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**RESEARCH AND EXPERIMENTAL
DEVELOPMENT
BUSINESS ENTERPRISES
AUSTRALIA**

1981-82

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**RESEARCH AND EXPERIMENTAL
DEVELOPMENT**

**BUSINESS ENTERPRISES
AUSTRALIA
1981-82**

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PREFACE

This publication presents statistics on research and experimental development (R & D) compiled from data collected from a survey of business enterprises in Australia in respect of 1981-82. The survey was conducted by the ABS and forms part of the Department of Science and Technology's Project SCORE (Survey and Comparisons of Research Expenditures). The main purpose of Project SCORE is to measure the financial and manpower resources devoted to Australian R & D.

Comparable information is collected and compiled by the ABS for the General Government, Private Non-profit and Higher Education Sectors. Preliminary results for the Business Enterprise and General Government Sectors were published in April and October 1983 respectively. Comprehensive results for the Higher Education Sector (in respect of calendar year 1981) and the General Government Sector were published in October 1983 and January 1984 respectively. Results for the private Non-profit Sector together with the All Sector Summary are expected to be published in March 1984. More detailed information is available upon request.

Previous Project SCORE surveys were conducted for 1968-69, 1973-74, 1976-77 and 1978-79.

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MAIN FEATURES

The estimate of expenditure on R & D carried out in Australia by business enterprises during 1981-82 was \$341m at *current* prices. This represents a 39% increase in expenditure compared with 1978-79. At constant (average 1979-80) prices R & D expenditure is estimated to have decreased by 2% between these years.

Expenditure by private enterprises was \$286m and by public sector business enterprises was \$55m at *current* prices. At *constant* (average 1979-80) prices this represents a 4% decrease in R & D expenditure by private enterprises and a 3% increase by public sector business enterprises.

The manpower effort devoted to R & D carried out in Australia by business enterprises during 1981-82 was 7,923 man years. This represents a decrease of 8% compared with 1978-79.

Payments for technical know-how by business enterprises in Australia in 1981-82 were \$127m (an increase of 17% at *current* prices, compared with 1978-79). *Receipts* for technical know-how by business enterprises in Australia in 1981-82 were \$17m (an increase of 13% at *current* prices compared with 1978-79).

EXPLANATORY NOTES

Introduction

This publication presents revised statistics on the level and distribution of expenditure and manpower resources devoted to research and experimental development (R & D) carried out in Australia by business enterprises during 1981-82. (Tables 1 to 13) they replace the preliminary estimates previously published on 5 April 1983. These statistics do not measure directly the amount of R & D activity *funded* by business enterprises, nor the amount of R & D activity carried out on account of business enterprises. An approximate indication of these two measures can however be derived from the statistics of source of funds for R & D carried out by business enterprises (Tables 4 and 9) and the statistics of extramural R & D funded by business enterprises but carried out by other organisations (Tables 14 and 15).

2. Statistics of payments and receipts for technical know-how by business enterprises are shown in Tables 16 to 20. They can be considered as providing an indication of the value of purchases and sales of knowledge arising from previous R & D activity.

3. Statistics of patent applications by, and patents granted to, business enterprises with R & D activity are shown in Table 21. These figures might be regarded as providing an imperfect indication of the volume of output of the R & D process.

Data sources

4. Most of the statistics presented in this publication were derived from data collected from business enterprises in the Survey of Research and Experimental Development in respect of the year ended 30 June 1982. This survey was conducted by the ABS, by means of mailed questionnaires, and a 99% response was obtained.

5. The 1973-74 statistics shown in Table 1 and 1976-77 and 1978-79 statistics shown in other tables were derived from similar surveys conducted by the ABS. A number of revisions have been made to the 1973-74, 1976-77 and 1978-79 statistics since they were first published.

6. The statistics of value added and turnover shown in Tables 3 and 6 to 8 were obtained from the ABS Mining and Manufacturing Censuses for 1981-82. These censuses were also the source of the majority of data on the number of enterprises and persons employed relating to the whole industry (as opposed to R & D performers only) used in the calculation of the two R & D intensity measures shown in the last two columns of Table 3. The data used to calculate the intensities for enterprises other than mining and manufacturing were obtained within the ABS from a variety of sources.

Definitions

7. *Research and experimental development* is defined in accordance with the Organisation for Economic Co-operation and Development (OECD) standard as comprising 'creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications'.

8. To be classified as R & D, an activity should contain an appreciable amount of novelty or innovation, should have investigation as a primary objective, and should have a potential to produce results that recognisably increase mankind's stock of knowledge. The concept of novelty is not associated with the actual creation of something which, although new, is made by artistry or by application of techniques that have already been established for that class of object. R & D activity extends to substantial modifications to existing products or processes. R & D ceases and pre-production begins when work is no longer experimental.

9. *Intramural R & D activities*, for which data are provided in Tables 1 to 13 relating to expenditure and manpower effort, refer to R & D projects carried out in Australia by business enterprises on their own behalf or on behalf of other enterprises, institutions or individuals. *Extramural R & D activities* for which data are provided in Tables 14 and 15 relating only to expenditure, refer to R & D projects funded by business enterprises but carried out by other enterprises, institutions or individuals, either in Australia or overseas. Extramural expenditure includes amounts payable by business enterprises specifically for such projects.

