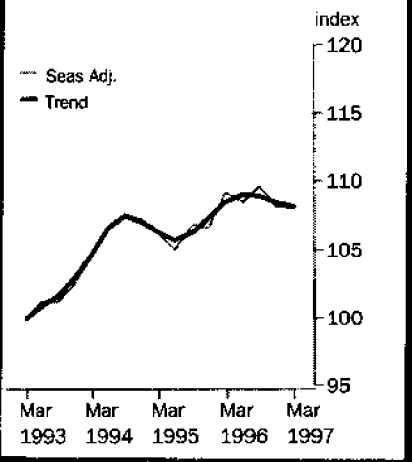
Australian Bureau of Statistics

INDEXES OF INDUSTRIAL PRODUCTION

AUSTRALIA

EMBARGO: 11:30AM (CANBERRA TIME) TUES 10 JUN 1997

Total Industrial Production



MARCH QTR KEY FIGURES(a)

TREND ESTIMATES	% change Dec Qtr 96 to Mar Qtr 97	% change Mar Qtr 96 to Mar Qtr 97
Gross product at constant prices		
Mining(b)	0.0	1.2
Manufacturing	–0.6	–1.0
Electricity, gas and water	0.7	1.2
Total industrial	–0.3	–0.2

SEASONALLY ADJUSTED	% change Dec Qtr 96 to Mar Qtr 97	% change Mar Qtr 96 to Mar Qtr 97
Gross product at constant prices		
Mining(b)	–0.3	0.9
Manufacturing	–0.2	–2.2
Electricity, gas and water	1.0	1.1
Total industrial	–0.1	–1.1

(a) At average 1989–90 prices

(b) Excludes services to mining

MARCH QTR KEY POINTS

TREND ESTIMATES

- The pattern of industrial production shows nine consecutive quarters of growth to September quarter 1994. After falling through the remainder of 1994-95, production grew steadily throughout 1995-96 then fell in each of the latest three quarters.
- In the March quarter 1997, the electricity, gas and water industry recorded growth in production levels. However, production for the manufacturing industry fell while the mining industry maintained production at the same level as for December quarter 1996.
- Production levels fell in seven of the nine manufacturing subdivisions. All falls were of 2% or less. Increases were experienced by the Textile, clothing, footwear and leather manufacturing industry (2.9%) and the Wood and paper product manufacturing industry (1.5%). The largest falls were Metal product manufacturing (2.0%), Other manufacturing (2.0%) and Petroleum, coal, chemical and associated product manufacturing (1.4%).

SEASONALLY ADJUSTED ESTIMATES

- The total industrial production estimate was 0.1% lower than December quarter 1996. Both the mining and manufacturing industries showed decreases.

INQUIRIES

- For further information about these and related statistics, contact Harvey Bissett on 06 252 5639, or any ABS Office.

NOTES

FORTHCOMING ISSUES

ISSUE (Quarter)	*RELEASE DATE*
June 1997	9 September 1997

CHANGES IN THIS ISSUE

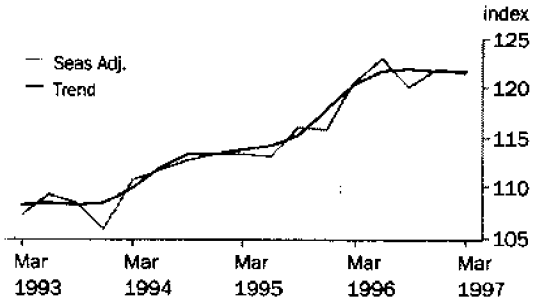
There are some changes in this issue as a result of data revisions to the quarterly indicator series of manufacturers sales and mining production. These revisions were generally small.

