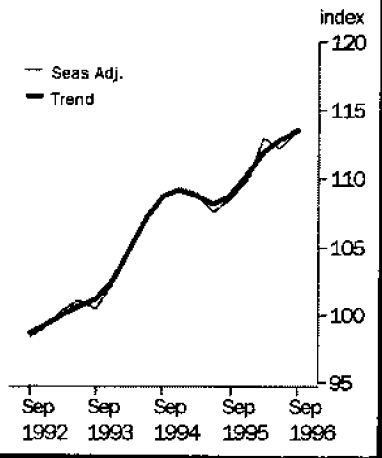
SEPTEMBER QUARTER 1996 8125.0

INDEXES OF INDUSTRIAL PRODUCTION

AUSTRALIA

EMBARGO: 11:30AM (CANBERRA TIME) TUES 10 DEC 1996

Total Industrial Production



SEPTEMBER QTR KEY FIGURES(a)

TREND ESTIMATES	% change Jun Qtr 96 to Sep Qtr 96	% change Sep Qtr 95 to Sep Qtr 96
Gross product at constant prices		
Mining(b)	1.0	7.1
Manufacturing	0.5	4.6
Electricity, gas and water	-0.2	0.5
Total industrial	0.5	4.4

SEASONALLY ADJUSTED	% change Jun Qtr 96 to Sep Qtr 96	% change Sep Qtr 95 to Sep Qtr 96
Gross product at constant prices		
Mining(b)	-1.1	4.6
Manufacturing	2.5	6.0
Electricity, gas and water	-0.9	-0.3
Total industrial	1.2	4.8

(a) At average 1989–90 prices

(b) Excludes services to mining

SEPTEMBER QTR KEY POINTS

TREND ESTIMATES

- Steady growth continues in the total industrial production index with a 0.5% increase in the September quarter.
- The pattern of industrial production shows ten consecutive quarters of growth to December quarter 1994 , with falls in March and June quarters 1995 , and a resumption of growth for the past five quarters.
- Both the Mining and Manufacturing industries recorded growth in September quarter (1.0% and 0.5% respectively) while production by the Electricity, gas and water industry fell by 0.2%.
- The manufacturing industry's performance was mixed with four manufacturing subdivisions recording rises in September quarter while five subdivisions recorded falls. The most significant movements were by Printing, publishing and recorded media (down 3.5%) and Machinery and equipment manufacturing (up 3.3%).

SEASONALLY ADJUSTED ESTIMATES

- The total industrial production estimate was 1.2% higher than for June quarter .
- Manufacturing industry recorded growth of 2.5% while Mining fell by 1.1% and the Utilities by 0.9%.

INQUIRIES

- For further information about these and related statistics, contact Name on Number, or any ABS Office.

NOTES

FORTHCOMING ISSUES

ISSUE (Quarter)	*RELEASE DATE*
December 1996	11 March 1997

CHANGES IN THIS ISSUE

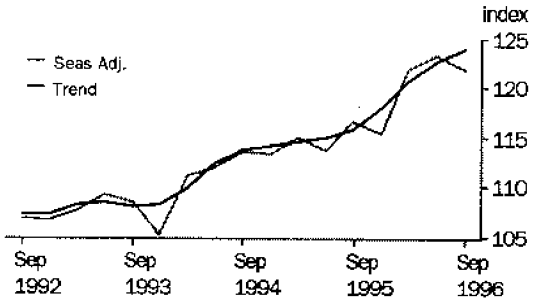
Revisions in this issue have arisen from revisions to the data for quarterly manufacturers sales and stocks. The effect of these revisions on the total manufacturing series of estimates is minor. The effect on manufacturing subdivisions has been variable with some subdivisions experiencing a marked shift in level for recent quarters but a much lesser change to quarterly movements. There has also been some adjustment to the benchmarking process (mainly carried out for the June quarter 1996 issue). The effects of this were minor for all industries except Petroleum, coal, chemical and associated product manufacturing.

W. McLennan
Australian Statistician

INDEX NUMBERS: BASE OF INDEX 1989–90 = 100.0

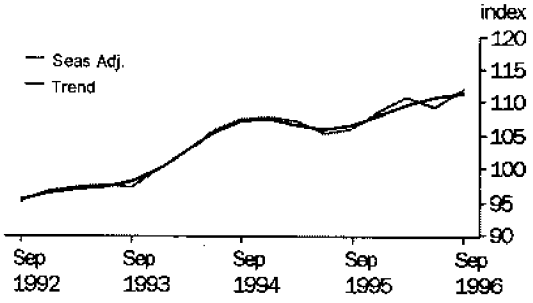
MINING

The rise of 1.0% in the September quarter 1996 trend estimate was the twelfth successive rise. Mining production in the September quarter 1996 was 7.1% higher than September quarter 1995 and 9.0% higher than September quarter 1994.