10. *R & D expenditure* includes capital expenditure on the acquisition (less disposals) of fixed tangible assets such as land, buildings, vehicles, plant, machinery and equipment, and current expenditure on such items as wages, salaries, materials, fuels, rent and leasing, repairs and maintenance, data processing, etc., and a proportion of expenditure on general services and overhead costs attributable to the R & D effort. Respondents were asked to report data on an accruals basis of accounting.

11. The item *man years of effort on R & D* includes the effort of researchers, technicians and other staff directly supporting R & D. *Overhead staff*, i.e. administrative and general services employees such as personnel officers, canteen staff, pay clerks, janitors, cleaners, groundsmen, etc., whose work indirectly supports R & D, are excluded.

12. *Researchers* refers to persons actually engaged in the conception and/or creation of new knowledge, products, processes, methods and systems. *Technicians* refers to persons performing technical tasks in support of R & D, normally under the direction and supervision of a researcher. These tasks include assisting with or performing experiments, tests and analyses; preparing materials and equipment for experiments, taking records, making calculations and preparing charts and graphs; maintaining and operating advanced machinery and equipment; interviewing in social science surveys; and computer programming. *Other supporting staff* refers to skilled and unskilled craftsmen, secretarial and clerical staff working on or directly associated with R & D.

13. *Basic research* is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view. *Pure basic research* is research which is carried out without looking for long term economic or social benefits other than advancement of knowledge. It includes all Humanities R & D. *Strategic basic research* is research, directed into specified broad areas in the expectation of useful discoveries. It provides the broad base of knowledge necessary for the solution of recognised practical problems. *Applied research* also refers to original investigation undertaken in order to acquire new knowledge. It is, however directed towards a specific practical aim or objective. Applied research is undertaken either to determine possible uses for the findings of basic research or to determine new methods or ways of achieving some specific and predetermined objectives. *Experimental development* refers to systematic work, drawing on existing knowledge gained from research and/or practical experience, that is directed to producing new materials, products and devices, to installing new processes and improving substantially those already produced or installed. In the social sciences, experimental development may be defined as the process of translating knowledge gained through research into operational programs including demonstration projects for testing and evaluation.

14. *Turnover* is defined as sales of goods, commission revenue, repair and service revenue, rent, leasing and hiring revenue, government bounties and subsidies and all other operating revenue except interest, royalties and dividends. Also included is the value of capital work done by the enterprise for itself and the value of equipment withdrawn from stock for own use or for rental or lease outside the enterprise. Rent, leasing and hiring revenue reported by the enterprise has, where possible, been allocated to component establishments of the enterprise. That part which is unallocated is excluded from turnover and the calculation of value added.

15. *Value added* is defined as turnover, plus increase (or less decrease) in the value of stocks, less purchases and selected expenses. It may be regarded as a basic measure of an enterprise's unduplicated contribution to total economic activity. For a fuller definition, and the relationship of value added to gross product at factor cost, see *Integrated Economic Censuses: 1980-81 Enterprise Statistics* (8103.0).

16. *R & D intensity of enterprises that carried out R & D* is shown in this publication in two forms:

(a) *R & D intensity (expenditure)* is defined as expenditure on R & D carried out within the enterprise as a percentage of the turnover of those enterprises that carried out R & D.

(b) *R & D intensity (manpower)* is defined as man years of effort expended on R & D as a percentage of the number of persons employed by those enterprises that carried out R & D.

17. *R & D intensity of all enterprises in industry* is also shown in two forms:

(a) *R & D intensity (enterprises)* is defined as the number of enterprises that carried out R & D as a percentage of the total number of enterprises in the industry.

(b) *R & D intensity (manpower)* is defined as the number of man years of effort expended on R & D as a percentage of the number of persons employed by all enterprises in the industry. *Persons employed* comprises employees (including part-time and casual employees) on the payroll, working proprietors and working partners.

18. For a more comprehensive interpretation of the definitions of R & D or an explanation of other definitions not covered above contact the ABS or refer to the OECD publication, *The Measurement of Scientific and Technical Activities* ('Frascati Manual', 1980), OECD, Paris, 1981.

Sector classification

19. The sector classification used in the compilation of these statistics is adapted from the guidelines specified by the OECD for use in the conduct of R & D studies. Four institutional sectors are recognised: Business Enterprises, General Government, Private Non-profit and Higher Education.

Scope and units

20. The statistics in this publication relate, in principal, to all business enterprises within the scope of the Business Enterprise Sector in Australia. For the purposes of Australian R & D surveys of this Sector the organisational unit for the collection of statistics is the enterprise. An enterprise is defined broadly as the unit comprising all the operations in Australia of a single operating legal entity (e.g. company, partnership or sole proprietor).

21. *The Business Enterprise Sector* is defined (in accordance with the OECD guidelines mentioned above) as including:

- (1) all firms, organisations and institutions whose primary activity is the production of goods or services for sale to the general public at a price intended approximately to cover at least the cost of production, and
- (2) the private non-profit institutes mainly serving them.

