

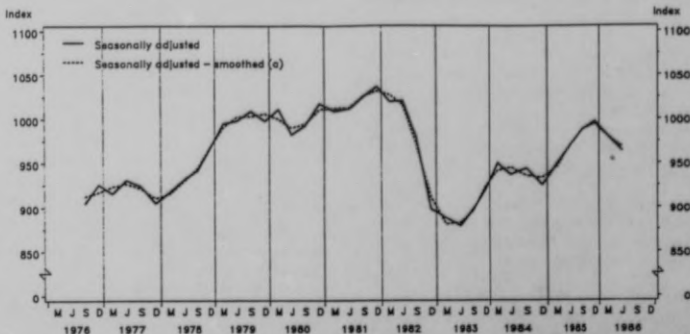


QUARTERLY INDEXES OF MANUFACTURING PRODUCTION, AUSTRALIA JUNE QUARTER 1986

- PHONE INQUIRIES**
- *about these statistics*—contact Paul Curran on Canberra (062) 52 6708 or any ABS State office.
 - *about other statistics and ABS services*— contact Information Services on Canberra (062) 52 6627 or any ABS State office.
- MAIL INQUIRIES**
- *write to Information Services, ABS, P.O. Box 10, Belconnen, A.C.T. 2616 or any ABS State office.*
- ON VIATEL**
- *key *656# for selected economic, social and demographic statistics on VIATEL.*

MAIN FEATURES

INDEX OF TOTAL MANUFACTURING GROSS PRODUCT AT AVERAGE 1979-80 PRICES
(BASE: 1979-80 = 1000)



(a) See paragraphs 14 to 17 of the Explanatory Notes.

Note: The following comments are based on seasonally adjusted, constant price data unless otherwise stated.

Preliminary estimates show that the index for total manufacturing production fell by 1.7 per cent in the June quarter 1986 following a similar drop in the March quarter 1986. Production is now at about the same level as in June 1985. In the latest quarter, five of the eight published groups declined. Fabricated metal products (down 6.7 per cent), Transport equipment (5.2 per cent) and Chemicals, petroleum and coal products (6.3 per cent) were largely responsible for the overall decline. In contrast Textiles, clothing and footwear rose 11.5 per cent (although from a depressed March level), Other

manufacturing showed a 1.5 per cent increase and Food, beverages and tobacco was up by 0.8 per cent.

Note: While the indexes of manufacturing production are based on data published in 'Stocks Owned by Private Enterprises in Selected Industries and Sales of Goods Manufactured by Private Manufacturing Enterprises, Australia' (5629.0), movements in the indexes will not necessarily be consistent with movements in these data because of differences in underlying concepts. For example, stocks of materials are excluded from the indexes of manufacturing production and there are different weighting patterns used in combining the sales data compared with those underlying the total manufacturers' sales estimates published in 5629.0.

EXPLANATORY NOTES

This publication presents quarterly estimates of constant price manufacturing production. The estimates are shown as index numbers and are derived mainly from estimates of manufacturers' sales and stocks. These indexes are subject to a number of limitations and qualifications which are discussed below. It is important to take these into account when using the statistics.

Scope of the estimates

2. The constant price value of manufacturing production is generally defined as the constant price gross product of all manufacturing establishments classified to Division C: Manufacturing, of the *Australian Standard Industrial Classification* (ASIC). The base year weights used in constructing the indexes in this publication have been derived from establishment data. However, the quarterly indicator series used relate to private manufacturing enterprises. The use of enterprise data means that the indexes have three important limitations as measures of manufacturing production:

- (a) changes in quarterly production by manufacturing establishments of non-manufacturing enterprises are not reflected in the indexes;
- (b) changes in a part of the quarterly production of non-manufacturing establishments of manufacturing enterprises are reflected in the indexes; and
- (c) changes in quarterly production by government bodies such as shipyards and railway workshops are not reflected in the indexes.