Dennis Trewin
Acting Australian Statistician

INDEX NUMBERS: BASE OF INDEX 1989–90 = 100.0

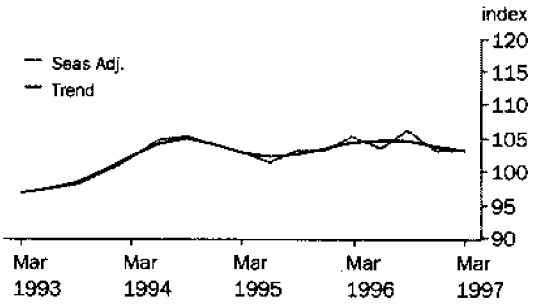
MINING

The March quarter 1997 trend estimate for production by the Mining industry shows no change from the December quarter 1996. Prior to the December quarter 1996, the industry experienced twelve successive quarters of growth. Production is 1.2% higher than March Quarter 1996 and 7.1% higher than March quarter 1995.



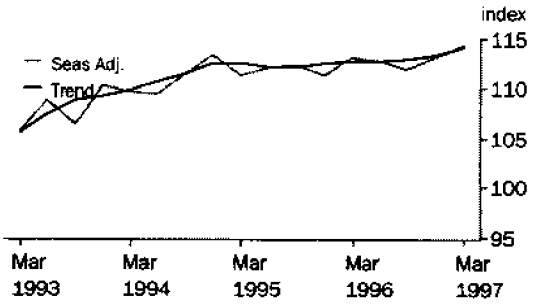
MANUFACTURING

The fall of 0.6% in the trend estimate of production by the Manufacturing industry was the third successive fall, following steady growth throughout 1995-96. Production in March quarter 1997 is 1.0% lower than March Quarter 1996 but 0.5% higher than March quarter 1995.



ELECTRICITY, GAS AND WATER

Trend estimates of production by the Electricity, gas and water industry show steady growth over the past six quarters. This growth was preceded by two quarters of falls. Production in March quarter 1997 is 1.2% higher than March Quarter 1996 and 1.3% higher than March quarter 1995.

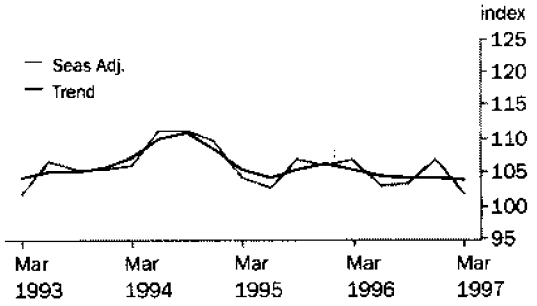


(a) At average 1989–90 prices

INDEX NUMBERS: BASE OF INDEX 1989–90 = 100.0

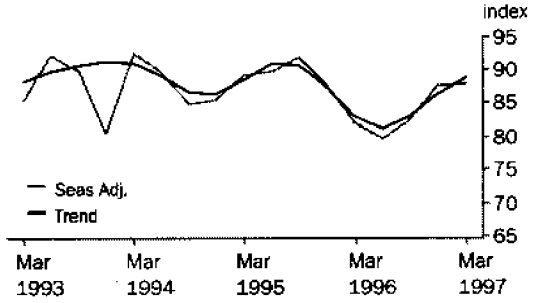
FOOD, BEVERAGE AND TOBACCO

The fall of 0.3% in the March quarter 1997 trend estimate is the fifth successive fall. Excepting only September and December quarters 1995 which each showed 1% growth, the trend for this industry has been falling since September quarter 1994. The March quarter 1997 trend estimate is 1.6% lower than March quarter 1996 and 1.5% lower than March quarter 1995.



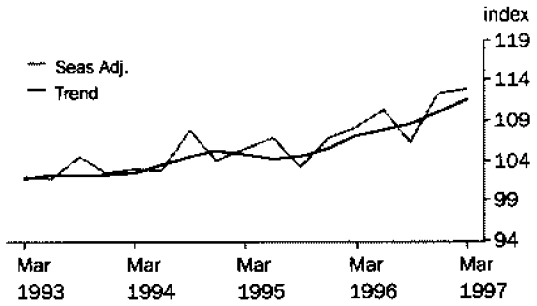
TEXTILE, CLOTHING, FOOTWEAR AND LEATHER

The rise of 2.9% in the March quarter 1997 trend estimate is the third successive rise. Over the last three years, this industry shows a decline to December quarter 1994, followed by growth to June quarter 1995, then decline to June quarter 1996 after which the latest growth began. The March quarter 1997 trend estimate is 6.9% higher than March quarter 1996 and 0.3% higher than March quarter 1995.