22. The vast majority of enterprises in this Sector are private businesses. The remainder are public sector enterprises mainly engaged in trading or financial activities.

23. In the case of the patent applications statistics, shown in Table 21, the scope is restricted to those enterprises that either carried out R & D or funded other enterprises, institutions or individuals to do so during 1981-82.

Coverage and Survey Methodology

24. The 1981-82 Survey of R & D comprised a complete enumeration of business enterprises identified by the ABS as likely during 1981-82 to have:

- (a) carried out R & D (Tables 1 to 13 and 21); or
- (b) funded R & D activity to be carried out by other enterprises, institutions or individuals (Tables 14, 15 and 21); or
- (c) had receipts or payments for patent rights or other technical know-how (Tables 16 to 20).

25. Within the scope and coverage of the survey, enterprises were included in the collection if they satisfied any of the following criteria:

- (a) Enterprises recorded in the ABS's central register of economic units as:
 - (i) public sector trading and financial enterprises;
 - (ii) employing 140 persons or more; or
 - (iii) mainly engaged in providing consultant engineering or technical services (ASIC Class 6336), or with establishments thus engaged; or

- (iv) mainly engaged in scientific research (ASIC Class 8461), or with establishments thus engaged; or

- (v) having locations predominantly engaged in laboratory or testing work on behalf of establishments of the enterprise.

- (b) Enterprises which were members of major industrial research associations.

- (c) Enterprises which had applied for grants from the Australian Industrial Research and Development Incentives Board (AIRDIB) in recent years.

- (d) Enterprises responding to the 1973-74, 1976-77 and 1978-79 Surveys of R & D that reported R & D activity.

- (e) Enterprises identified from reports in newspapers, industrial journals, etc. as likely to have R & D activity.

26. However, some enterprises were excluded from the collection if information was available to indicate that no R & D was carried out, even though they satisfied one or more of the inclusion criteria listed above.

27. Statistics relating to enterprises mainly engaged in agriculture, forestry, fishing and hunting (i.e. industries in Division A of the *Australian Standard Industrial Classification* (ASIC), 1978 edition) are excluded from this publication, partly because of the collection difficulties which would have been involved, including them in the Survey of R & D and partly because such enterprises are believed to have very low R & D activity (agricultural R & D is carried out predominantly in specialised research institutes not included in ASIC Division A).

28. For similar reasons, statistics relating to individual inventors working in their own time and with their own facilities are not, in general, included in the publication.

29. To provide a coverage check of the enterprises included in the main 1981-82 survey collection, a separate sample survey of the remaining private enterprises on the central register was conducted. Data obtained from the returns of these 5,500 sample informants indicate that the main collection accounts for 97 per cent of the total expenditure on R & D activity carried out by enterprises. Since this coverage percentage is an estimate derived from the returns of sample informants, it is subject to sampling variability. Measurement of the sampling variability indicates that there are 19 chances in 20 that the coverage in fact exceeds 95 per cent. Coverage has not been estimated for individual industries or individual component items of total R & D expenditure, but for some of these more disaggregated statistics it may be considerably lower than 97 per cent. Coverage of the number of enterprises with R & D activity is much lower than the coverage of expenditure; the main collection is estimated to have covered 72 per cent of enterprises (19 chances in 20 that it exceeds 59 per cent).

30. It is estimated that the main collection accounts for 99 per cent of expenditure on R & D funded by enterprises but carried out by other organisations (19 chances in 20 that it exceeds 99 per cent), 99 per cent of payments for technical know-how (19 chances in 20 that it exceeds 98 per cent) and 99 per cent of receipts for technical know-how (19 chances in 20 that it exceeds 99 per cent).

31. *The R & D statistics for 1981-82 contained in this publication relate only to the enterprises included in the main collection* (as described above in paragraphs 24 and 25). They do not include estimates based on the results obtained from the sample survey conducted for coverage checking purposes.

Classification

32. Most of the statistical information in this publication is classified by industry of enterprise in accordance with the 1978 edition of the Australian Standard Industrial Classification (ASIC). Each enterprise is classified to the industry in which it mainly operates even though one or more of its component establishments (factories, shops, etc.) may be classified to other industries. The industry classification of an enterprise is determined on the basis of the industry classifications of the establishments of the enterprise weighted by the value added by these establishments or by some substitute weight such as total employment. For further comment see the *Australian Standard Industrial Classification, 1978, Volume 1* (1201.0).

33. Tables 12 and 13 contain a supplementary classification of R & D expenditure by the industry of the product (or process) field towards which the R & D effort was directed. This involved asking each respondent to list the broad categories of product towards which his R & D was directed, and to apportion his expenditure on R & D to these categories. Each of these categories was then keyed to the ASIC industry by which it is mainly produced. For example, an enterprise (itself classified to the mining industry) may have performed R & D to develop a more efficient ore crusher. As manufacturing of ore crushers is an activity primary to ASIC Class 3369, manufacturing of 'Industrial machinery and equipment n.e.c.', in the 1978 edition of the ASIC, R & D expenditure directed towards this product would therefore have been classified to ASIC Class 3369 in Tables 12 and 13. Because of the way in which products were described by the respondent, there were some instances where it was difficult to classify products (and particularly processes) to an ASIC industry; a degree of subjectivity is associated with the classification in these cases.