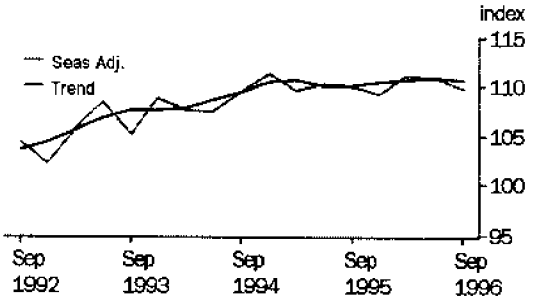
MANUFACTURING

The rise of 0.5% in the September quarter 1996 trend estimate continues the pattern of growth exhibited since June quarter 1992. Continuous growth over the period has been interrupted only by falls in the March and June quarters 1995. Production in the September quarter 1996 was 4.6% higher than September quarter 1995 and 3.8% higher than September quarter 1994.



ELECTRICITY, GAS AND WATER

Trend estimates for the electricity, gas and water utilities show stable production levels over recent quarters. Since December quarter 1994, all quarterly movements in this series have been of 0.5% or less. Production in the September quarter 1996 was 0.5% higher than September quarter 1995 and 1.1% higher than September quarter 1994.



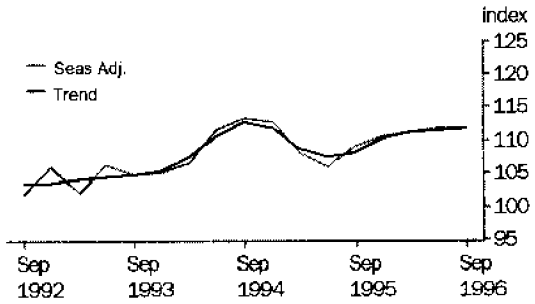
(a) At average 1989–90 prices

MANUFACTURING: Gross product(a)

INDEX NUMBERS: BASE OF INDEX 1989–90 = 100.0

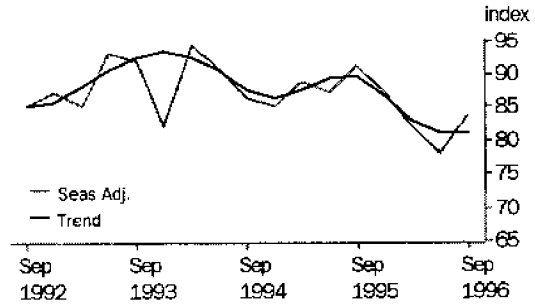
FOOD, BEVERAGE AND TOBACCO

The rise of 0.3% in the September quarter 1996 trend estimate was the fifth successive rise following falls in each of the three quarters to June 1995. Production in the September quarter 1996 was 3.3% higher than September quarter 1995 but 0.7% lower than September quarter 1994.



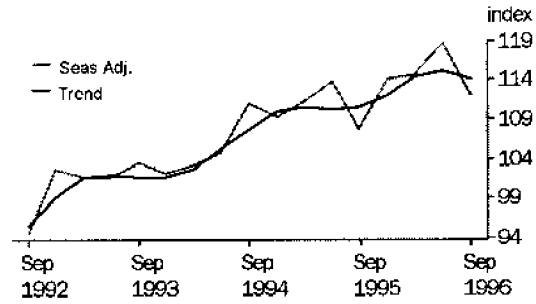
TEXTILE, CLOTHING, FOOTWEAR AND LEATHER

The marginal rise of 0.1% in the September quarter 1996 trend estimate was the first rise since September Quarter 1995. Despite the rise, production in the September quarter 1996 was 9.4% lower than September quarter 1995 and 7.4% lower than September quarter 1994.



WOOD AND PAPER PRODUCT

The fall of 0.9% in the September quarter 1996 trend estimate followed four quarters of growth after a minor fall in June Quarter 1995. Prior to that, the series had grown steadily from March quarter 1994. Production in the September quarter 1996 was 3.3% higher than September quarter 1995 and 5.8% higher than September quarter 1994.

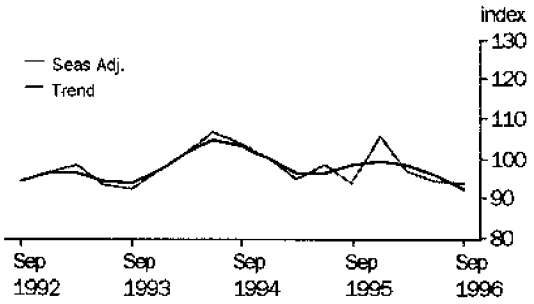


(a) At average 1989–90 prices

INDEX NUMBERS: BASE OF INDEX 1989–90 = 100.0

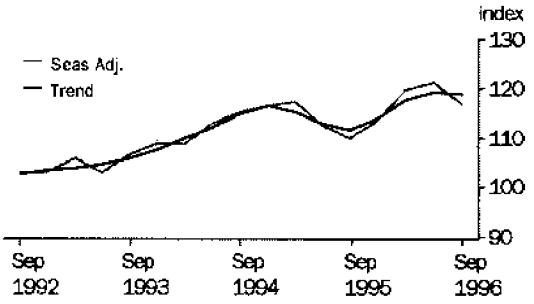
PRINTING, PUBLISHING AND RECORDED MEDIA

The fall of 3.5% in the September quarter 1996 trend estimate was the third successive fall. Since June quarter 1994 this series has risen only twice. Production in the September quarter 1996 was 6.1% lower than September quarter 1995 and 10.6% lower than September quarter 1994.