WOOD AND PAPER PRODUCT

The rise of 1.5% in the March quarter 1997 trend estimate is the seventh successive rise. Excepting only March and June quarters 1995 which each showed minor falls, the trend for this industry has been rising since September quarter 1993. The March quarter 1997 trend estimate is 4.4% higher than March quarter 1996 and 6.6% higher than March quarter 1995.

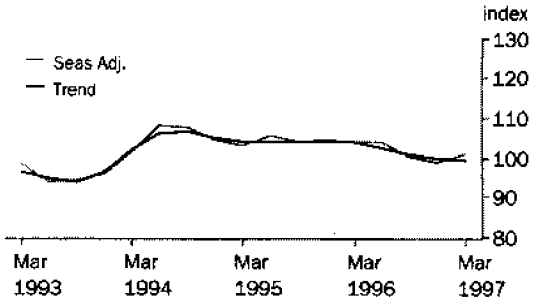


(a) At average 1989–90 prices

INDEX NUMBERS: BASE OF INDEX 1989–90 = 100.0

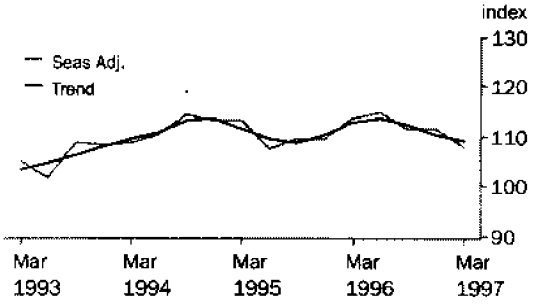
PRINTING, PUBLISHING AND RECORDED MEDIA

The fall of 0.5% in the March quarter 1997 trend estimate is the fifth successive fall and the seventh since the September quarter 1994. The March quarter 1997 trend estimate is 4.3% lower than March quarter 1996 and also 4.3% lower than March quarter 1995.



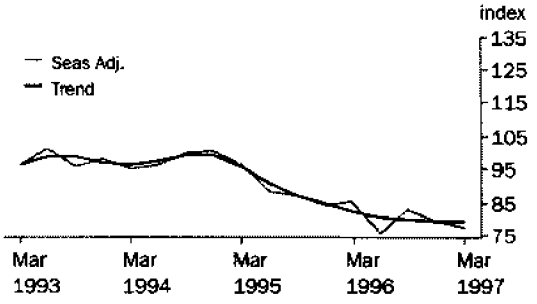
PETROLEUM, COAL, CHEMICAL AND ASSOCIATED PRODUCT

The fall of 1.4% in the March quarter 1997 trend estimate is the third successive fall following three quarters of growth. The March quarter 1997 trend estimate is 3.3% lower than March quarter 1996 and 2.3% lower than March quarter 1995.



NON-METALLIC MINERAL PRODUCT

The fall of 0.4% in the March quarter 1997 trend estimate is the tenth successive fall. However, the rate of decline in production levels appears to be slowing. The March quarter 1997 trend estimate is 4.2% lower than March quarter 1996 and 17.6% lower than March quarter 1995.

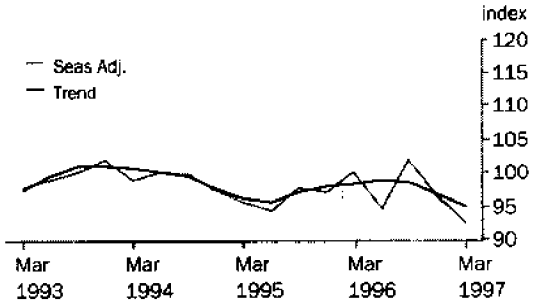


(a) At average 1989–90 prices

INDEX NUMBERS: BASE OF INDEX 1989–90 = 100.0

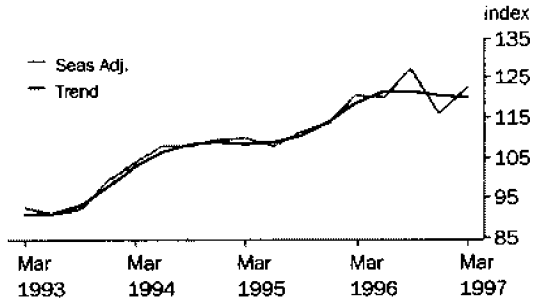
METAL PRODUCT

The fall of 2.0% in the March quarter 1997 trend estimate is the third successive fall following four quarters of growth. Prior to that were six successive quarters of falls. The March quarter 1997 trend estimate is 3.6% lower than March quarter 1996 and 1.2% lower than March quarter 1995.