34. It was not possible in every instance to provide a full industry description in the tables. The full ASIC classification is shown in the publication referred to in paragraph 32.

Constant price estimates

35. Estimates of total R & D expenditure for four survey years are shown at both current and constant (average 1979-80) prices in Table 1. In concept, constant price estimates are measures from which the direct effects of price change have been eliminated. Although expressed

in monetary terms, the constant price measures shown in this publication vary only with changes in the underlying quantities of *inputs* purchased (including labour). In effect, quantities of broadly defined categories of inputs are weighted by their prices in the base year (1979-80). Because the measures relate to input quantities, they do not reflect changes in the efficiency with which labour, capital and other inputs are used.

36. The estimates of the wages, salaries and other labour cost components of these constant price estimates were obtained by multiplying, for each broad category of labour, the quantity (man years) of labour used in each period by the relevant average labour cost in the base period. The non-labour cost components were estimated by deflating each current price value by a composite price index of relevant materials or capital expenditure items. In revaluing R & D expenditure, extensive use has been made of price series used in deriving constant price national accounts estimates.

37. For a more comprehensive description of constant price concepts and estimation procedures see *Australian National Accounts: Concepts, Sources and Methods* (5216.0).

Reliability of statistics

38. The statistics contained in this publication should be interpreted with caution for the following reasons:

- (a) Many respondents do not record data on R & D activity and on receipts and payments for technical know-how separately in their accounts, and as a result needed to make estimates when completing the survey questionnaire.
- (b) The OECD standard definition of research and experimental development (R & D) used for the survey differs in some respects from what particular businesses may regard as research and development, particularly since grants by the Australian Industrial Research and Development Incentives Board are not available in respect of all the types of R & D that come within the survey definition.

Related publications

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

Research and Experimental Development, Business Enterprises, Australia, 1981-82 (Preliminary) (8105.0)

Research and Experimental Development, General Government Organisations, Australia, 1981-82 (8109.0)

Research and Experimental Development, Higher Education Organisations, Australia, 1981 (8111.0)

Research and Experimental Development, Business Enterprises, Australia, 1978-79 (8104.0)

Research and Experimental Development, All Sector Summary, Australia, 1978-79 (8112.0)

Research and Experimental Development, Energy Production, Utilisation and Conservation, All Sectors, Australia, 1979-80 (8110.0)

Science and Technology Statement: 1982-83 (Department of Science and Technology, Canberra, Australia, 1983)

The Measurement of Scientific and Technical Activities ('Frascati Manual' 1980) OECD, Paris 1981.

40. The publication, *Research and Experimental Development, All Sector Summary, Australia, 1981-82* (8112.0) incorporating results for the Private Non-profit Sector will be published shortly.

41. 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.

42. Copies of questionnaires used in the 1981-82 Surveys of Research and Experimental Development are available on request from the ABS by phoning (062) 52 5487.

Symbols and other usages

r revised

n.a. not available

n.e.c. not elsewhere classified

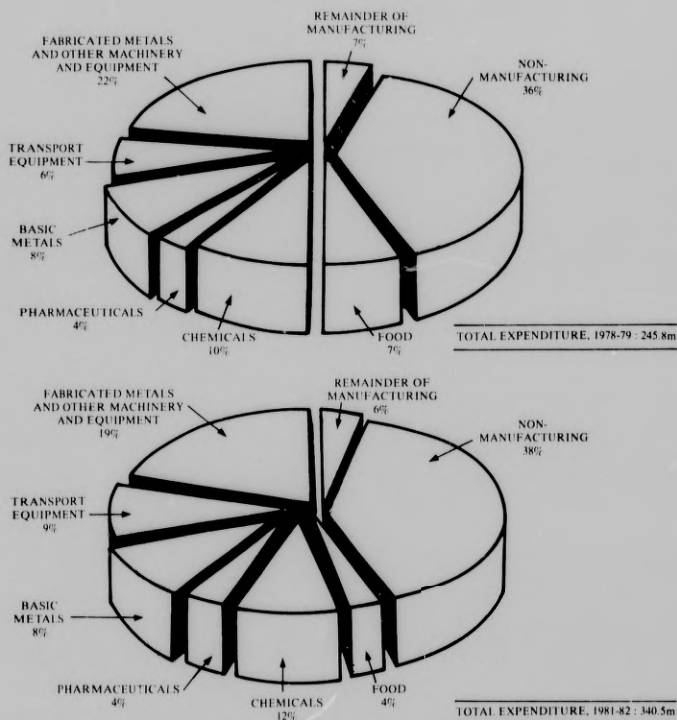
ASIC Australian Standard Industrial Classification

n.p. not available for separate publication (but included in totals where applicable)

— nil or less than half the final digit shown

43. Where figures have been rounded, discrepancies may occur between sums of the component items and totals.

**RESEARCH AND EXPERIMENTAL DEVELOPMENT
CARRIED OUT BY BUSINESS ENTERPRISES—AUSTRALIA, 1978-79 AND 1981-82
R & D EXPENDITURE BY INDUSTRY OF ENTERPRISE(a)**



**TABLE 1. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES(a)
EXPENDITURE AT CURRENT AND CONSTANT PRICES
(\$m)**

	1973-74	1976-77	1978-79	1981-82
AT CURRENT PRICES				
Private enterprises	(b)190.4	160.4	205.8	285.7
Public sector business enterprises	n.a.	42.4	40.0	54.8
Total business enterprises	n.a.	202.8	245.8	340.5
AT CONSTANT (AVERAGE 1979-80) PRICES				
Private enterprises	(b)409.8	215.6	226.5	218.4
Public sector business enterprises	n.a.	54.7	44.0	45.4
Total business enterprises	n.a.	270.3	270.5	263.8

(a) Excludes enterprises in ASIC Division A.