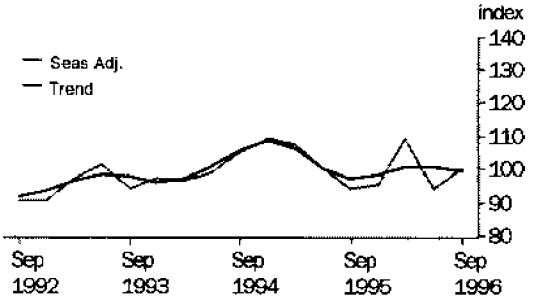
PETROLEUM, COAL, CHEMICAL AND ASSOCIATED PRODUCT

The fall of 0.3% in the September quarter 1996 trend estimate followed three successive quarters of rises which in turn followed three successive quarters of falls. Production in the September quarter 1996 was 6.7% higher than September quarter 1995 but only 3.5% higher than September quarter 1994.



NON-METALLIC MINERAL PRODUCT

The fall of 1.4% in the September quarter 1996 trend estimate followed two rises in December quarter 1995 and March quarter 1996 then no change in June quarter 1996. Production in the September quarter was 2.3% higher than September quarter 1995 but 6.0% lower than September quarter 1994.

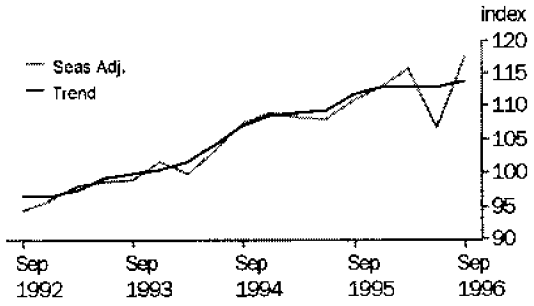


(a) At average 1989–90 prices

INDEX NUMBERS: BASE OF INDEX 1989–90 = 100.0

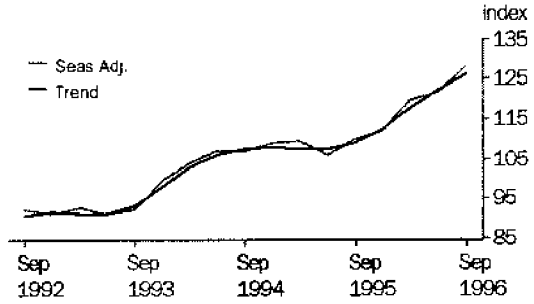
METAL PRODUCT

The rise of 0.8% in the September quarter 1996 trend estimate was the fifteenth successive rise except for the March quarter 1996 which exhibited no change. Production in the September quarter 1996 was 2.2% higher than September quarter 1995 and 6.5% higher than September quarter 1994.



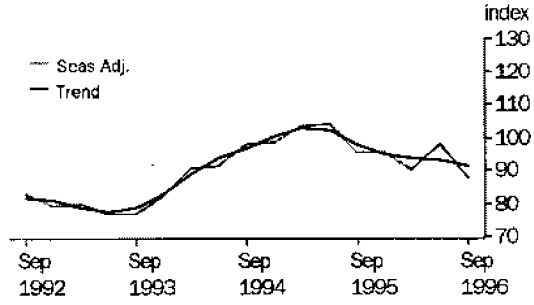
MACHINERY AND EQUIPMENT

The rise of 3.3% in the September quarter 1996 trend estimate was the fifth successive rise following two falls. Prior to those falls, the series had risen continuously from June quarter 1993. Production in the September quarter 1996 was 16.1% higher than September quarter 1995 and 17.6% higher than September quarter 1994.



OTHER MANUFACTURING

The fall of 1.7% in the September quarter 1996 trend estimate was the sixth successive fall following a period of continuous growth from June quarter 1993. Production in the September quarter 1996 was 6.9% lower than September quarter 1995 and 5.7% lower than September quarter 1994.



