



AUSTRALIAN BUREAU OF STATISTICS

CANBERRA

CATALOGUE NO. 5219.0

DEPOSIT COPY
MAY NOT
BE BORROWED

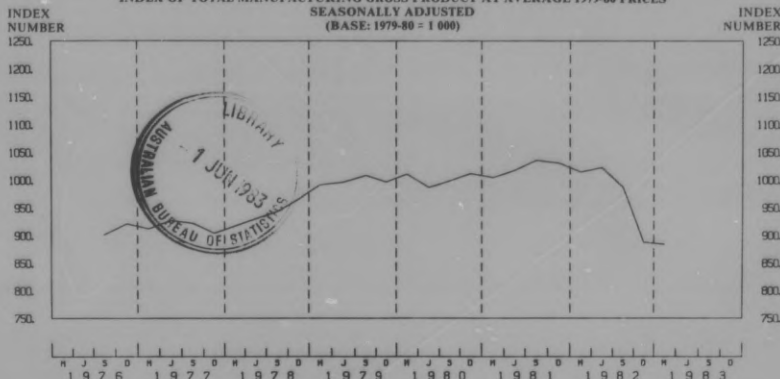
NOON 1 JUNE 1983

QUARTERLY INDEXES OF MANUFACTURING PRODUCTION, AUSTRALIA MARCH QUARTER 1983

PHONE INQUIRIES for more information about these statistics—contact Garth Parry on Canberra (062) 52 6708 or any of our State offices.
other inquiries including copies of publications—contact Information Services on Canberra (062) 52 6627 or in any of our State offices.

MAIL INQUIRIES write to Information Services, ABS, P.O. Box 10, Belconnen, A.C.T. 2616 or any of our State offices.

INDEX OF TOTAL MANUFACTURING GROSS PRODUCT AT AVERAGE 1979-80 PRICES
SEASONALLY ADJUSTED
(BASE: 1979-80 = 1 000)



MAIN FEATURES

In seasonally adjusted terms the index of constant price manufacturing production in March quarter 1983: declined by 0.5% from December quarter 1982; was 12.4% lower than for March quarter 1982; was the lowest recorded since the start of the series in September quarter 1976.

EXPLANATORY NOTES

This publication presents quarterly estimates of constant price manufacturing production. The estimates are presented as index numbers and are based mainly on currently published information concerning manufacturers' sales and stocks. By the application of appropriate weights, the indexes provide unduplicated estimates of total manufacturing production and of production by various manufacturing industry groupings. Although they facilitate the use of the currently available data, the indexes are subject to a number of limitations and qualifications which are discussed below. It is important to take these limitations 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

accord with this definition. However, the quarterly indicator series used relate to private manufacturing ENTERPRISES. The difference in scope of the base year weights and the quarterly indicator series means that the indexes have three important limitations as measures of manufacturing production:

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

(The concepts of 'establishment' and 'enterprise' are described in paragraph 21 below. A 'manufacturing establishment' is one predominantly engaged in manufacturing activity. Consequently manufacturing establishments may be engaged (but not predominantly) in non-manufacturing activity and conversely for non-manufacturing establishments. Similarly, a 'manufacturing enterprise' may include a number of non-manufacturing establishments some of which may be engaged in some manufacturing activity.)

3. The scope of the data used in the indicator series also differs from the general definition of manufacturing gross product. The enterprise stocks estimates used

include finished goods brought 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. Consideration has been given to the preparation of manufacturing production indexes using the monthly production data collected by the ABS. However, this option has not been pursued because of the limited coverage of the available data. The total number of manufacturing commodities produced is very large and to cover a substantial proportion of total manufacturing production would require the collection of information on a large number of individual commodities. This would be expensive for the Bureau and for respondents; in any case, for many commodities a sufficiently standard unit of quantity does not exist.

The concept of constant price gross product

6. The output of a producing unit, such as a factory, farm or shop, can be stockpiled or sold. Sales may be either to final consumers or to other producing units for further processing (intermediate consumption). Similarly, inputs to a producing unit may have been subject to prior processing by some other producing unit. If the values of all goods and services sold were added together, the total would involve duplication because some goods and services would be counted at several stages of production. The value of these intermediate goods and services must be deducted if the resulting total is to be free of such duplication. Gross product, or the value added by production, is the total market value of goods and services produced after deducting the cost of goods and services used up in the process of production but before deducting allowances for the consumption of fixed capital. Alternatively, gross product may be considered as the sum of all incomes (wages, profits, indirect taxes, etc.) and depreciation.

