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QUARTERLY INDEXES OF MANUFACTURING PRODUCTION, AUSTRALIA SEPTEMBER QUARTER 1983

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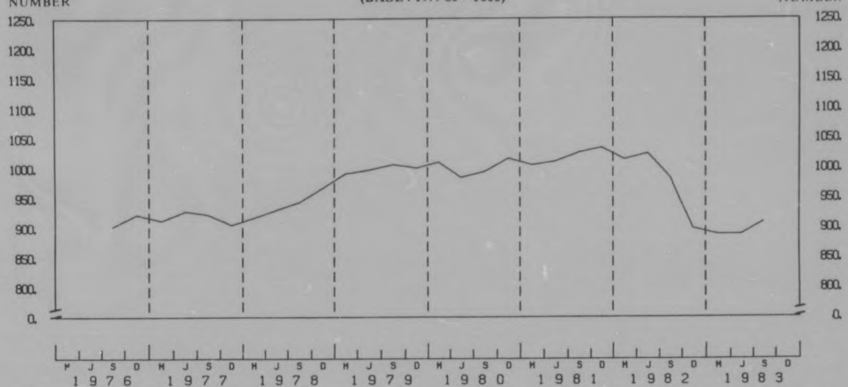
INDEX OF TOTAL MANUFACTURING GROSS PRODUCT AT AVERAGE 1979-80 PRICES
SEASONALLY ADJUSTED
(BASE : 1979-80 = 1000)



MAIN FEATURES

The following comments are based on seasonally adjusted data, unless otherwise stated.

The overall index of manufacturing production rose by 2.4 per cent in September quarter 1983, the first increase since June quarter 1982. Increases in activity were recorded in most of the component industry groups, providing signs of a recovery in manufacturing. However, the moderate overall improvement brought the level of the total manufacturing index to only marginally above that recorded in December quarter 1977. When interpreting the September quarter movement, it is useful to examine the index in conjunction with estimates of manufacturers' stocks and sales in recent quarters (see ABS publication catalogue no 5629.0). This suggests the following pattern:

> **There was a major fall in demand during the second half of 1982, with constant price manufacturers' sales falling by 12 per cent between the June and December quarters.**
>
> **The sudden sizeable drop in demand was not reflected in reduced production until December quarter 1982. Thus, in the short term, there were abnormally high levels of stockholdings. The manufacturing constant price stocks/sales ratios for recent quarters are:**

Quarter ended	Ratio
1982—	
March	0.800
June	0.793
September	0.835
December	0.880
1983—	
March	0.846
June	0.788
September	0.770

Demand improved moderately during early 1983 but, initially, was satisfied by a rundown in the very high levels of stocks held. However, stockholdings were reduced to below normal levels as demand strengthened, with manufacturers increasing production in September quarter 1983.

The transport equipment component of the index climbed sharply in September quarter 1983 (21.7 per cent over June quarter 1983). This was the largest single influence on the increase in the index for total manufacturing production, contributing 1.7 percentage points of the overall growth of 2.4 per cent. Despite the strength of the increase in transport equipment in September quarter 1983, the level of production in this area is still 12 per cent below that of September 1982 and nearly 19 per cent lower than in September 1981.

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.

Changes in this issue

2. Seasonally adjusted component series are published for the first time in this issue and show the composition of the increase in production in September quarter 1983, as well as providing additional data for an analysis of the fall that occurred in 1982-83. The total seasonally adjusted series has been revised as a result of the annual seasonal reanalysis.

Scope of the estimates

3. 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.

4. 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

5. 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.

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 given in *Seasonally Adjusted Indicators, Australia* (1308.0).

14. Particular care should be taken in interpreting quarterly movements in the seasonally 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 15 and 16 below).

Reliability of estimates

15. 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.

16. 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.

Related publications

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

Australian National Accounts: Gross Product by Industry, 1981-82 (5211.0)

Constant Price Estimates of Manufacturing Production, 1980-81 (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.*

18. 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.