(b) Sample survey; the standard error expressed in \$m is \$16.0m.

**TABLE 2. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES(a), AUSTRALIA
R & D EXPENDITURE AND R & D MANPOWER BY INDUSTRY OF ENTERPRISE(b) 1976-77, 1978-79 AND 1981-82**

ASIC code	Industry of enterprise(h)	Enterprises that carried out R & D (number)			R & D expenditure (\$m)			Man years of effort on R & D		
		1976-77	1978-79	1981-82	1976-77	1978-79	1981-82	1976-77	1978-79	1981-82
11-15	Mining (excluding services to mining)	22	17	23	7.0	9.7	22.6	446	315	381
	Manufacturing—									
21	Food, beverages and tobacco	69	84	69	11.6	16.1	13.1	551	545	367
23-24	Textiles, clothing and footwear	27	22	16	2.1	1.4	0.8	106	42	24
25	Wood, wood products and furniture	22	24	19	0.9	1.6	1.7	50	55	43
26	Paper, paper products, printing and publishing	16	14	12	3.3	4.1	5.3	149	144	125
27	Chemicals, petroleum and coal products	115	118	124	27.1	35.2	53.1	1,335	1,381	1,231
28	Non-metallic mineral products	32	27	22	3.8	4.2	4.8	169	154	109
29	Basic metal products	36	35	27	19.0	20.9	27.4	903	776	673
31	Fabricated metal products	74	81	80	4.0	4.5	6.7	228	198	161
32	Transport equipment	44	47	51	14.6	15.6	31.9	761	604	903
334	Photographic, professional and scientific equipment	20	16	25	4.6	6.7	5.1	232	230	160
335	Appliances and electrical equipment	129	120	156	21.1	33.1	37.2	1,209	1,234	899
336	Industrial machinery and equipment	141	128	153	8.2	8.8	14.7	425	388	413
33	Total other machinery and equipment	290	264	334	33.9	48.6	56.9	1,866	1,851	1,472
34	Miscellaneous manufacturing	57	58	65	3.5	5.9	7.3	185	210	180
C	Total manufacturing	782	774	819	123.9	158.1	209.1	6,306	5,960	5,287
	Other Industries—									
F	Wholesale and retail trade	90	112	103	9.2	11.4	11.9	381	390	290
63	Property and business services	182	169	203	11.2	14.2	18.5	532	472	465
8461	Research and scientific institutions	30	29	28	11.7	13.3	21.8	504	460	464
(c)	Other n.e.c.	62	85	70	39.8	39.1	56.6	1,177	1,030	1,034
16, D-I	Total other industries	364	395	404	71.9	78.0	108.8	2,594	2,352	2,255
	Total all industries	1,146	1,169	1,223	202.8	245.8	317.9	9,334	8,626	7,923

(a) Excludes enterprises in ASIC Division A. (b) 1978-79 and 1981-82 data are classified by the 1978 edition of ASIC; 1976-77 data are classified by the 1969 edition of ASIC. If the 1978 edition were used to classify the 1976-77 data shown here only minor differences would occur. (c) ASIC Codes 16, D, E, G-H, 61-62, J-I, excluding ASIC class 8461.

TABLE 3. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES, AUSTRALIA, 1981-82
BROAD INDICATORS BY INDUSTRY OF ENTERPRISE