(a) At average 1989–90 prices

1 TOTAL INDUSTRIAL GROSS PRODUCT(a), Index Numbers(b)

Quarters	*Mining (excluding services to mining)*	*Total manufacturing*	*Electricity, gas and water*	*Total industrial*
		ORIGINAL		
1993-94				
September	113.0	99.1	109.2	**103.1**
December	104.6	104.1	107.8	**104.7**
March	107.3	97.2	105.8	**100.3**
June	112.2	104.2	106.2	**105.9**
1994-95				
September	118.3	109.6	113.5	**111.8**
December	112.6	112.5	110.3	**112.2**
March	110.9	101.6	107.6	**104.2**
June	114.0	103.8	109.1	**106.4**
1995-96				
September	121.5	107.9	114.4	**111.3**
December	114.4	113.3	108.1	**112.8**
March	117.7	105.3	109.2	**108.1**
June	123.8	107.9	109.7	**111.1**
1996-97				
September	127.0	114.4	114.1	**116.7**
		SEASONALLY ADJUSTED		
1993-94				
September	108.5	97.1	105.3	**100.4**
December	105.2	99.8	108.8	**102.1**
March	111.2	102.4	107.7	**104.8**
June	112.0	105.6	107.5	**107.0**
1994-95				
September	113.5	107.4	109.4	**108.8**
December	113.4	107.8	111.3	**109.4**
March	114.9	107.1	109.6	**108.9**
June	113.8	105.3	110.3	**107.5**
1995-96				
September	116.6	105.8	110.2	**108.4**
December	115.4	108.6	109.3	**109.9**
March	121.9	110.9	111.2	**113.0**
June	123.4	109.4	110.9	**112.2**
1996-97				
September	122.0	112.1	109.9	**113.6**
		TREND ESTIMATES		
1993-94				
September	108.1	97.9	107.7	**101.1**
December	108.3	99.8	107.7	**102.5**
March	110.0	102.6	107.9	**104.7**
June	112.3	105.4	108.6	**107.1**
1994-95				
September	113.8	107.2	109.5	**108.7**
December	114.1	107.6	110.5	**109.2**
March	114.6	106.6	110.7	**108.7**
June	114.9	105.8	110.2	**108.1**
1995-96				
September	115.8	106.4	110.1	**108.7**
December	118.1	108.1	110.5	**110.3**
March	120.8	109.7	110.8	**111.9**
June	122.8	110.7	110.9	**112.9**
1996-97				
September	124.0	111.3	110.7	**113.5**

(a) At average 1989–90 prices

(b) Base of index 1989–90 = 100.0

2 TOTAL INDUSTRIAL GROSS PRODUCT(a), Percentage Changes

Quarters	*Mining (excluding services to mining)*	*Total manufacturing*	*Electricity, gas and water*	***Total industrial***
		ORIGINAL		
1993-94				
September	3.5	3.3	2.1	**3.1**
December	–7.4	5.0	–1.3	**1.6**
March	2.6	–6.6	–1.9	**–4.2**
June	4.6	7.2	0.4	**5.6**
1994-95				
September	5.4	5.2	6.9	**5.6**
December	–4.8	2.6	–2.8	**0.4**
March	–1.5	–9.7	–2.4	**–7.1**
June	2.8	2.2	1.4	**2.1**
1995-96				
September	6.6	3.9	4.9	**4.6**
December	–5.8	5.0	–5.5	**1.3**
March	2.9	–7.1	1.0	**–4.2**
June	5.2	2.5	0.5	**2.8**
1996-97				
September	2.6	6.0	4.0	**5.0**
		SEASONALLY ADJUSTED		
1993-94				
September	–0.6	–0.1	–2.9	**–0.6**
December	–3.0	2.8	3.3	**1.7**
March	5.7	2.6	–1.0	**2.6**
June	0.7	3.1	–0.2	**2.1**
1994-95				
September	1.3	1.7	1.8	**1.7**
December	–0.1	0.4	1.7	**0.6**
March	1.3	–0.6	–1.5	**–0.5**
June	–1.0	–1.7	0.6	**–1.3**
1995-96				
September	2.5	0.5	–0.1	**0.8**
December	–1.0	2.6	–0.8	**1.4**
March	5.6	2.1	1.7	**2.8**
June	1.2	–1.4	–0.3	**–0.7**
1996-97				
September	–1.1	2.5	–0.9	**1.2**
		TREND ESTIMATES		
1993-94				
September	–0.4	0.9	0.7	**0.6**
December	0.2	1.9	0.0	**1.4**
March	1.6	2.8	0.2	**2.1**
June	2.1	2.7	0.6	**2.3**
1994-95				
September	1.3	1.7	0.8	**1.5**
December	0.3	0.4	0.9	**0.5**
March	0.4	–0.9	0.2	**–0.5**
June	0.3	–0.8	–0.5	**–0.6**
1995-96				
September	0.8	0.6	–0.1	**0.6**
December	2.0	1.6	0.4	**1.5**
March	2.3	1.5	0.3	**1.5**
June	1.7	0.9	0.1	**0.9**
1996-97				
September	1.0	0.5	–0.2	**0.5**

(a) At average 1989–90 prices

MANUFACTURING GROSS PRODUCT(a), By ANZSIC Subdivision–Index Numbers(b)