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

Comparability with other estimates

4. While the quarterly indexes in this publication can be viewed as an extension of those relating to the manufacturing sector in the annual publication *Australian National Accounts: Gross Product by Industry* (5211.0) it should be noted that the annual movements of the two sets of estimates will not necessarily be the same. The reason is that the data sources for the annual and quarterly series are largely independent of each other and are conceptually distinct. (The annual series are compiled using output data from the annual census of manufacturing establishments whereas the quarterly series draw on data relating to stocks held by and sales of goods manufactured by manufacturing enterprises.) Although the quarterly indexes have been constructed so as to minimise the impact of these differences in scope, significant differences remain between the quarterly and annual indexes.

5. The ABS publishes in a series of eight monthly and quarterly Production Bulletins (8357.0 to 8364.0) details of the quantities produced of about 600 manufacturing items. However, these items in total account for less than half of the output of the manufacturing sector, so that differences may occur between the general trends in those items and changes in the quarterly indexes of manufacturing production contained in this publication. The same comment applies to the Indexes of Quantity of Factory Production compiled by the ANZ Bank, which rely substantially on data published in 8357.0 to 8364.0. The comment applies with still greater force to preliminary details for approximately 30 production items published in the monthly publication *Production Statistics, Australia, Preliminary* (8301.0).

Concepts and definitions

6. The concepts, definitions and assumptions involved in calculating estimates of constant price gross product are given in detail in *Australian National Accounts: Concepts, Sources and Methods* (5216.0).

Derivation of the estimates

7. The estimates in this publication have been derived using the *gross output* method, i.e. gross product in the base year has been extrapolated by constant price estimates of output. A full description of the assumptions inherent in this methodology is contained in *Australian National Accounts: Concepts, Sources and Methods* (5216.0).

8. The measures of current price output underlying the indexes in this publication come mainly from estimates of manufacturers' sales and changes in stocks of finished goods and work-in-progress (published in aggregate in *Stocks Owned by Private Enterprises in Selected Industries and Sales of Goods Manufactured by Private Manufacturing Enterprises, Australia* (5629.0)). For two industry groupings (Printing and publishing, and Chemicals, petroleum and coal products) additional data are obtained for other selected income e.g. advertising revenue of printers and publishers, and commission revenue. All series have been adjusted to minimise discontinuities caused by sample revision and changes in industry of enterprise.

9. The component measures of constant price output are obtained by using price indexes to deflate the component current price estimates of sales, stocks, and other selected income.

10. The price indexes used to deflate current price sales are obtained from price data used in compiling the indexes published in *Price Indexes of Articles Produced by Manufacturing Industry, Australia* (6412.0) (APMI price indexes). The APMI indexes represent the price movements of commodities produced and sold by manufacturing establishments in each ASIC class. On the other hand, the current price sales figures are collected on a manufacturing enterprise basis. The price indexes for

each industry have been derived by combining the establishment-based APMI indexes according to turnover relationships from the 1979-80 integrated economic censuses.

11. Revaluation of stock levels is carried out largely using APMI-based price indexes. The constant price increase in stocks is then obtained as the difference between the closing and opening stock levels at constant prices. The 'other selected income' component is revalued using APMI price indexes.

12. A more detailed description of the methods used in compiling the estimates in this publication is contained in the June quarter 1983 issue of 5219.0.

Seasonal adjustment

13. 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. In interpreting particular seasonally adjusted statistics it is important to bear in mind 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 which are used are available on request.

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

15. 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. 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. 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 time series affected by revisions resulting from more recent data becoming available.

16. In this publication, the smoothed seasonally adjusted Index of Manufacturing Production has been derived by applying a 5-term Henderson-weighted moving average to the series. The weighting pattern for the final three values of the series is of the form shown below, where 'N' is the last quarter for which a value in the seasonally adjusted series is available.

5-TERM HENDERSON

Trend-cycle value for quarter	Weight given to seasonally adjusted values in quarter				
	N-4	N-3	N-2	N-1	N
N	0	0	-.073	.403	.670
N-1	0	-.073	.294	.522	.257
N-2	-.073	.294	.558	.294	-.073

17. While this technique enables smoothed data for recent quarters to be produced, it does result in revisions to the smoothed series for the most recent two quarters as additional observations become available. There may also be revisions as a result of changes in the original data, and as a result of the re-estimation of the seasonal factors. Details of other trend-cycle weighting patterns are available on request.