Industry of enterprise		Resources expended on R & D		Enterprises that carried out R & D					All enterprises in industry		
		Expenditure	Man-power		Enter- prises	Turn- over (a)	Value added (a)	R & D intensity		Enter- prises (d)	Man- power (e)
			Re- searcher effort	Total R & D effort				Expen- diture (b)	Man- power (c)		
ASIC code	Description	\$' 000	man- years	man- years	number	\$m	\$m	%	%	%	%
Mining—											
11	Metallic minerals	20,159	150	354	17	2,221	1,213	0.9	1.5	4.7	0.8
12-15	Non-metallic minerals	2,426	14	27	6	2,502	2,694	0.1	0.5	1.1	0.1
11-15	Total mining (excl. services to mining)	22,585	163	381	23	4,723	3,307	0.5	1.3	2.5	0.5
Manufacturing—											
211	Meat products	511	5	11	5	162	74	0.3	0.4	0.7	—
212	Milk products	2,934	56	96	15	1,385	433	0.2	0.7	8.2	0.4
213	Fruit and vegetable products	1,181	26	34	10	413	160	0.2	0.8	6.3	0.3
215-216	Flour and cereal products, bread, cakes and biscuits	3,188	45	75	11	674	219	0.5	1.0	8.9	0.2
214, 217	Margarine, oils, fats and other food products	3,855	66	99	19	751	261	0.5	1.5	3.0	0.3
218-219	Beverages, malt and tobacco products	1,455	24	52	9	743	383	0.2	0.9	1.6	0.2
21	Total food, beverages and tobacco	13,124	221	367	69	4,127	1,530	0.3	0.9	2.9	0.2
234	Textile fibres, yarns and woven fabrics	286	3	8	7	240	104	0.1	0.1	2.7	—
235, 24	Other textile products and clothing and footwear	499	6	16	9	93	37	0.5	1.2	0.3	—
23-24	Total textiles, clothing and footwear	785	9	24	16	333	142	0.2	0.4	0.4	—
25	Wood, wood products and furniture	1,719	16	43	19	269	119	0.6	1.2	0.2	—
263	Paper and paper products	5,188	n.p.	122	9	1,203	498	0.6	1.0	3.8	0.4
264	Printing and allied industries	67	n.p.	3	3	10	5	0.4	1.1	—	—
26	Total paper, paper products, printing and publishing	5,255	59	125	12	1,212	503	0.7	1.0	0.3	0.1
2753	Synthetic resins and rubber	2,646	44	73	9	499	159	0.4	2.0	14.5	1.4
2754-2755	Organic and inorganic industrial chemicals n.e.c.	22,046	248	449	17	1,303	487	0.5	4.5	14.3	3.7
2762	Paints	7,016	93	200	15	432	185	1.7	3.7	10.1	2.3
2763	Pharmaceutical and veterinary products	13,528	125	278	28	542	250	1.6	4.3	20.0	2.5
(f)	Other chemical, petroleum and coal products	7,878	148	231	55	1,577	703	0.5	1.6	8.7	1.7
27	Total chemical, petroleum and coal products	53,114	659	1,231	124	4,354	1,783	1.2	3.1	12.4	1.7
287	Cement and concrete products	987	16	32	7	288	137	0.3	0.9	0.9	0.2
285-286, 288	Glass, clay and other non-metallic mineral products	3,839	33	77	15	631	384	0.6	0.8	1.9	0.2
28	Total non-metallic mineral products	4,826	49	109	22	920	520	0.5	0.8	1.4	0.2
294	Basic iron and steel	22,954	255	577	14	4,574	2,051	0.5	0.9	4.0	0.7
295-296	Basic non-ferrous metals	4,405	45	96	13	1,284	385	0.3	1.0	5.2	3.7
29	Total basic metal products	27,359	300	673	27	5,857	2,436	0.5	1.0	4.5	0.6

For footnotes see end of table.

TABLE 3. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES, AUSTRALIA, 1981-82
BROAD INDICATORS BY INDUSTRY OF ENTERPRISE—continued

Industry of enterprise		Resources expended on R & D			Enterprises that carried out R & D					All enterprises in industry	
		Man-power			R & D intensity				R & D intensity		
		Expenditure	Research effort	Total R & D effort	Enterprises	Turn-over (a)	Value added (a)	Expenditure (b)	Man-power (c)	Enterprises (d)	Man-power (e)
ASIC code	Description	\$' 000	man-years	man-years	number	\$m	\$m	%	%	%	%
314	Structural metal products	1,512	14	27	15	338	115	0.4	0.8	0.6	0.1
315	Sheet metal products	2,039	22	37	24	326	140	0.6	0.8	1.8	0.1
316	Other fabricated metal products	3,177	40	96	41	534	262	0.6	1.0	1.2	0.2
31	Total fabricated metal products	6,729	76	161	80	1,198	517	0.6	0.9	1.1	0.1
323	Motor vehicles and parts	29,725	215	853	34	2,806	1,097	1.0	2.0	2.6	1.0
324	Other transport equipment	2,209	22	50	17	227	124	1.0	0.9	1.9	0.3
32	Total transport equipment	31,933	237	903	51	3,033	1,221	1.1	1.8	2.3	0.9
334	Photographic, professional and scientific equipment	5,083	83	160	25	95	53	5.4	7.8	4.5	1.8
3351-3352	Radio and T.V. receivers; audio equipment and electronic equipment n.e.c.	26,786	196	578	62	1,005	159	1.8	0.6	13.5	3.0
3353	Refrigerators and household appliances	4,489	55	141	23	694	605	0.6	1.8	8.0	0.5
3354	Water heating systems	949	8	20	7	41	16	2.3	1.3	13.5	2.0
3355-3357	Other electrical machinery and equipment	4,984	65	160	64	636	277	0.8	3.8	9.6	0.5
335	Total appliances and electrical equipment	37,208	324	899	156	2,376	1,058	1.6	1.3	9.6	1.0
3361	Agricultural machinery	6,587	65	205	29	704	274	0.9	2.5	8.2	1.7
3362	Construction machinery	304	1	6	8	29	10	1.1	1.7	10.0	0.4
3363	Materials handling equipment	252	5	10	11	26	13	1.0	2.2	4.8	0.2
3364-3369	Other industrial machinery and equipment n.e.c.	7,510	84	193	105	963	433	0.8	1.2	3.4	0.4
336	Total industrial machinery and equipment	14,654	155	414	153	1,721	730	0.9	1.6	4.0	0.5
33	Total other machinery and equipment	56,945	562	1,472	334	4,192	1,841	1.4		5.6	0.8
346	Rubber products	1,461	22	37	11	1,307	504	0.1	0.2	5.4	0.1
347	Plastic and related products	4,260	48	102	37	359	150	1.2	1.9	3.1	0.3
345,348	Leather, leather products and other manufacturing	1,605	24	40	17	69	32	2.3	3.2	0.6	0.2
34	Total miscellaneous manufacturing	7,326	93	180	65	1,734	687	0.4	0.7	1.6	0.2
C	Total manufacturing	209,116	2,280	5,287	819	27,231	11,300	0.8	1.5	1.9	0.4
	Other industries—										
E	Construction	2,761	34	51	23	n.a.	n.a.	n.a.	0.9	—	—
47	Wholesale trade	11,499	151	277	93	n.a.	n.a.	n.a.	1.1	0.3	0.1
48	Retail trade	413	8	13	10	n.a.	n.a.	n.a.	0.9	—	—
F	Total wholesale and retail trade	11,912	159	290	103	n.a.	n.a.	n.a.	2.1	0.1	—
63	Property and business services	18,509	235	466	203	n.a.	n.a.	n.a.	4.2	0.3	0.1
8461	Research and scientific institutions	21,770	192	464	28	n.a.	n.a.	n.a.	0.4	13.2	n.a.
(g)	Other n.e.c.	53,853	409	983	47	n.a.	n.a.	n.a.	1.0	—	n.a.
16, D-L	Total other industries	108,805	1,029	2,255	404	n.a.	n.a.	n.a.	0.7	0.1	—
	Total all industries(h)	340,507	3,472	7,923	1,246	n.a.	n.a.	n.a.	1.2	0.2	0.1
	Private business enterprise contribution to 'Total all industries'										
	1981-82	285,686	3,054	6,913	1,212	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	1978-79	205,814	3,186	7,546	1,144	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

