above link).

<sup>6</sup> Labour income of the self-employed by industry is estimated by applying the industry's factor income shares (i.e. share of CoE to Gross Operating Surplus, GOS) to the mixed income of the self-employed individuals. Details on the methodology for labour income of the self-employed are available in the UK's Office of National Statistics (ONS) paper: <http://webarchive.nationalarchives.gov.uk/20130903221738/http://www.ons.gov.uk/ons/rel/icp/productivity-measures/revised-methodology-for-unit-wage-costs-and-unit-labour-costs--explanation-and-impact/explanation-and-impact.html>

Table 2: Revisions to the Existing ULC index, 2010 – 2015

	Overall Economy			Manufacturing Industry		
	Previous (%)	Revised (%)	Revision (% points)	Previous (%)	Revised (%)	Revision (% points)
	(a)	(b)	(b)-(a)	(a)	(b)	(b)-(a)
<b>2010</b>	-3.3	-3.8	<b>-0.5</b>	-15.8	-15.5	<b>0.3</b>
<b>2011</b>	1.7	1.6	<b>-0.1</b>	-2.2	-2.1	<b>0.1</b>
<b>2012</b>	2.9	3.0	<b>0.1</b>	2.8	2.9	<b>0.1</b>
<b>2013</b>	1.4	1.4	<b>0.0</b>	3.3	3.4	<b>0.1</b>
<b>2014</b>	3.3	3.2	<b>-0.1</b>	2.5	2.3	<b>-0.2</b>
<b>2015</b>	2.8	2.8	<b>0.0</b>	6.3	6.3	<b>0.0</b>

#### IV. ANALYSIS

##### TLC Moves in Tandem with CoE

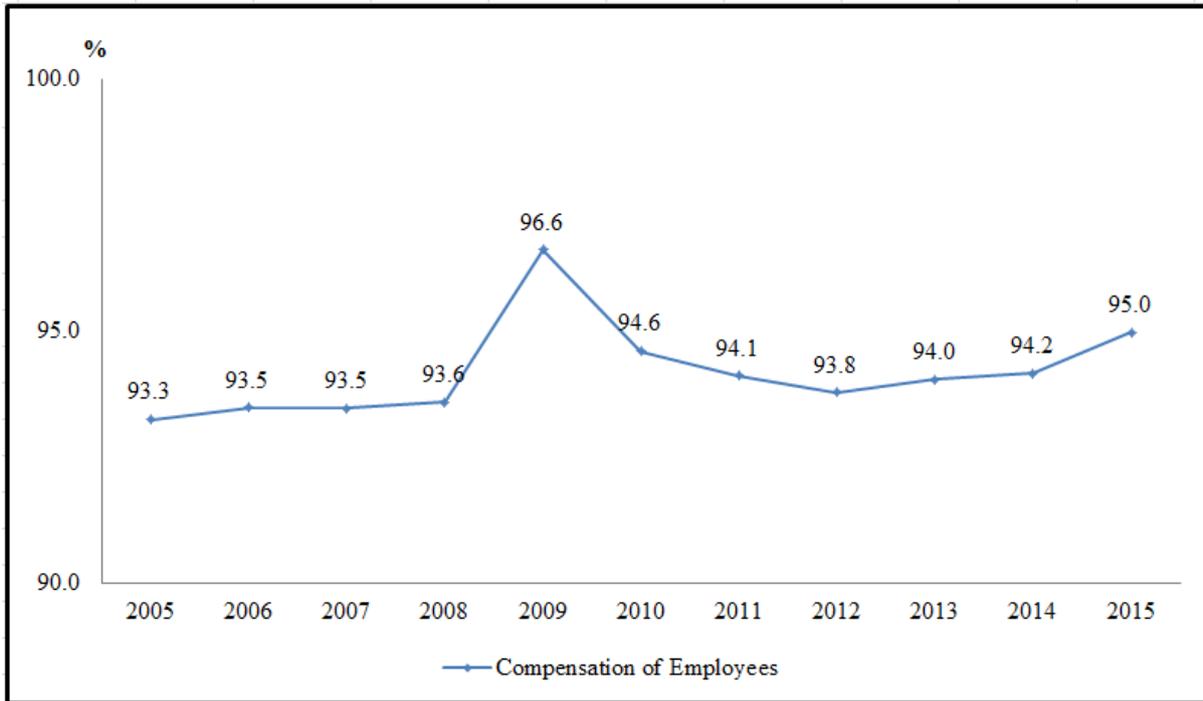
6. Except for 2009, CoE averaged about 94 per cent of TLC at the overall economy level over the 2005 to 2015 period (Chart 1). The introduction of the Jobs Credit Scheme during the Global Financial Crisis in 2009, for example, lowered the TLC and resulted in a relatively higher share of CoE in TLC for that year. Despite the introduction of the Special Employment Credit<sup>7</sup>, the share of CoE in TLC dipped marginally to about 94 per cent in 2012. This was caused primarily by an upward revision to the Foreign Worker Levy rates<sup>8</sup>. The introduction of the Wage Credit Scheme in 2013 and Temporary Employment Credit<sup>9</sup> in 2015 have similarly lowered TLC and resulted in a slightly higher CoE share in TLC in recent years.