Quarters	*Food, beverage and tobacco mfg*	*Textile, clothing, footwear and leather mfg*	*Wood and paper product mfg*	*Printing, publishing and recorded media*	*Petroleum, coal, chemical and assoc. product mfg*	*Non-metallic mineral product mfg*	*Metal product mfg*	*Machinery and equipment mfg*	*Other manufacturing*	***Total manufacturing***
					ORIGINAL					
1993-94										
September	104.9	94.8	107.0	94.1	108.4	97.5	101.2	94.2	80.3	**99.1**
December	112.5	84.2	107.7	102.7	110.4	99.6	103.8	102.7	89.8	**104.1**
March	102.3	89.6	98.0	95.1	105.7	90.9	95.3	97.2	83.4	**97.2**
June	108.0	90.2	100.4	105.3	112.0	97.7	102.5	107.6	86.4	**104.2**
1994-95										
September	113.4	88.8	114.5	105.0	117.7	109.5	110.3	109.6	102.9	**109.6**
December	120.8	87.1	115.5	105.9	118.4	112.4	111.5	112.6	107.7	**112.5**
March	103.8	84.7	105.6	88.8	114.4	101.9	103.4	102.8	95.4	**101.6**
June	102.8	86.8	109.1	97.3	111.5	98.7	107.6	106.3	98.6	**103.8**
1995-96										
September	109.4	93.7	111.2	95.1	112.2	97.3	113.6	112.5	100.0	**107.9**
December	118.6	89.0	120.8	111.6	115.5	97.7	115.7	116.1	104.7	**113.3**
March	106.5	78.4	108.8	90.8	116.7	103.3	110.3	112.6	82.8	**105.3**
June	108.4	77.6	113.8	93.5	120.3	92.8	106.2	121.8	93.1	**107.9**
1996-97										
September	112.1	86.2	115.9	94.8	119.3	103.6	120.6	131.3	91.8	**114.4**
					SEASONALLY ADJUSTED					
1993-94										
September	104.9	92.0	103.5	92.4	106.6	93.9	98.8	91.9	76.8	**97.1**
December	105.1	82.2	102.2	97.0	108.7	97.1	101.5	99.2	82.0	**99.8**
March	106.5	94.4	103.2	101.3	108.6	96.4	99.8	104.1	91.1	**102.4**
June	111.5	90.9	104.6	106.6	112.7	99.1	103.1	107.1	91.2	**105.6**
1994-95										
September	113.3	86.3	111.0	103.3	115.5	105.4	107.6	107.0	98.2	**107.4**
December	112.8	85.2	109.3	99.9	116.6	109.6	109.0	108.8	98.6	**107.8**
March	108.3	89.0	111.3	94.6	117.4	107.8	108.5	109.6	103.8	**107.1**
June	106.0	87.3	113.8	98.3	112.4	99.9	108.2	106.1	104.1	**105.3**
1995-96										
September	109.1	91.3	107.8	93.8	110.1	93.9	110.8	109.9	95.6	**105.8**
December	110.6	87.2	114.2	105.3	113.8	95.3	113.1	112.1	96.0	**108.6**
March	111.3	82.2	114.6	97.0	119.6	109.3	115.8	119.9	89.9	**110.9**
June	111.7	78.1	118.8	94.4	121.3	94.0	106.8	121.6	98.3	**109.4**
1996-97										
September	111.9	84.1	112.1	93.6	117.0	100.0	117.7	128.3	87.6	**112.1**
					TREND ESTIMATES					
1993-94										
September	104.7	92.4	101.7	93.7	105.8	97.6	99.9	93.3	78.5	**97.9**
December	105.5	93.5	101.7	96.7	107.5	96.2	100.3	97.9	82.9	**99.8**
March	107.4	92.7	102.8	101.6	109.8	97.0	101.6	103.0	88.8	**102.6**
June	110.7	90.6	105.1	104.6	112.2	100.8	104.0	106.1	93.6	**105.4**
1994-95										
September	112.7	87.8	107.8	103.2	115.1	105.6	107.0	107.5	97.1	**107.2**
December	111.7	86.5	110.0	99.9	116.7	108.7	108.8	108.0	100.9	**107.6**
March	108.9	87.6	110.7	96.3	115.4	106.6	109.1	107.7	103.2	**106.6**
June	107.5	89.4	110.4	96.1	112.7	100.2	109.4	107.4	102.3	**105.8**
1995-96										
September	108.3	89.7	110.5	98.3	111.6	97.1	111.6	108.9	98.4	**106.4**
December	110.2	86.6	112.2	99.6	114.2	98.6	113.0	112.6	95.1	**108.1**
March	111.2	83.2	114.3	98.3	117.8	100.7	113.0	117.7	94.0	**109.7**
June	111.6	81.2	115.1	95.6	119.5	100.7	113.1	122.4	93.2	**110.7**
1996-97										
September	111.9	81.3	114.1	92.3	119.1	99.3	114.0	126.4	91.6	**111.3**