7. For purposes of general economic analysis, the only practicable way in which quantities of diverse goods and services produced (or used) can be aggregated is in terms of money values, such as the value of output or the value of materials used. However, changes in money values

may reflect nothing more than changes in the underlying prices. Therefore, for certain kinds of comparison over time, measures are required from which the direct effects of changes in prices have been removed. Such measures are described as being at constant prices. Although expressed in money terms, constant price measures vary only with changes in the quantities of the component goods and services. However, as explained in paragraph 8 below, the size of the movements in the constant price series is affected by the base year chosen.

8. Output (and intermediate input) at constant prices may be thought of as being derived by expressing the value of each component commodity produced (or used) as the product of a price and a quantity, and by substituting for each current price the corresponding price in the chosen base year. Aggregates at constant prices for each period are then obtained by summing constant price values for individual commodities. In effect, quantities of individual commodities are weighted by their prices in the base year—accordingly, the choice of base year influences the movements in the constant price series. The usefulness of such series is diminished if relative prices change significantly over time.

9. As was described in paragraph 6, gross product is the difference between the value of output and the value of intermediate input. Unlike the values of output and intermediate input, gross product can only be expressed in money value terms and cannot be defined and measured in terms of quantities and prices. Accordingly, it is not possible to estimate gross product at constant prices in a way strictly analogous to the estimation of output or intermediate input at constant prices. Rather, constant price gross product is defined as the difference between constant price output and constant price intermediate input.

10. In principle, the ideal method of estimating gross product at constant prices is the method implied by its definition: the difference between an estimate of constant price gross output and an estimate of constant price intermediate input. This method is commonly called the double deflation (or net output) method. In practice, data limitations are such that it is often necessary to depart from the double deflation method of estimating gross product at constant prices. In most cases where the double deflation method is not used the assumption is made that gross product at constant prices moves proportionately to either the value of output at constant prices (the gross output method) or to intermediate input at constant prices (the intermediate input method). Each of these assumptions is equivalent to the assumption that the ratio of intermediate input to output (both at constant prices) remains constant.

11. As mentioned above, although double deflation is the conceptually preferred method, the gross output or intermediate input method of revaluation may be the best estimation method available in practice. This will occur if there are serious deficiencies in either the input or output data available and if the ratio of intermediate

input to output (both at constant prices) is reasonably stable. The double deflation method is likely to be deficient in cases where gross product is small relative to output since the gross product measure is obtained as a difference. Small relative errors in the constant price estimates of output and/or intermediate input can have a large impact on the difference between them (i.e. on the estimate of gross product at constant prices).

12. In the absence of suitable alternative data, the estimates of production presented in this publication were obtained by using the gross output method.

Derivation of the estimates

13. The measures of current price output underlying the indexes of manufacturing production in this publication are based mainly on estimates of manufacturers' sales and changes in stocks of finished goods and work-in-progress obtained in an ABS survey of private manufacturing enterprises. Those estimates are 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 such as advertising revenue of printers and publishers, and commission revenue. The series have been adjusted to minimise discontinuities caused by sample revision and changes in industry of enterprise.

14. The measures of constant price output are obtained by using price indexes to revalue current price estimates of sales, stocks and other selected income.

15. The price indexes used to revalue 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. Consequently it was necessary to derive enterprise-based price indexes for each manufacturing industry. The relevant ASIC class establishment-based APMI price indexes have been combined according to the percentage contribution made by establishments classified to each manufacturing ASIC class to the turnover of enterprises in each industry. These percentage contributions were obtained using establishment and enterprise data from the 1979-80 integrated economic censuses.

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

Seasonal adjustment

17. 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 various seasonal adjustment methods which are used are given in *Seasonally Adjusted Indicators, Australia* (1308.0).

18. Particular care should be taken in interpreting quarter to quarter movements in the adjusted figures, especially for those items showing substantial irregular movement. It should be noted that seasonally adjusted figures necessarily reflect the sampling and other errors to which the original figures are subject (see paragraphs 19 and 20 below).

Reliability of estimates

19. 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 the corresponding current price estimates because of the sampling variability contained in the prices data used to deflate the current price estimates.

20. 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.

21. Description of terms

Establishment A unit covering all of the operations carried on under the ownership of a single enterprise at a single physical location.

Enterprise A unit comprising all of the operations in Australia of a single operating legal entity (e.g. company, sole proprietor, partnership). It may comprise one or more establishment(s).

Manufacturers' sales All sales of goods manufactured by a manufacturing enterprise, or manufactured for it on commission. Excludes commission earned by an enterprise for manufacturing work done on customers' materials and sales of goods not manufactured by the enterprise (e.g. merchanted goods).