<sup>7</sup> Details on the Special Employment Credit are available at: <https://www.sec.gov.sg/>

<sup>8</sup> Details on the Ministry of Manpower's revision to the Foreign Worker Levy rates are available at: <http://www.mom.gov.sg/newsroom/press-releases/2011/foreign-worker-levy-changes>

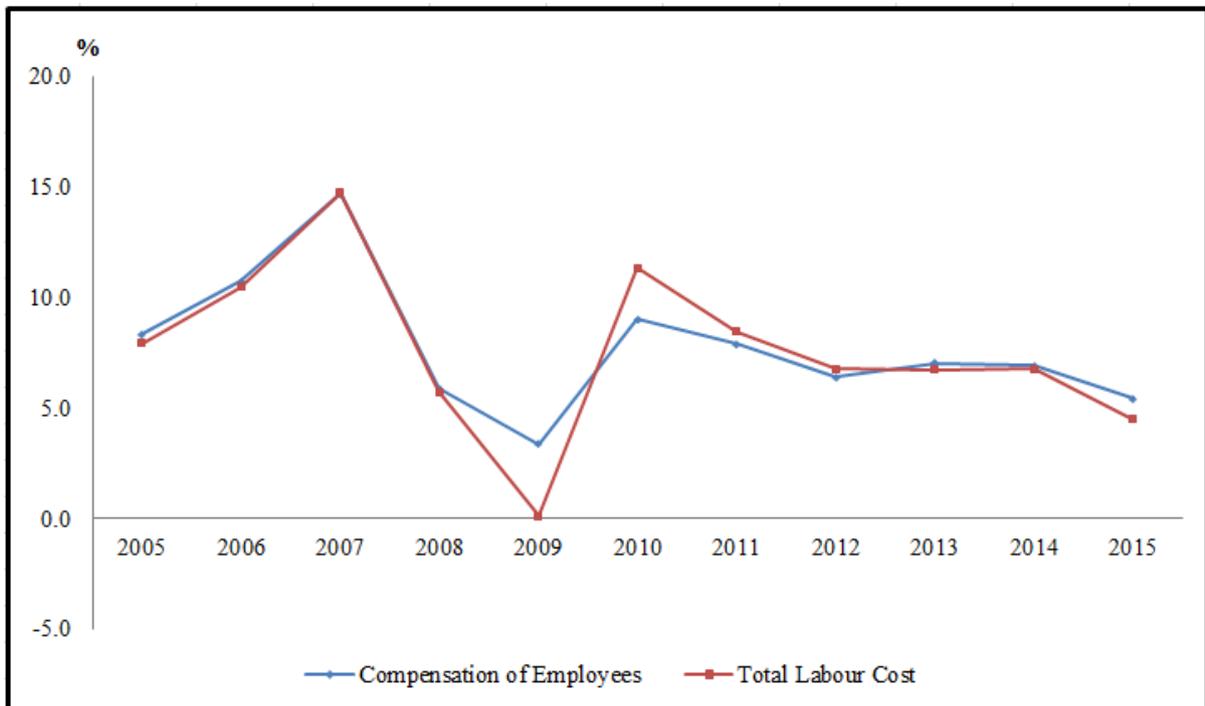
<sup>9</sup> Details on the Temporary Employment Credit are available at: <http://www.mom.gov.sg/employment-practices/schemes-for-employers-and-employees/temporary-employment-credit>

Chart 1: Share of CoE in TLC of the Overall Economy, 2005 – 2015



7. With CoE forming the largest component of TLC<sup>10</sup>, the underlying growth of TLC generally moved in tandem with that of CoE (Chart 2).