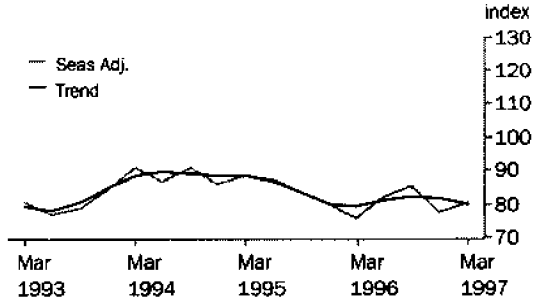
MACHINERY AND EQUIPMENT

The fall of 0.6% in the March quarter 1997 trend estimate is the second successive fall. Prior to December quarter 1996, the production trend rose consistently from June quarter 1993 (except for March quarter 1995 which showed a 0.1% fall). The March quarter 1997 trend estimate is 1.2% higher than March quarter 1996 and 10.4% higher than March quarter 1995.



OTHER MANUFACTURING

The fall of 2.0% in the March quarter 1997 trend estimate is the second successive fall. Excepting only June and September quarters 1996, the trend estimate has fallen consistently since June quarter 1994. The March quarter 1997 trend estimate is 0.8% higher than March quarter 1996 but 9.5% lower than March quarter 1995.



(a) At average 1989–90 prices

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				
March	107.2	96.8	107.6	**100.3**
June	111.9	103.1	108.2	**105.5**
1994-95				
September	117.7	107.2	115.7	**110.3**
December	111.8	109.0	112.3	**110.0**
March	110.1	97.8	109.5	**101.7**
June	113.4	99.8	111.0	**103.9**
1995-96				
September	121.1	105.1	116.5	**109.7**
December	114.0	107.6	110.0	**109.1**
March	117.0	100.5	111.2	**105.0**
June	123.3	101.8	111.7	**107.2**
1996-97				
September	125.3	108.3	116.2	**112.5**
December	120.0	107.9	111.9	**110.6**
March	118.1	98.2	112.4	**103.8**
		SEASONALLY ADJUSTED		
1993-94				
March	110.8	102.0	109.6	**104.7**
June	111.7	104.6	109.4	**106.6**
1994-95				
September	112.8	105.4	111.6	**107.6**
December	113.4	104.2	113.4	**107.2**
March	113.4	102.9	111.4	**106.1**
June	113.1	101.3	112.1	**105.0**
1995-96				
September	116.0	103.2	112.3	**106.9**
December	115.9	103.1	111.3	**106.6**
March	120.5	105.4	113.1	**109.2**
June	123.0	103.5	112.8	**108.4**
1996-97				
September	120.1	106.3	112.0	**109.6**
December	122.0	103.3	113.2	**108.1**
March	121.6	103.1	114.3	**108.0**
		TREND ESTIMATES		
1993-94				
March	109.8	102.3	109.8	**104.7**
June	111.9	104.2	110.7	**106.5**
1994-95				
September	113.3	104.9	111.6	**107.4**
December	113.4	104.1	112.5	**107.0**
March	113.7	102.8	112.6	**106.2**
June	114.2	102.1	112.2	**105.7**
1995-96				
September	115.3	102.6	112.1	**106.2**
December	117.8	103.5	112.5	**107.3**
March	120.3	104.3	112.7	**108.4**
June	121.8	104.8	112.8	**109.0**
1996-97				
September	122.0	104.6	112.9	**108.9**
December	121.8	103.9	113.3	**108.5**
March	121.8	103.3	114.1	**108.2**