Stocks All stocks of work-in-progress and finished goods owned by an enterprise, whether held at locations of the enterprise or elsewhere and including finished goods brought in (e.g. for resale).

Work-in-progress Includes processed or fabricated goods which will be further processed before sale by the enterprise.

Finished goods Goods ready for sale by the enterprise, including goods purchased for resale without further processing and all other stocks. Excludes completed development projects intended for sale and completed buildings intended for sale, rental or lease.

ASIC Australian Standard Industrial Classification.

Related publications

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

Australian National Accounts: Gross Product by Industry, 1980-81 (5211.0)

Integrated Economic Censuses: Enterprise Statistics, Details by Industry Class, Australia, 1979-80 (8103.0)

Constant Price Estimates of Manufacturing Production, 1980-81 (8211.0)

Manufacturing Establishments, Details of Operations by Industry Class, Australia, 1980-81 (8203.0)

Manufacturing Commodities, Principal Articles Produced, 1980-81 (8303.0)

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.

23. 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.

R. J. CAMERON
Australian Statistician

TABLE 1 - INDEXES OF MANUFACTURING GROSS PRODUCT AT AVERAGE 1979-80 PRICES BY INDUSTRY (A)
(BASE: 1979-80 = 1000)

WEIGHT (F)	ORIGINAL SERIES									SEASONALLY ADJUSTED SERIES
	FOOD, BEVERAGES AND TOBACCO	TEXTILES, CLOTHING AND FOOTWEAR	PAPER AND PRINTING	CHEMICALS, PETROLEUM AND COAL PRODUCTS	BASIC METAL PRODUCTS	TRANSPORT EQUIPMENT	FABRICATED METAL PRODUCTS	OTHER MANUFACTURING	TOTAL MANUFACTURING	TOTAL MANUFACTURING
	(21)	(23,24)	(B) (26)	(C) (27)	(29)	(32)	(D) (31,33)	(E) (25,28,34)	(21-34)	(21-34)
1976-77	22.5%	6.5%	8.2%	10.4%	11.3%	8.6%	18.2%	14.3%	100.0%	
1977-78	946	1054	868	832	820	958	904	956	915	
1978-79	980	984	878	845	823	881	914	972	918	
1979-80	1006	1029	947	918	922	1024	942	1001	973	
1980-81	1000	1000	1000	1000	1000	1000	1000	1000	1000	
1981-82	1015	1016	996	969	945	986	1043	1038	1007	
1981-82	1030	998	1004	977	889	1104	1063	1073	1023	
QUARTER										
1976-77										
SEP	1008	1162	912	862	860	1026	954	1015	971	921
MAR	903	933	814	801	748	829	843	859	846	912
JUN	949	981	865	868	832	983	909	958	919	927
1977-78										
SEP	1003	1040	911	807	835	949	935	1034	946	922
DEC	1053	1002	909	863	809	851	983	1012	954	904
MAR	937	881	811	826	808	776	798	847	845	917
JUN	928	1014	880	884	838	948	941	993	928	930
1978-79										
SEP	986	1087	943	915	873	986	941	1041	969	943
DEC	1102	1049	976	928	929	1027	1006	1048	1019	965
MAR	975	952	894	875	922	934	861	925	919	991
JUN	959	1029	976	955	963	1149	960	990	986	996
1979-80										
SEP	1009	1038	1031	940	1056	1127	1038	1079	1036	1008
DEC	1062	1058	1012	1088	1001	1122	1062	1014	1052	996
MAR	962	907	959	977	1027	823	918	899	938	1010
JUN	968	997	998	995	916	927	981	1008	974	986
1980-81										
SEP	1035	1089	1047	974	963	956	1053	1069	1026	998
DEC	1133	1072	1030	986	989	1004	1112	1100	1069	1011
MAR	948	875	929	931	903	878	964	940	930	1004
JUN	945	1029	979	986	925	1105	1041	1043	1001	1012
1981-82										
SEP	1021	1102	1024	1002	956	1177	1111	1117	1061	1031
DEC	1121	1019	1044	1019	899	1164	1132	1169	1085	1025
MAR	969	876	936	887	831	937	973	973	935	1009
JUN	1010	995	1011	1000	869	1139	1036	1031	1011	1024
1982-E3										
SEP	1063	1065	976	953	805	1098	1084	1019	1016	988
DEC	1113	945	992	911	620	873	933	972	942	888
MAR	970	805	891	831	638	691	800	792	820	884

(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. (F) CONTRIBUTION OF EACH INDUSTRY TO TOTAL MANUFACTURING. SEE PARAGRAPH 2 OF THE EXPLANATORY NOTES.