Chart 2: Changes in the CoE and TLC of the Overall Economy, 2005 – 2015

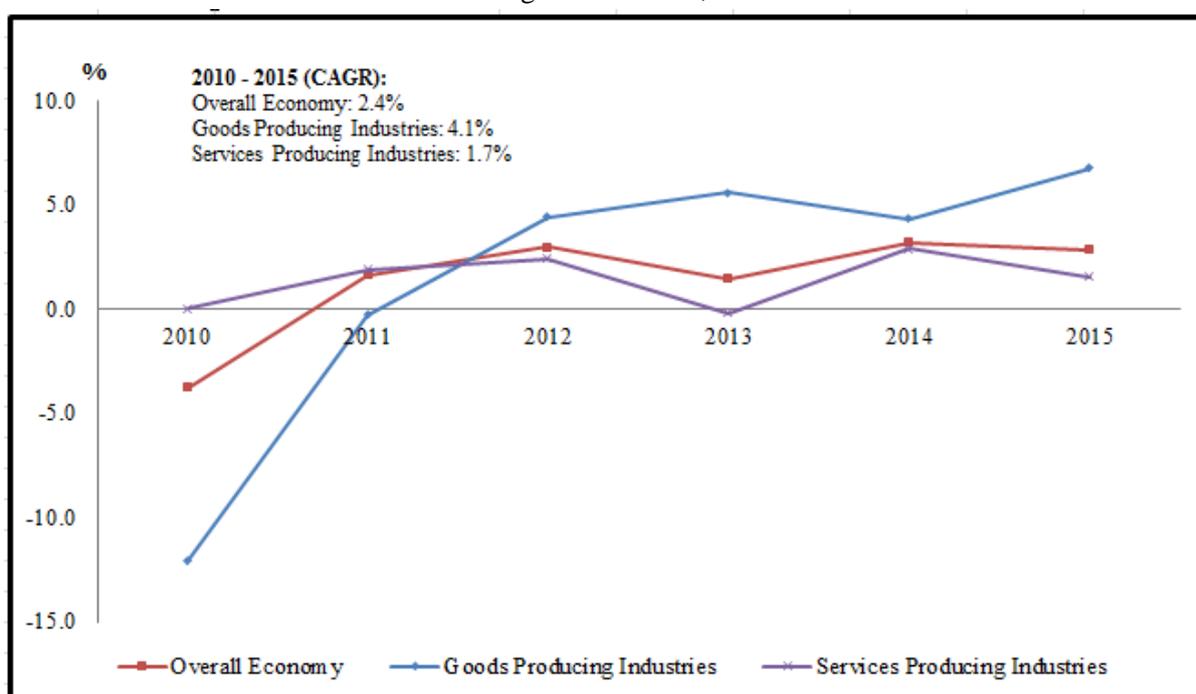


<sup>10</sup> A separate analysis on the relationship between real wage and real productivity growth is available in the feature article [“Productivity and Wage Growth in Singapore”](#) released in the Economic Survey of Singapore 2015.

Higher ULC Growth for Goods Producing Industries Compared to Services Producing Industries in Recent Years

8. From 2010 to 2015, the ULC for the overall economy grew at a CAGR of 2.4 per cent. The steady growth observed in the overall economy ULC in recent years was largely due to the growth in ULC of the goods producing industries (CAGR of 4.1 per cent), which was higher than the ULC growth of the services producing industries (CAGR of 1.7 per cent). As observed in Chart 3, the growth in ULC of the goods producing industries has outpaced the ULC growth of the services producing industries over the 2012 to 2015 period.