(a) At average 1989–90 prices

(b) Base of index 1989–90 = 100.0

4 MANUFACTURING GROSS PRODUCT(a), By ANZSIC Subdivision—Percentage Changes

Quarters	*Food, beverage and tobacco mfg*	*Textile, clothing, footwear and leather mfg*	*Wood and paper product mfg*	*Printing, publishing and recorded media*	*Petroleum, coal, chemical and assoc. product mfg*	*Non-metallic mineral product mfg*	*Metal product mfg*	*Machinery and equipment mfg*	*Other manufacturing*	***Total manufacturing***
					ORIGINAL					
1993-94										
September	2.1	2.6	9.5	2.8	5.7	–2.0	3.0	2.6	10.3	**3.3**
December	7.2	–11.2	0.7	9.1	1.8	2.2	2.6	9.0	11.8	**5.0**
March	–9.1	6.4	–9.0	–7.4	–4.3	–8.7	–8.2	–5.4	–7.1	**–6.6**
June	5.6	0.7	2.4	10.7	6.0	7.5	7.6	10.7	3.6	**7.2**
1994-95										
September	5.0	–1.6	14.0	–0.3	5.1	12.1	7.6	1.9	19.1	**5.2**
December	6.5	–1.9	0.9	0.9	0.6	2.6	1.1	2.7	4.7	**2.6**
March	–14.1	–2.8	–8.6	–16.1	–3.4	–9.3	–7.3	–8.7	–11.4	**–9.7**
June	–1.0	2.5	3.3	9.6	–2.5	–3.1	4.1	3.4	3.4	**2.2**
1995-96										
September	6.4	7.9	1.9	–2.3	0.6	–1.4	5.6	5.8	1.4	**3.9**
December	8.4	–5.0	8.6	17.4	2.9	0.4	1.8	3.2	4.7	**5.0**
March	–10.2	–11.9	–9.9	–18.6	1.0	5.7	–4.7	–3.0	–20.9	**–7.1**
June	1.8	–1.0	4.6	3.0	3.1	–10.2	–3.7	8.2	12.4	**2.5**
1996-97										
September	3.4	11.1	1.8	1.4	–0.8	11.6	13.6	7.8	–1.4	**6.0**
					SEASONALLY ADJUSTED					
1993-94										
September	–1.2	–1.2	1.9	–0.8	3.6	–7.2	0.2	0.9	0.4	**–0.1**
December	0.2	–10.7	–1.3	5.0	2.0	3.4	2.7	7.9	6.8	**2.8**
March	1.3	14.8	1.0	4.4	–0.1	–0.7	–1.7	4.9	11.1	**2.6**
June	4.7	–3.7	1.4	5.2	3.8	2.8	3.3	2.9	0.1	**3.1**
1994-95										
September	1.6	–5.1	6.1	–3.1	2.5	6.4	4.4	–0.1	7.7	**1.7**
December	–0.4	–1.3	–1.5	–3.3	1.0	4.0	1.3	1.7	0.4	**0.4**
March	–4.0	4.5	1.8	–5.3	0.7	–1.6	–0.5	0.7	5.3	**–0.6**
June	–2.1	–1.9	2.2	3.9	–4.3	–7.3	–0.3	–3.2	0.3	**–1.7**
1995-96										
September	2.9	4.6	–5.3	–4.6	–2.0	–6.0	2.4	3.6	–8.2	**0.5**
December	1.4	–4.5	5.9	12.3	3.4	1.5	2.1	2.0	0.4	**2.6**
March	0.6	–5.7	0.4	–7.9	5.1	14.7	2.4	7.0	–6.4	**2.1**
June	0.4	–5.0	3.7	–2.7	1.4	–14.0	–7.8	1.4	9.3	**–1.4**
1996-97										
September	0.2	7.7	–5.6	–0.8	–3.5	6.4	10.2	5.5	–10.9	**2.5**
					TREND ESTIMATES					
1993-94										
September	0.1	2.0	–0.3	–0.6	1.1	–0.7	0.8	2.4	1.8	**0.9**
December	0.8	1.2	0.0	3.2	1.6	–1.4	0.4	4.9	5.6	**1.9**
March	1.8	–0.9	1.1	5.1	2.1	0.8	1.3	5.2	7.1	**2.8**
June	3.1	–2.3	2.2	3.0	2.2	3.9	2.4	3.0	5.4	**2.7**
1994-95										
September	1.8	–3.1	2.6	–1.3	2.6	4.8	2.9	1.3	3.7	**1.7**
December	–0.9	–1.5	2.0	–3.2	1.4	2.9	1.7	0.5	3.9	**0.4**
March	–2.5	1.3	0.6	–3.6	–1.1	–1.9	0.3	–0.3	2.3	**–0.9**
June	–1.3	2.1	–0.3	–0.2	–2.3	–6.0	0.3	–0.3	–0.9	**–0.8**
1995-96										
September	0.7	0.3	0.1	2.3	–1.0	–3.1	2.0	1.4	–3.8	**0.6**
December	1.8	–3.5	1.5	1.3	2.3	1.5	1.3	3.4	–3.4	**1.6**
March	0.9	–3.9	1.9	–1.3	3.2	2.1	0.0	4.5	–1.2	**1.5**
June	0.4	–2.4	0.7	–2.7	1.4	0.0	0.1	4.0	–0.9	**0.9**
1996-97										
September	0.3	0.1	–0.9	–3.5	–0.3	–1.4	0.8	3.3	–1.7	**0.5**

(a) At average 1989–90 prices

EXPLANATORY NOTES

INTRODUCTION

1 This publication presents in index number form, quarterly estimates of gross product at constant average 1989–90 prices for the non-farm, goods producing sector which, for brevity, is termed the 'total industrial' (see paragraph 3).

2 Also presented are indexes for component industries, including individual manufacturing subdivisions.

SCOPE AND COVERAGE

3 The scope of 'total industrial' referred to in this publication is defined to include all establishments classified to the Australian and New Zealand Standard Industrial Classification (ANZSIC) Division B (Mining), excluding ANZSIC subdivision 15 (Services to mining); Division C (Manufacturing); and Division D (Electricity, gas and water).

4 The base year weights used in constructing the indexes in this publication have been derived from establishment data. However, the quarterly indicator series used for manufacturing are based on data relating to business units which may cover more than one establishment.