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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 (21)	TEXTILES, CLOTHING AND FOOTWEAR (23,24)	PAPER AND PRINTING (B) (26)	CHEMICALS, PETROLEUM AND COAL PRODUCTS (C) (27)	BASIC METAL PRODUCTS (29)	TRANSPORT EQUIP-MENT (32)	FABRICATED METAL PRODUCTS (D) (31,33)	OTHER MANUFAC-TURING (E) (25,28,34)	TOTAL MANUFAC-TURING (21-34)
QUARTER									
1976-77									
JUN	5.2	-5.1	-0.2	2.3	8.7	-2.2	0.3	0.4	1.8
1977-78									
SEP	0.2	0.6	0.8	-5.0	-2.5	-3.0	-1.5	2.4	-0.6
DEC	-2.3	-2.7	-0.8	2.7	-2.7	-10.1	1.2	-1.6	-1.8
MAR	0.7	2.0	-0.1	3.2	4.8	9.9	-0.8	-2.6	1.3
JUN	-0.8	3.6	2.0	1.2	1.4	0.9	0.2	5.6	1.4
1978-79									
SEP	0.7	1.8	2.5	5.5	0.7	3.9	-0.1	-0.3	1.4
DEC	3.9	-2.5	3.1	-2.2	7.5	4.8	3.1	0.8	2.5
MAR	0.3	5.4	2.1	1.4	4.0	9.6	..	2.6	2.5
JUN	-1.4	-3.2	2.7	3.6	2.0	1.9	3.6	-3.2	0.6
1979-80									
SEP*	-0.6	-4.1	1.0	-0.7	5.7	-2.8	3.0	3.8	0.9
DEC	-2.1	3.4	-2.0	12.7	-3.7	0.7	-0.9	-6.4	-0.6
MAR	3.0	-0.4	5.3	-3.6	7.9	-11.6	0.9	3.3	1.0
JUN	0.9	-2.2	-1.9	-3.2	-13.7	-6.6	-0.7	1.5	-2.6
1980-81									
SEP	0.7	4.1	0.4	-1.9	1.1	1.5	1.8	1.1	1.0
DEC	2.0	-0.1	-1.8	-0.7	5.6	6.7	2.9	2.2	2.2
MAR	-4.8	-5.0	..	1.1	-4.2	5.8	1.1	-0.4	-1.1
JUN	..	4.1	-0.5	0.8	-1.8	4.3	0.1	0.6	0.6
1981-82									
SEP	1.5	-2.0	0.2	1.3	-0.3	5.7	1.0	2.4	1.5
DEC	2.3	-0.6	1.8	0.2	-2.7	0.8	-0.3	3.3	0.8
MAR	-1.4	-0.9	-0.9	-6.8	-2.9	-2.1	0.1	-2.6	-1.9
JUN	4.4	-0.2	2.2	7.1	-1.1	0.6	-1.3	-4.0	1.0
1982-83									
SEP	-1.2	-2.0	-7.5	-4.7	-9.0	-7.1	-1.0	-5.4	-4.0
DEC	-2.8	-3.8	2.0	-6.0	-19.4	-18.0	-15.6	-6.0	-8.6
MAR	..	0.8	-0.7	-2.7	6.2	-6.1	-2.0	-2.9	-1.1
JUN	-2.8	0.6	0.1	8.6	6.0	-6.0	-2.0	1.6	..
1983-84									
SEP	-4.2	-2.2	1.5	3.7	5.2	21.6	1.9	4.0	2.4