(a) At average 1989–90 prices

(b) Base of index 1989–90 = 100.0

TOTAL INDUSTRIAL GROSS PRODUCT(a), Percentage Changes

Quarters	*Mining (excluding services to mining)*	*Total manufacturing*	*Electricity, gas and water*	***Total industrial***
		ORIGINAL		
1993-94				
March	2.3	–7.1	–1.6	**–4.6**
June	4.4	6.5	0.6	**5.2**
1994-95				
September	5.2	4.0	6.9	**4.5**
December	–5.0	1.7	–2.9	**–0.3**
March	–1.5	–10.3	–2.5	**–7.5**
June	3.0	2.0	1.4	**2.2**
1995-96				
September	6.8	5.3	5.0	**5.6**
December	–5.9	2.4	–5.6	**–0.5**
March	2.6	–6.6	1.1	**–3.8**
June	5.4	1.3	0.4	**2.1**
1996-97				
September	1.6	6.4	4.0	**4.9**
December	–4.2	–0.4	–3.7	**–1.7**
March	–1.6	–9.0	0.4	**–6.1**
		SEASONALLY ADJUSTED		
1993-94				
March	4.7	2.2	–0.7	**2.2**
June	0.8	2.5	–0.2	**1.8**
1994-95				
September	1.0	0.8	2.0	**0.9**
December	0.5	–1.1	1.6	**–0.4**
March	0.0	–1.2	–1.8	**–1.0**
June	–0.3	–1.6	0.6	**–1.0**
1995-96				
September	2.6	1.9	0.2	**1.8**
December	–0.1	–0.1	–0.9	**–0.3**
March	4.0	2.2	1.6	**2.4**
June	2.1	–1.8	–0.3	**–0.7**
1996-97				
September	–2.4	2.7	–0.7	**1.1**
December	1.6	–2.8	1.1	**–1.4**
March	–0.3	–0.2	1.0	**–0.1**
		TREND ESTIMATES		
1993-94				
March	1.3	2.3	0.5	**1.7**
June	1.9	1.9	0.8	**1.7**
1994-95				
September	1.3	0.7	0.8	**0.8**
December	0.1	–0.8	0.8	**–0.4**
March	0.3	–1.2	0.1	**–0.7**
June	0.4	–0.7	–0.4	**–0.5**
1995-96				
September	1.0	0.5	–0.1	**0.5**
December	2.2	0.9	0.4	**1.0**
March	2.1	0.8	0.2	**1.0**
June	1.2	0.5	0.1	**0.6**
1996-97				
September	0.2	–0.2	0.1	**–0.1**
December	–0.2	–0.7	0.4	**–0.4**
March	0.0	–0.6	0.7	**–0.3**