5 The table below sets out the base year weights associated with the major components of the industrial sector, and each manufacturing subdivision.

	1989–90 Weight %
Mining (excluding services to mining)	18.0
Manufacturing	67.5
Food, beverage and tobacco mfg	13.7
Textiles, clothing, footwear and leather mfg	3.7
Wood and paper product mfg	3.5
Printing, publishing and recorded media	6.4
Petroleum, coal, chemical and associated product mfg	6.5
Non-metallic mineral product mfg	3.4
Metal product mfg	11.4
Machinery and equipment mfg	15.6
Other manufacturing	3.3
Electricity, gas and water	14.5
Total Industrial sector	100.0

6 Quarterly manufacturers' sales and stocks data provides the main indicator series for the manufacturing indexes. As a result, these indexes have three important limitations as measures of manufacturing production:

- changes in quarterly production by manufacturing establishments of non-manufacturing businesses are not reflected in the indexes;
- changes in a part of the quarterly production of non-manufacturing establishments of manufacturing businesses are reflected in the indexes; and
- changes in quarterly production by government bodies such as shipyards are not reflected in the indexes.

7 The scope of the data used in the manufacturing indicator series also differs slightly from the general definition of manufacturing gross product. The stocks estimates used include finished goods bought in, but not manufactured, by a business. As far as can be assessed this has not had a significant influence on the estimates.

EXPLANATORY NOTES

DERIVATION OF THE ESTIMATES OF GROSS PRODUCT

8 The estimates are derived using the gross output method whereby base year (1989–90) estimates of gross product are extrapolated by constant price estimates of gross output. All the quarterly indexes contained in this publication have been benchmarked, where possible, to annual estimates (see paragraph 12 below).

9 For further details on the derivation of constant price gross product for individual industries refer to Chapter 18 in *Australian National Accounts : Concepts, Sources and Methods* (5216.0).

BENCHMARKING

10 Deriving quarterly estimates presents special problems in that it is often difficult to adhere strictly to the definitions and concepts used in annual estimates. Frequently, it is not possible to use the same data sources as used for annual estimates, and alternative quarterly data sources are generally much less detailed.

11 For example, annual estimates of gross product for the Mining industry (as published in *Australian National Accounts : National Income, Expenditure and Product* (5204.0)) are compiled (using the double deflation method) from detailed output and input data from the annual census of mining establishments. On the other hand, the quarterly series draw on the quantities of minerals mined (gross output), reported in surveys of mining establishments.

12 In such cases, where the quarterly estimates are inferior to the annual, the quarterly estimates are adjusted to agree with the annual estimates in such a way that preserves, as far as practical, the movements of the quarterly series. This is commonly referred to as benchmarking.

DATA SOURCES FOR QUARTERLY OUTPUT SERIES

MINING (EXCLUDING SERVICES TO MINING)

13 Quarterly constant price output estimates are derived for major ANZSIC classes by quantity revaluation (i.e. quantities produced each quarter multiplied by associated base year (1989–90) average prices). Estimates of quantities produced are obtained from data contained in Quarterly Mineral Statistics (Australian Bureau of Agricultural and Resource Economics) and *The Australian Mining Industry* (8414.0).

14 Constant price estimates of value added are derived by the gross output method (see paragraph 8) for each ANZSIC class. Total quarterly estimates of value added are then benchmarked (see paragraph 12) to annual gross product estimates obtained from the mining census.

MANUFACTURING

15 Quarterly constant price estimates of gross output for each manufacturing industry subdivision (excluding petroleum refining) are derived by summing constant price estimates of manufacturers' sales of manufactured goods, other operating revenue (where significant) and changes in the level of stocks of finished goods and work-in-progress.

16 Constant price estimates of all components of manufacturing output except petroleum refining are derived by price deflation, i.e. current price components (obtained from the quarterly Survey of Stocks and Manufacturers' Sales) are deflated by fixed weighted producer price indexes (published in *Price Indexes of Articles Produced by Manufacturing Industry, Australia* (6412.0)).

17 Quarterly petroleum refining estimates are based on quarterly quantity data published in *Major Energy Statistics* (released by the Department of Primary Industries and Energy).

MANUFACTURING (continued)

18 Quarterly constant price estimates of output are used to derive constant price estimates of gross product at factor cost by the gross output method. The latter estimates are then benchmarked to corresponding annual estimates of gross product at market prices (based on annual Manufacturing Survey data).

ELECTRICITY

19 Quarterly quantities of electricity produced, as published in *Manufacturing Production, Australia* (8301.0), are benchmarked to annual gross product estimates based on the quantity of electricity sold (published by the Electricity Supply Association of Australia in *The Electricity Industry of Australia*).

GAS

20 Quarterly quantities of gas available through mains, as published in *Manufacturing Production, Australia* (8301.0), are benchmarked to gross product estimates derived from ABS economic census data relating to the performance of the gas production and distribution industry.

WATER AND SEWERAGE

21 Quarterly constant price output estimates are derived by quantity revaluation, i.e. quantities of water sold (to final consumers and for irrigation) and sewerage connections, are multiplied by average 1989–90 prices for each type of service.