Chart 3: Changes in the ULC, 2010 – 2015



**V. CONCLUSION**

9. The expanded set of ULC indices facilitates analysis on labour cost by industry.

**APPENDIX**

**Table A.1 Unit Labour Cost Index by Industry (2010 = 100),  
1Q 2010 – 4Q 2012**

	2010				2011				2012			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>OVERALL ECONOMY</b>	107.1	90.2	96.1	106.6	109.1	95.3	95.8	106.4	110.1	97.5	100.4	110.5
Goods Producing Industries	113.6	82.3	93.2	110.9	107.0	91.9	91.9	108.1	111.6	93.2	98.0	113.6
Manufacturing	115.4	79.0	92.5	113.1	104.8	89.7	89.2	107.8	108.8	88.9	93.9	111.3
Construction	107.6	94.0	94.3	104.0	114.3	101.0	97.6	106.2	115.5	102.1	102.0	112.3
Utilities	108.4	86.6	93.1	111.8	120.4	87.3	95.4	106.0	116.0	97.6	104.3	118.3
Other Goods Industries <sup>1</sup>	112.6	87.2	94.2	105.9	99.2	94.1	104.3	109.0	106.6	97.7	100.7	108.2
Services Producing Industries	105.2	93.3	96.8	104.7	109.8	96.0	96.4	105.5	109.3	98.4	100.5	108.8
Wholesale & Retail Trade	108.6	91.8	92.0	107.6	110.0	93.8	92.3	110.2	113.9	93.2	95.2	108.6
Transportation & Storage	104.0	92.9	95.7	107.3	107.4	92.3	99.5	111.7	107.1	100.2	100.7	116.3
Accommodation & Food Services	107.2	96.4	95.5	100.9	109.4	94.6	94.9	108.1	113.7	102.4	102.2	114.0
Information & Communications	95.8	103.6	96.0	104.6	105.2	100.9	93.6	107.0	105.7	103.9	99.2	108.9
Finance & Insurance	99.8	94.9	101.4	103.8	106.9	100.7	98.6	98.6	105.0	101.9	101.1	99.5
Business Services	104.7	95.9	96.2	103.1	106.5	96.4	92.9	102.8	105.2	98.1	98.0	110.4
Other Services Industries	109.2	88.2	98.1	104.5	114.4	95.4	101.8	107.6	110.3	99.3	107.9	113.4

<sup>1</sup> Comprise Agriculture, Fishing and Quarrying.

Note: The industries are classified according to SSIC 2010.

**Table A.1 Unit Labour Cost Index by Industry (2010 = 100),  
1Q 2013 – 4Q 2015**

	2013				2014				2015			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>OVERALL ECONOMY</b>	113.5	99.3	100.3	111.4	116.8	102.5	104.1	114.9	120.5	106.1	106.7	117.0
Goods Producing Industries	123.7	99.2	100.5	116.3	123.2	104.6	105.8	124.6	132.9	112.9	112.8	130.4
Manufacturing	120.2	92.8	93.4	110.0	116.2	96.3	96.0	117.3	123.9	103.8	102.2	122.7
Construction	123.1	110.0	110.7	123.5	127.6	118.9	121.9	133.6	140.2	124.3	124.8	134.6
Utilities	128.8	109.4	107.0	130.2	152.8	113.2	112.6	135.1	162.8	119.6	125.0	135.1
Other Goods Industries <sup>1</sup>	96.1	87.2	80.3	97.5	84.2	92.7	87.9	105.8	93.7	98.3	93.2	108.9
Services Producing Industries	109.5	98.4	99.4	109.1	114.0	100.9	102.6	110.9	115.8	103.0	103.9	112.0
Wholesale & Retail Trade	107.9	92.0	93.5	107.2	111.6	94.9	94.5	109.8	110.2	92.5	90.6	103.6
Transportation & Storage	114.5	100.9	100.1	115.4	115.3	106.0	105.7	121.3	122.5	113.2	109.9	127.4
Accommodation & Food Services	119.5	105.4	105.6	118.3	122.3	110.6	110.1	122.3	127.1	116.8	113.8	126.2
Information & Communications	102.2	103.2	94.8	106.4	108.8	103.3	96.2	104.3	109.5	104.5	100.7	108.4
Finance & Insurance	94.0	95.1	94.1	93.5	98.1	94.0	93.4	93.2	95.7	95.2	94.5	96.1
Business Services	107.4	99.9	100.6	114.5	112.2	104.4	105.5	116.7	115.0	107.3	108.8	119.8
Other Services Industries	123.6	104.0	109.2	120.1	129.7	106.3	116.0	122.1	136.8	111.6	119.8	125.0

<sup>1</sup> Comprise Agriculture, Fishing and Quarrying.

Note: The industries are classified according to SSIC 2010.

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