(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										
March	102.0	87.8	97.6	94.5	105.4	90.8	94.5	97.4	83.3	**96.8**
June	107.4	88.5	99.1	106.6	111.0	95.4	99.3	107.8	83.0	**103.1**
1994-95										
September	111.2	88.2	110.8	108.9	115.3	103.1	102.2	110.7	94.1	**107.2**
December	117.6	87.1	110.3	111.8	115.3	103.1	100.1	113.4	93.9	**109.0**
March	100.2	85.1	99.9	94.7	110.6	91.8	91.0	103.9	81.1	**97.8**
June	99.2	88.5	102.9	104.1	107.8	88.0	93.5	107.7	83.6	**99.8**
1995-96										
September	107.1	95.6	105.8	106.3	110.0	89.7	100.0	114.1	86.2	**105.1**
December	113.9	89.0	113.4	110.4	111.3	86.6	99.7	117.3	87.0	**107.6**
March	102.6	78.5	102.2	97.5	111.9	81.7	95.4	114.2	69.5	**100.5**
June	99.3	78.2	106.5	103.2	115.1	74.7	93.6	119.4	78.7	**101.8**
1996-97										
September	103.7	85.9	108.9	101.9	112.5	84.9	104.4	130.4	88.2	**108.3**
December	114.8	89.1	119.2	104.6	113.5	81.3	99.1	119.9	84.1	**107.9**
March	97.5	84.2	106.9	93.9	105.7	73.9	88.0	116.4	74.5	**98.2**
					SEASONALLY ADJUSTED					
1993-94										
March	105.9	92.6	103.0	101.5	108.7	95.5	99.0	103.7	91.1	**102.0**
June	111.3	89.7	102.8	108.1	110.5	96.3	100.0	107.8	86.7	**104.6**
1994-95										
September	111.2	84.9	107.9	107.4	114.4	100.1	99.8	108.2	90.6	**105.4**
December	109.6	85.5	103.9	104.4	113.4	100.6	97.5	109.6	86.1	**104.2**
March	104.3	89.2	105.5	103.0	113.4	96.2	95.5	109.9	88.4	**102.9**
June	102.8	89.9	106.8	105.3	107.5	88.7	94.3	108.1	87.1	**101.3**
1995-96										
September	106.9	91.9	103.1	103.9	109.6	87.4	97.6	111.6	83.2	**103.2**
December	106.1	87.5	106.8	104.4	109.7	84.4	96.9	113.4	79.9	**103.1**
March	107.0	82.2	108.0	103.8	113.7	85.5	100.1	120.5	75.4	**105.4**
June	103.0	79.6	110.3	104.2	114.9	75.5	94.6	120.1	82.1	**103.5**
1996-97										
September	103.3	82.5	106.2	100.3	111.7	82.7	101.8	127.5	85.4	**106.3**
December	106.8	87.8	112.3	99.1	111.8	79.2	96.3	116.0	77.3	**103.3**
March	101.8	88.1	112.9	100.8	107.9	77.3	92.4	122.6	80.6	**103.1**
					TREND ESTIMATES					
1993-94										
March	107.2	90.9	102.4	101.7	109.4	96.5	100.8	103.1	88.5	**102.3**
June	109.9	89.2	103.4	105.9	110.9	97.9	100.2	106.6	89.6	**104.2**
1994-95										
September	110.8	86.8	104.4	106.7	113.1	99.7	99.4	108.4	88.9	**104.9**
December	108.5	86.3	105.1	105.1	113.5	99.5	97.8	108.8	88.5	**104.1**
March	105.4	88.5	104.8	103.8	111.7	96.0	96.1	108.7	88.2	**102.8**
June	104.3	90.9	104.3	103.8	109.4	90.7	95.6	108.8	86.7	**102.1**
1995-96										
September	105.3	90.6	104.5	104.1	108.8	87.5	97.0	110.6	83.4	**102.6**
December	106.4	87.4	105.6	104.2	110.5	85.0	97.9	113.9	79.7	**103.5**
March	105.5	83.1	107.0	103.8	112.8	82.6	98.4	118.6	79.2	**104.3**
June	104.4	81.1	107.9	102.6	113.7	80.8	98.8	121.6	81.1	**104.8**
1996-97										
September	104.2	83.2	108.6	101.0	112.6	79.9	98.5	121.7	82.1	**104.6**
December	104.1	86.3	110.1	99.8	110.6	79.4	96.8	120.7	81.4	**103.9**
March	103.8	88.8	111.7	99.3	109.1	79.1	94.9	120.0	79.8	**103.3**