(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 (21)	TEXTILES, CLOTHING AND FOOTWEAR (23,24)	PAPER AND PRINTING (B) (26)	CHEMICALS, PETROLEUM AND COAL PRODUCTS (C) (27)	BASIC METAL PRODUCTS (29)	TRANSPORT EQUIPMENT (32)	FABRICATED METAL PRODUCTS (D) (31,33)	OTHER MANUFACTURING (E) (25,28,34)	TOTAL MANUFACTURING (21-34)
WEIGHT (F)	22.5%	6.5%	8.2%	10.4%	11.3%	8.6%	18.2%	14.3%	100.0%
QUARTER									
1976-77									
JUN	993	980	872	855	838	938	922	959	928
1977-78									
SEP	995	986	879	812	817	910	908	982	922
DEC	972	959	872	834	795	818	919	966	905
MAR	979	978	871	861	833	899	912	941	917
JUN	971	1013	888	871	845	907	914	994	930
1978-79									
SEP	978	1031	910	919	851	942	913	991	943
DEC	1016	1005	938	899	915	987	941	999	967
MAR	1019	1059	958	912	952	1082	941	1025	991
JUN	1005	1025	984	945	971	1103	975	992	997
1979-80									
SEP	999	983	994	938	1026	1072	1004	1030	1006
DEC	978	1016	974	1057	988	1080	995	964	1000
MAR	1007	1012	1026	1019	1066	955	1004	996	1010
JUN	1016	990	1006	986	920	892	997	1011	984
1980-81									
SEP	1023	1031	1010	967	930	905	1015	1022	994
DEC	1043	1030	992	960	982	966	1044	1044	1016
MAR	993	979	992	971	941	1022	1056	1040	1005
JUN	993	1019	987	979	924	1066	1057	1046	1011
1981-82									
SEP	1008	999	989	992	921	1127	1068	1071	1026
DEC	1031	993	1007	994	896	1136	1065	1106	1034
MAR	1017	984	998	926	870	1112	1066	1077	1014
JUN	1062	982	1020	992	860	1119	1052	1034	1024
1982-83									
SEP	1049	962	943	945	783	1040	1042	978	983
DEC	1020	925	962	888	631	853	879	919	898
MAR	1020	932	955	864	670	801	861	892	888
JUN	991	938	956	938	710	753	844	906	888
1983-84									
SEP	949	917	970	973	747	916	860	942	909

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

	FOOD, BEVERAGES AND TOBACCO (21)	TEXTILES, CLOTHING AND FOOTWEAR (23,24)	PAPER AND PRINTING (B) (26)	CHEMICALS, PETROLEUM AND COAL PRODUCTS (C) (27)	BASIC METAL PRODUCTS (29)	TRANSPORT EQUIP-MENT (32)	FABRICATED METAL PRODUCTS (D) (31,33)	OTHER MANUFAC-TURING (E) (25,28,34)	TOTAL MANUFAC-TURING (21-34)
WEIGHT (F)	22.5%	6.5%	8.2%	10.4%	11.3%	8.6%	18.2%	14.3%	100.0%
1976-77	946	1053	867	832	820	959	904	956	916
1977-78	980	985	878	845	822	881	914	971	919
1978-79	1005	1030	947	918	922	1025	942	1001	974
1979-80	1000	1000	1000	1000	1000	1000	1000	1000	1000
1980-81	1015	1016	996	968	945	986	1042	1038	1007
1981-82	1030	998	1004	976	888	1122	1063	1072	1025
1982-83	1022	948	954	909	700	864	909	925	916
QUARTER									
1976-77									
JUN	949	981	865	868	832	983	909	958	920
1977-78									
SEP	1003	1040	911	807	835	949	935	1034	946
DEC	1053	1002	909	863	809	851	983	1012	955
MAR	937	881	811	826	808	777	798	847	845
JUN	928	1014	880	884	838	948	941	993	929
1978-79									
SEP	986	1087	943	915	873	986	941	1041	969
DEC	1102	1049	976	928	929	1027	1007	1048	1020
MAR	975	952	894	875	922	933	861	925	919
JUN	959	1029	976	955	963	1150	960	990	987
1979-80									
SEP	1009	1038	1031	940	1056	1127	1038	1079	1037
DEC	1062	1058	1012	1088	1001	1123	1063	1014	1053
MAR	962	907	959	977	1027	823	918	899	937
JUN	968	997	998	995	916	927	981	1008	974
1980-81									
SEP	1035	1089	1047	974	963	956	1053	1069	1026
DEC	1133	1072	1030	986	989	1004	1112	1100	1069
MAR	948	875	929	931	903	878	964	940	930
JUN	945	1029	979	986	925	1105	1041	1043	1001
1981-82									
SEP	1021	1102	1024	1002	956	1196	1111	1117	1063
DEC	1120	1019	1044	1019	899	1181	1132	1169	1088
MAR	969	876	936	887	831	952	973	973	937
JUN	1010	995	1011	1000	866	1159	1036	1031	1014
1982-83									
SEP	1063	1062	976	955	813	1106	1085	1019	1019
DEC	1110	948	998	910	632	887	933	972	946
MAR	971	828	896	828	638	685	786	805	821
JUN	943	952	948	946	719	780	832	904	879
1983-84									
SEP	963	1013	1004	983	776	976	895	981	943

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