Reliability of estimates

18. Seasonally adjusted and constant price estimates are also subject to sampling variability. For seasonally adjusted estimates the standard errors in percentage terms closely approximate those for the unadjusted series. 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.

19. 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. In addition to the non-sampling errors which may occur in current price 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. Every effort is made to minimise non-sampling errors by careful design of forms, editing of data and efficient operating procedures.

Historical data

20. Data back to September quarter 1976 can be obtained by calling Mr Paul Curran on (062) 52 6708.

Related publications

21. Users may also wish to refer to the following publications:

Australian National Accounts: Gross Product by Industry, 1984-85 (5211.0)

Constant Price Estimates of Manufacturing Production, 1982-83 and 1983-84 (8211.0)

Price Indexes of Articles Produced by Manufacturing Industry, Australia (6412.0)—issued monthly

Stocks owned by Private Enterprises in Selected Industries and Sales of Goods Manufactured by Private Manufacturing Enterprises, Australia (5629.0)—issued quarterly

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

IAN CASTLES
Australian Statistician

TABLE 1 - PERCENTAGE CHANGE IN INDEXES OF MANUFACTURING GROSS PRODUCT AT AVERAGE 1979-80 PRICES BY INDUSTRY (A)
- SEASONALLY ADJUSTED

	FOOD, BEVERAGES AND TOBACCO	TEXTILES, CLOTHING AND FOOTWEAR	PAPER AND PRINTING (B)	CHEMICALS PETROLEUM AND COAL PRODUCTS (C)	BASIC METAL PRODUCTS (29)	TRANSPORT EQUIPMENT (32)	FABRICATED METAL PRODUCTS (D)	OTHER MANUFACTURING (E)	TOTAL MANUFACTURING (21-34)
	(21)	(23,24)	(26)	(27)	(29)	(32)	(31,33)	(25,28,34)	(21-34)
QUARTER									
1980-81									
SEP	1.2	4.4	0.4	-1.0	-	0.6	1.8	0.9	1.0
DEC	1.8	0.2	-1.9	-1.2	6.4	7.7	3.2	2.0	2.5
MAR	-4.7	-5.5	0.2	2.6	-3.6	6.0	1.1	-0.2	-0.9
JUN	-0.6	4.1	-0.4	-1.3	-2.2	4.3	-0.6	1.0	0.3
1981-82									
SEP	2.4	-1.3	-0.2	2.1	-1.7	4.1	-1.5	2.1	1.4
DEC	1.9	-0.5	1.5	0.8	-1.9	2.8	-0.1	3.2	1.1
MAR	-1.5	-1.7	-0.5	-5.8	-1.3	-2.3	0.1	-2.5	-1.6
JUN	3.6	-0.3	2.3	4.3	-1.8	-0.4	-1.9	-3.5	0.1
1982-83									
SEP	-	-1.0	-7.5	-4.3	-11.2	-7.9	-0.9	-5.9	-4.0
DEC	-3.1	-3.4	1.9	-4.6	-18.0	-16.1	-14.7	-6.0	-8.4
MAR	-0.2	-1.3	-0.6	-1.7	8.6	-5.9	-2.8	-2.8	-1.1
JUN	-3.5	0.5	-0.2	5.5	3.9	-6.7	-2.9	2.1	-1.0
1983-84									
SEP	-2.4	-0.3	5.8	4.5	7.6	11.7	-2.9	4.5	2.2
DEC	2.4	1.1	5.0	-0.5	-2.2	5.2	2.6	4.3	2.4
MAR	2.2	3.0	1.5	14.3	-0.9	3.9	1.3	4.9	3.3
JUN	-0.6	-2.6	0.9	-9.1	0.1	3.4	1.9	-6.6	-1.4
1984-85									
SEP	1.5	-3.2	-1.8	-1.8	1.5	1.2	0.5	4.0	0.7
DEC	-6.6	-1.1	-2.3	-1.7	4.1	0.5	0.1	-3.3	-2.0
MAR	5.2	-2.2	2.7	8.6	-8.2	3.8	4.4	1.8	2.6
JUN	1.6	10.8	2.3	-1.0	7.1	5.5	-0.2	-1.0	2.2
1985-86									
SEP	-0.4	-9.0	-0.8	-1.7	2.3	4.8	5.2	7.5	1.9
DEC	-2.8	9.2	6.0	2.4	5.3	-1.0	1.6	-3.2	0.9
MAR	3.4	-9.4	-4.4	3.8	-4.7	-7.2	0.4	-2.3	-1.6
JUN	0.8	11.5	-3.2	-6.3	-1.9	-5.2	-6.7	1.5	-1.7