(a) Excludes data in respect of single establishment manufacturing enterprises with fewer than four persons employed at end of year. (b) Expenditure on R & D expressed as a percentage of the turnover of those enterprises that carried out R & D. (c) Man-years of effort expended on R & D as a percentage of the number of persons employed by those enterprises that carried out R & D. (d) Number of enterprises that carried out R & D expressed as a percentage of the total number of enterprises in the industry. (e) Man-years of effort expended on R & D as a percentage of the number of persons employed by all enterprises in the industry. (f) ASIC Classes 2751-2752, 2761, 2764-2780. (g) ASIC codes 16, D, G-H, 61-62, J, 8141-8306, 8462-9364. (h) Excludes ASIC Division A.

TABLE 4. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES, AUSTRALIA, 1981-82
DETAILS OF R & D EXPENDITURE BY INDUSTRY OF ENTERPRISE
(\$'000)

Industry of enterprise		Type of expenditure				Type of activity(a)			Source of funds(a)			
		Total expenditure	Capital expenditure	Wages and salaries	Other current expenditure	Basic research	Applied research	Experimental development	Own funds	Other private enterprises in Australia	Government funds	Other Australian and overseas(b)
ASIC code	Description											
	Mining—											
11	Metallic minerals	20,159	4,801	12,492	2,866	358	7,253	12,548	n.p.	2,176	n.p.	n.p.
12-15	Non-metallic minerals	2,426	842	1,041	543	—	1,200	1,227	n.p.	—	n.p.	—
11-15	Total mining (excl. services to mining)	22,585	5,643	13,533	3,409	358	8,453	13,775	18,726	2,176	n.p.	n.p.
	Manufacturing—											
211	Meat products	511	226	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	—	n.p.	—
212	Milk products	2,934	345	1,709	860	41	2,029	864	2,810	n.p.	n.p.	—
213	Fruit and vegetable products	1,181	67	819	295	n.p.	n.p.	1,092	n.p.	—	n.p.	—
215-216	Flour and cereal products, bread, cakes and biscuits	3,188	494	1,748	946	n.p.	n.p.	1,440	2,840	—	349	—
214,217	Margarine, oils, fats and other food products	3,855	833	2,329	692	n.p.	n.p.	1,847	3,165	—	689	—
218-219	Beverages, malt and tobacco products	1,455	314	n.p.	n.p.	n.p.	872	n.p.	1,223	—	231	—
21	Total food, beverages and tobacco	13,124	2,278	7,834	3,013	329	6,341	6,255	11,471	n.p.	n.p.	—
234	Textile fibres, yarns and woven fabrics	286	10	131	144	n.p.	n.p.	233	n.p.	—	n.p.	—
235,24	Other textile products and clothing and footwear	499	128	240	131	n.p.	n.p.	292	n.p.	—	n.p.	—
23-24	Total textiles, clothing and footwear	785	138	372	275	145	115	525	594	—	191	—
25	Wood, wood products and furniture	1,719	219	1,030	470	91	210	1,417	1,525	—	194	—
263	Paper and paper products	5,188	642	n.p.	n.p.	n.p.	n.p.	n.p.	4,806	—	382	—
264	Printing and allied industries	67	—	n.p.	n.p.	n.p.	n.p.	n.p.	67	—	—	—
26	Total paper, paper products, printing and publishing	5,255	642	3,434	1,179	127	3,108	2,019	4,873	—	382	—
2753	Synthetic resins and rubber	2,646	223	1,804	619	n.p.	n.p.	2,286	2,428	—	218	—
2754-2755	Organic and inorganic industrial chemicals n.e.c.	22,046	2,626	13,460	5,960	n.p.	n.p.	16,317	19,476	n.p.	n.p.	n.p.
2762	Paints	7,016	1,184	4,501	1,331	443	1,802	4,770	6,440	n.p.	n.p.	—
2763	Pharmaceutical and veterinary products	13,528	1,036	7,193	5,299	1,336	5,787	6,405	10,289	n.p.	1,862	n.p.
(c)	Other chemical, petroleum and coal products	7,878	856	5,473	1,549	123	2,634	5,121	7,193	n.p.	521	n.p.
27	Total chemical, petroleum and coal products	53,114	5,924	32,432	14,758	2,161	16,052	34,900	45,826	508	4,766	2,014
287	Cement and concrete products	987	146	703	139	n.p.	n.p.	804	903	—	85	—
285-286,288	Glass, clay and other non-metallic mineral products	3,839	1,408	1,864	567	n.p.	n.p.	1,706	3,677	—	162	—
28	Total non-metallic mineral products	4,826	1,554	2,567	706	171	2,145	2,510	4,579	—	247	—
294	Basic iron and steel	22,954	2,400	16,213	4,341	1,137	10,466	11,351	19,434	n.p.	n.p.	—
295-296	Basic non-ferrous metals	4,405	707	2,711	986	—	1,888	2,517	3,952	—	453	—
29	Total basic metal products	27,359	3,107	18,924	5,327	1,137	12,354	13,869	23,385	n.p.	n.p.	—