22 The quantity data are supplied by a selection of State and Local government authorities. Quarterly output estimates are then benchmarked to annual constant price gross product estimates.

SAMPLE REVISION

23 Each year the sample used for the survey of stocks and manufacturers' sales is revised. Differences between the old and revised samples have in general been apportioned back over the preceding quarters of each year, and incorporated in the estimates included in this publication.

24 For more information on the sample revision, refer to *Stocks, Selected Industry Sales and Expected Sales, Australia* (5629.0).

RELIABILITY OF ESTIMATES

25 Because the measures used in the derivation of the manufacturing indexes are based on a sample survey, the indexes themselves are subject to sampling variability.

26 In terms of original estimates the standard errors in percentage terms approximate the errors reported in *Stocks, Selected Industry Sales and Expected Sales, Australia* (5629.0). However, for constant price estimates the standard errors may be up to 10 per cent higher than those for the corresponding current price estimates because of the sampling variability contained in the prices data used to deflate the current price estimates. Seasonally adjusting the estimates has an insignificant effect on standard errors.

27 The imprecision due to sampling variability, which is measured by the standard error, should not be confused with inaccuracies that may occur because of imperfections in reporting by respondents and errors made in collecting and processing data. Inaccuracies of this kind are known as non-sampling errors and may occur in any collection, whether it be a sample or a full count.

28 In addition to the non-sampling errors which may occur in current prices estimates, there may be non-sampling errors introduced by the process of compiling constant price estimates. These further errors may arise from the introduction of additional data and from the assumptions and approximations which are necessary in compiling constant price estimates.

29 Every effort is made to minimise non-sampling errors by careful design of forms, editing of data and efficient operating procedures.

EXPLANATORY NOTES

SEASONAL ADJUSTMENT

30 Seasonal adjustment is a means of removing the estimated effects of normal seasonal variation from the series so that the effects of other influences on the series may be more clearly recognised.

31 Seasonal adjustment procedures do not aim to remove the irregular or non-seasonal influences which may be present in any particular quarter, such as the effect of a major industrial dispute or major plant breakdowns.

32 Irregular factors of this nature can make it difficult to interpret the movement of the series even after adjustment for seasonal variation.

33 Seasonal adjustment may be carried out by various methods and the results may vary slightly according to the procedure adopted. Accordingly, seasonally adjusted statistics should not be regarded as in any way definitive.

34 In interpreting particular seasonally adjusted statistics it is important to note the methods by which they have been derived and the limitations to which the methods used are subject. Details of the various seasonal adjustment methods used are available on request.

TREND ESTIMATES

35 The seasonally adjusted series can be smoothed to reduce the impact of the irregular component in the adjusted series. There are a number of ways of accomplishing this, depending on the intended uses of the smoothed series.

36 If importance is attached to measuring the underlying change in the most recent periods, moving averages employing appropriate weighting patterns should be adopted; the choice of averaging technique will determine the degree of smoothness of the derived series.

37 For example, a 9-term moving average will even out more of the short term fluctuation in a series (and therefore appear 'smoother') than will a 5-term moving average. However, the longer the term of the moving average the longer the series affected by revisions resulting from more recent data becoming available.

38 Such smoothed seasonally adjusted estimates are referred to as 'trend estimates' in this publication.

39 Trend estimates included in this issue are derived using a 7-term Henderson moving average. (The weights of the 7-term average are available upon request.) As a moving average approaches the end of a time series and begins to run out of observations, asymmetric averages have been used. Unlike the asymmetric weights of the standard 7-term Henderson moving averages, the weights employed here have been tailored to suit the particular characteristics of individual manufacturing subdivisions.

40 Users may wish to refer to the ABS Information Paper *A Guide to Interpreting Time Series – Monitoring Trends – An Overview* (1348.0) for more detailed information on smoothing seasonally adjusted time series data.

EXPLANATORY NOTES

RELATED PUBLICATIONS

41 Users may also wish to refer to the following publications:

- *Australian National Accounts : National Income, Expenditure and Product* (5204.0) — issued annually
- *Australian National Accounts : National Income, Expenditure and Product* (5206.0) — issued quarterly
- *Australian National Accounts : Concepts, Sources and Methods* (5216.0)
- *Manufacturing Industry, Australia* (8221.0) — issued annually
- *The Australian Mining Industry* (8414.0) — issued annually
- *Price Indexes of Articles Produced by Manufacturing Industry, Australia* (6412.0) — issued monthly
- *Manufacturing Production, Australia* (8301.0) — issued monthly
- *Stocks, Selected Industry Sales and Expected Sales, Australia* (5629.0) — issued quarterly

42 Current publications produced by the ABS are listed in the *Catalogue of Publications and Products, Australia* (1101.0). The ABS also issues on Tuesdays and Fridays, a *Release Advice* (1105.0) which lists publications to be released in the next few days. The Catalogue and Release Advice are available from any ABS office.

SYMBOLS AND OTHER USAGES

ANZSIC Australian and New Zealand Standard Industrial Classification

Australian Bureau of Statistics

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2812500009968
ISSN 1326-9526

RRP $14.00

Produced by the Australian Government Publishing Service