(A) NUMBERS IN BRACKETS REFER TO ASIC SUBDIVISIONS. (B) PAPER, PAPER PRODUCTS, PRINTING AND PUBLISHING. (C) CHEMICALS, FERTILISERS, PAINTS, EXPLOSIVES, COSMETICS, OIL REFINING AND COAL PRODUCTS. (D) FABRICATED METAL PRODUCTS, OTHER INDUSTRIAL MACHINERY AND EQUIPMENT AND HOUSEHOLD APPLIANCES. (E) WOOD, WOOD PRODUCTS AND FURNITURE (EXCEPT SHEET METAL); GLASS, CLAY AND OTHER NON-METALLIC MINERAL PRODUCTS; LEATHER, RUBBER AND PLASTIC PRODUCTS AND OTHER MANUFACTURING N.E.C.

TABLE 2 - INDEXES OF MANUFACTURING GROSS PRODUCT AT AVERAGE 1979-80 PRICES BY INDUSTRY (A) - SEASONALLY ADJUSTED
(BASE: 1979-80 = 1000)

	FOOD, BEVERAGES AND TOBACCO	TEXTILES, CLOTHING AND FOOTWEAR	PAPER AND PRINTING (B)	CHEMICALS PETROLEUM AND COAL PRODUCTS (C)	BASIC METAL PRODUCTS (D)	TRANSPORT EQUIPMENT (E)	FABRICATED METAL PRODUCTS (F)	OTHER MANUFACTURING (G)	TOTAL MANUFACTURING (H)
	(21)	(23,24)	(26)	(27)	(29)	(32)	(31,33)	(25,28,34)	(21-34)
WEIGHT (F)	21.2%	6.9%	8.7%	7.0%	11.7%	10.0%	19.3%	15.2%	100.0%
QUARTER									
1980-81									
SEP	1027	1031	1010	969	923	897	1014	1021	993
DEC	1045	1033	991	957	982	966	1046	1041	1018
MAR	996	976	993	982	947	1024	1058	1039	1009
JUN	990	1016	989	969	926	1068	1052	1049	1012
1981-82									
SEP	1014	1003	987	989	910	1112	1068	1071	1026
DEC	1033	998	1002	997	893	1143	1067	1105	1037
MAR	1018	981	997	939	881	1117	1068	1077	1020
JUN	1055	978	1020	979	865	1113	1048	1039	1021
1982-83									
SEP	1055	968	943	937	768	1025	1039	978	980
DEC	1022	935	961	894	630	860	886	919	898
MAR	1020	923	955	879	684	809	861	893	888
JUN	984	928	953	927	711	755	836	912	879
1983-84									
SEP	960	925	1008	969	765	843	812	953	898
DEC	983	935	1058	964	748	887	833	994	920
MAR	1005	963	1074	1102	741	922	844	1043	950
JUN	999	938	1084	1002	742	953	860	974	937
1984-85									
SEP	1014	908	1064	984	753	964	864	1013	944
DEC	947	898	1040	967	784	969	865	980	925
MAR	996	878	1068	1050	720	1006	903	998	949
JUN	1012	973	1093	1040	771	1061	901	988	970
1985-86									
SEP	1008	885	1084	1022	789	1112	941	1062	988
DEC	980	966	1149	1047	831	1101	963	1028	997
MAR	1013	875	1099	1087	792	1022	967	1004	981
JUN	1021	976	1064	1019	777	969	902	1019	964

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(F) CONTRIBUTION OF EACH INDUSTRY TO TOTAL MANUFACTURING. SEE 'SCOPE OF THE ESTIMATES' IN THE EXPLANATORY NOTES.