(a) At average 1989–90 prices

(b) Base of index 1989–90 = 100.0

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										
March	–9.7	6.6	–9.7	–6.4	–4.7	–9.9	–9.7	–5.2	–9.0	**–7.1**
June	5.3	0.8	1.5	12.8	5.3	5.1	5.1	10.7	–0.4	**6.5**
1994-95										
September	3.5	–0.3	11.8	2.2	3.9	8.1	2.9	2.7	13.4	**4.0**
December	5.8	–1.2	–0.5	2.7	0.0	0.0	–2.1	2.4	–0.2	**1.7**
March	–14.8	–2.3	–9.4	–15.3	–4.1	–11.0	–9.1	–8.4	–13.6	**–10.3**
June	–1.0	4.0	3.0	9.9	–2.5	–4.1	2.7	3.7	3.1	**2.0**
1995-96										
September	8.0	8.0	2.8	2.1	2.0	1.9	7.0	5.9	3.1	**5.3**
December	6.3	–6.9	7.2	3.9	1.2	–3.5	–0.3	2.8	0.9	**2.4**
March	–9.9	–11.8	–9.9	–11.7	0.5	–5.7	–4.3	–2.6	–20.1	**–6.6**
June	–3.2	–0.4	4.2	5.8	2.9	–8.6	–1.9	4.6	13.2	**1.3**
1996-97										
September	4.4	9.8	2.3	–1.3	–2.3	13.7	11.5	9.2	12.1	**6.4**
December	10.7	3.7	9.5	2.6	0.9	–4.2	–5.1	–8.1	–4.6	**–0.4**
March	–15.1	–5.5	–10.3	–10.2	–6.9	–9.1	–11.2	–2.9	–11.4	**–9.0**
					SEASONALLY ADJUSTED					
1993-94										
March	0.6	15.0	0.7	6.2	0.4	–2.9	–2.9	4.5	8.7	**2.2**
June	5.1	–3.1	–0.2	6.5	1.7	0.8	1.0	4.0	–4.8	**2.5**
1994-95										
September	–0.1	–5.4	5.0	–0.6	3.5	3.9	–0.2	0.4	4.5	**0.8**
December	–1.4	0.7	–3.7	–2.8	–0.9	0.5	–2.3	1.3	–5.0	**–1.1**
March	–4.8	4.3	1.5	–1.3	0.0	–4.4	–2.1	0.3	2.7	**–1.2**
June	–1.4	0.8	1.2	2.2	–5.2	–7.8	–1.3	–1.6	–1.5	**–1.6**
1995-96										
September	4.0	2.2	–3.5	–1.3	2.0	–1.5	3.5	3.2	–4.5	**1.9**
December	–0.7	–4.8	3.6	0.5	0.1	–3.4	–0.7	1.6	–4.0	**–0.1**
March	0.8	–6.1	1.1	–0.6	3.6	1.3	3.3	6.3	–5.6	**2.2**
June	–3.7	–3.2	2.1	0.4	1.1	–11.7	–5.5	–0.3	8.9	**–1.8**
1996-97										
September	0.3	3.6	–3.7	–3.7	–2.8	9.5	7.6	6.2	4.0	**2.7**
December	3.4	6.4	5.7	–1.2	0.1	–4.2	–5.4	–9.0	–9.5	**–2.8**
March	–4.7	0.3	0.5	1.7	–3.5	–2.4	–4.0	5.7	4.3	**–0.2**
					TREND ESTIMATES					
1993-94										
March	1.3	–0.5	0.3	5.5	1.3	–0.5	–0.2	5.3	4.9	**2.3**
June	2.5	–1.9	1.0	4.1	1.4	1.5	–0.6	3.4	1.2	**1.9**
1994-95										
September	0.8	–2.7	1.0	0.8	2.0	1.8	–0.8	1.7	–0.8	**0.7**
December	–2.1	–0.6	0.7	–1.5	0.4	–0.2	–1.6	0.4	–0.4	**–0.8**
March	–2.9	2.5	–0.3	–1.2	–1.6	–3.5	–1.7	–0.1	–0.3	**–1.2**
June	–1.0	2.7	–0.5	0.0	–2.1	–5.5	–0.5	0.1	–1.7	**–0.7**
1995-96										
September	1.0	–0.3	0.2	0.3	–0.5	–3.5	1.5	1.7	–3.8	**0.5**
December	1.0	–3.5	1.1	0.1	1.6	–2.9	0.9	3.0	–4.4	**0.9**
March	–0.8	–4.9	1.3	–0.4	2.1	–2.8	0.5	4.1	–0.6	**0.8**
June	–1.0	–2.4	0.8	–1.2	0.8	–2.2	0.4	2.5	2.4	**0.5**
1996-97										
September	–0.2	2.6	0.6	–1.6	–1.0	–1.1	–0.3	0.1	1.2	**–0.2**
December	–0.1	3.7	1.4	–1.2	–1.8	–0.6	–1.7	–0.8	–0.9	**–0.7**
March	–0.3	2.9	1.5	–0.5	–1.4	–0.4	–2.0	–0.6	–2.0	**–0.6**

(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.

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 recognized.

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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