TABLE 2 - PERCENTAGE CHANGE IN INDEXES OF MANUFACTURING GROSS PRODUCT AT AVERAGE 1979-80 PRICES BY INDUSTRY (A)

	ORIGINAL SERIES									SEASONALLY ADJUSTED SERIES
	FOOD, BEVERAGES AND TOBACCO	TEXTILES, CLOTHING AND FOOTWEAR	PAPER AND PRINTING (B)	CHEMICALS, PETROLEUM AND COAL PRODUCTS (C)	BASIC METAL PRODUCTS (D)	TRANSPORT EQUIP- MENT (E)	FABRICATED METAL PRODUCTS (F)	OTHER MANUFAC- TURING (G)	TOTAL MANUFAC- TURING (H)	TOTAL MANUFAC- TURING (I)
	(21)	(23,24)	(26)	(27)	(29)	(32)	(31,33)	(25,28,34)	(21-34)	(21-34)
1977-78	3.6	-6.6	1.2	1.6	0.4	-8.0	1.1	1.7	0.3	
1978-79	2.7	4.6	7.9	8.6	12.0	16.2	3.1	3.0	6.0	
1979-80	-0.6	-2.8	5.6	8.9	8.5	-2.3	6.2	-0.1	2.8	
1980-81	1.5	1.6	-0.4	-3.1	-5.5	-1.4	4.3	3.8	0.7	
1981-82	1.5	-1.8	0.8	0.8	-5.9	12.0	1.9	3.4	1.6	
QUARTER										
1976-77										
MAR	-10.4	-19.7	-10.7	-7.1	-13.0	-19.2	-11.6	-15.4	-12.9	-1.0
JUN	5.1	5.1	6.3	8.4	11.2	18.6	7.8	11.5	8.6	1.6
1977-78										
SEP	5.7	6.0	5.3	-7.0	0.4	-3.5	2.9	7.9	2.9	-0.5
DEC	5.0	-3.7	-0.2	6.9	-3.1	-10.3	5.1	-2.1	0.8	-2.0
MAR	-11.0	-12.1	-10.8	-4.3	-0.1	-8.8	-18.8	-16.3	-11.4	1.4
JUN	-1.0	15.1	8.5	7.0	3.7	22.2	17.9	17.2	9.8	1.4
1978-79										
SEP	6.3	7.2	7.2	3.5	4.2	4.0	..	4.8	4.4	1.4
DEC	11.8	-3.5	3.5	1.4	4.2	4.2	6.9	0.7	5.2	2.3
MAR	-11.5	-9.2	-8.4	-5.7	-0.8	-9.1	-14.4	-11.7	-9.8	2.7
JUN	-1.6	8.1	9.2	9.1	4.4	23.0	11.5	7.0	7.3	0.5
1979-80										
SEP	5.2	0.9	5.6	-1.6	9.7	-1.9	8.1	9.0	5.1	1.2
DEC	5.3	1.9	-1.8	15.7	-5.2	-0.4	2.3	-6.1	1.5	-1.2
MAR	-9.4	-14.3	-5.2	-10.2	2.6	-26.6	-13.6	-11.1	-10.8	1.4
JUN	0.6	9.9	4.1	1.8	-10.8	12.6	6.9	12.1	3.8	-2.4
1980-81										
SEP	6.9	9.2	4.9	-2.1	5.1	3.1	7.3	6.1	5.3	1.2
DEC	9.5	-1.6	-1.6	1.2	2.7	5.0	5.6	2.9	4.2	1.3
MAR	-16.3	-18.4	-9.8	-5.6	-8.7	-12.5	-13.3	-14.5	-13.0	-0.7
JUN	-0.3	17.6	5.4	5.9	2.4	25.9	8.0	11.0	7.6	0.8
1981-82										
SEP	8.0	7.1	4.6	1.6	3.4	6.5	6.7	7.1	6.0	1.9
DEC	9.8	-7.5	2.0	1.7	-6.0	-1.1	1.9	4.7	2.3	-0.6
MAR	-13.6	-14.0	-10.3	-13.0	-7.6	-19.5	-14.0	-16.8	-13.8	-1.6
JUN	4.2	13.6	8.0	12.7	4.6	21.6	6.5	6.0	8.1	1.5
1982-83										
SEP	5.2	7.0	-3.5	-4.7	-7.4	-3.6	4.6	-1.2	0.5	-3.5
DEC	4.7	-11.3	1.6	-4.4	-23.0	-20.5	-13.9	-4.6	-7.3	-10.1
MAR	-12.8	-14.8	-10.2	-8.8	2.9	-20.8	-14.3	-18.5	-13.0	-0.5

(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.