TABLE 3 - INDEXES OF MANUFACTURING GROSS PRODUCT AT AVERAGE 1979-80 PRICES BY INDUSTRY (A)
(BASE: 1979-80 = 1000)

	FOOD, BEVERAGES AND TOBACCO	TEXTILES, CLOTHING AND FOOTWEAR	PAPER AND PRINTING (B)	CHEMICALS PETROLEUM AND COAL PRODUCTS (C)	BASIC METAL PRODUCTS (D)	TRANSPORT EQUIPMENT (E)	FABRICATED METAL PRODUCTS (F)	OTHER MANUFACTURING (G)	TOTAL MANUFACTURING
	(21)	(23,24)	(26)	(27)	(29)	(32)	(31,33)	(25,28,34)	(21-34)
WEIGHT (F)	21.2%	6.9%	8.7%	7.0%	11.7%	10.0%	19.3%	15.2%	100.0%
1980-81	1017	1016	996	969	945	985	1042	1038	1008
1981-82	1031	999	1002	977	888	1119	1063	1073	1027
1982-83	1022	948	953	910	700	866	908	927	913
1983-84	987	948	1057	1008	750	898	837	989	927
1984-85	992	924	1066	1009	758	998	883	995	947
1985-86	1006	934	1100	1043	797	1053	945	1029	984
QUARTER									
1980-81									
SEP	1037	1087	1047	974	963	954	1053	1069	1028
DEC	1135	1072	1030	984	990	1004	1111	1100	1071
MAR	949	875	929	929	903	875	965	938	930
JUN	946	1029	980	987	924	1105	1040	1044	1004
1981-82									
SEP	1023	1105	1022	1002	955	1193	1111	1117	1068
DEC	1122	1019	1040	1019	899	1181	1130	1170	1089
MAR	970	877	935	886	831	953	973	973	938
JUN	1009	996	1010	999	867	1149	1039	1033	1014
1982-83									
SEP	1064	1064	976	954	812	1112	1082	1019	1021
DEC	1110	951	998	909	630	882	935	974	942
MAR	971	827	895	829	639	689	785	807	817
JUN	943	951	945	947	719	779	832	906	874
1983-84									
SEP	966	1016	1043	992	810	921	845	994	936
DEC	1065	948	1059	972	747	904	878	1054	962
MAR	958	862	1008	1042	687	786	768	945	874
JUN	960	963	1077	1024	753	982	858	967	934
1984-85									
SEP	1021	999	1099	1009	800	1058	899	1056	985
DEC	1025	908	1079	972	782	984	911	1039	965
MAR	951	786	1002	994	668	860	822	903	873
JUN	971	1001	1085	1062	783	1091	900	981	967
1985-86									
SEP	1014	973	1121	1047	839	1221	986	1107	1032
DEC	1060	976	1192	1052	827	1118	1013	1090	1039
MAR	968	784	1030	1030	734	874	840	908	894
JUN	980	1004	1057	1042	791	998	941	1012	970

(A) NUMBERS IN BRACKETS REFER TO ASIC SUBDIVISIONS. (B) PAPER, PAPER PRODUCTS, PRINTING AND PUBLISHING. (C) CHEMICALS, FERTILISERS, PAINTS, EXPLOSIVES, COSMETICS, OIL REFINING AND COAL PRODUCTS. (D) FABRICATED METAL PRODUCTS, OTHER INDUSTRIAL MACHINERY AND EQUIPMENT AND HOUSEHOLD APPLIANCES. (E) WOOD, WOOD PRODUCTS AND FURNITURE (EXCEPT BRIST METAL); GLASS, CLAY AND OTHER NON-METALLIC MINERAL PRODUCTS; LEATHER, RUBBER AND PLASTIC PRODUCTS AND OTHER MANUFACTURING N.E.C. (F) CONTRIBUTION OF EACH INDUSTRY TO TOTAL MANUFACTURING. SEE 'SCOPE OF THE ESTIMATES' IN THE EXPLANATORY NOTES.