For footnotes see end of table.

TABLE 4. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES, AUSTRALIA, 1981-82
DETAILS OF R & D EXPENDITURE BY INDUSTRY OF ENTERPRISE—continued
(\$' 000)

Industry of enterprise	ASIC code	Description	Type of expenditure				Type of activity(a)			Source of funds(a)			
			Total expenditure	Capital expenditure	Wages and salaries	Other current expenditure	Basic research	Applied research	Experimental development	Own funds	Other private enterprises in Australia	Government funds	Other Australian and overseas(b)
314		Structural metal products	1,512	623	604	285	n.p.	n.p.	1,438	1,387	—	125	—
315		Sheet metal products	2,039	329	994	717	40	630	1,370	1,920	—	119	—
316		Other fabricated metal products	3,177	373	2,149	655	n.p.	n.p.	2,248	2,781	n.p.	n.p.	—
31		Total fabricated metal products	6,729	1,324	3,747	1,657	83	1,590	5,056	6,088	n.p.	n.p.	—
323		Motor vehicles and parts	29,725	2,455	18,446	8,824	337	757	28,630	28,442	n.p.	n.p.	—
324		Other transport equipment	2,209	94	1,841	274	—	165	2,044	823	n.p.	n.p.	—
32		Total transport equipment	31,933	2,549	20,287	9,098	337	922	30,674	29,264	26	2,643	—
334		Photographic, professional and scientific equipment	5,083	367	3,021	1,695	143	1,557	3,383	4,631	—	452	—
3351-3352		Radio and T.V. receivers; audio equipment and electronic equipment n.e.c.	26,786	2,398	16,342	8,046	869	5,864	20,053	19,904	n.p.	4,124	n.p.
3353		Refrigerators and household appliances	4,489	428	3,232	829	n.p.	925	n.p.	4,247	n.p.	—	—
3354		Water heating systems	949	31	494	424	12	219	n.p.	845	—	103	—
3355-3357		Other electrical machinery and equipment	4,984	n.p.	3,465	n.p.	n.p.	1,359	3,454	4,068	n.p.	n.p.	—
335		Total appliances and electrical equipment	37,208	3,388	23,515	10,306	1,336	8,367	27,505	29,065	2,552	n.p.	n.p.
3361		Agricultural machinery	6,587	n.p.	4,367	n.p.	258	1,402	4,927	6,388	—	199	—
3362		Construction machinery	304	n.p.	147	n.p.	—	n.p.	242	n.p.	n.p.	n.p.	—
3363		Materials handling equipment	252	—	195	57	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	—
3364-3369		Other industrial machinery and equipment n.e.c.	7,510	947	4,441	2,144	293	1,293	5,923	5,714	n.p.	1,683	n.p.
336		Total industrial machinery and equipment	14,654	1,292	9,127	4,234	553	2,728	11,373	12,571	152	n.p.	n.p.
33		Total other machinery and equipment	56,945	5,047	34,663	16,235	2,032	12,652	42,261	46,267	2,704	7,744	258
346		Rubber products	1,461	269	825	367	n.p.	n.p.	902	1,279	—	182	—
347		Plastic and related products	4,260	1,221	2,317	722	n.p.	n.p.	3,427	3,867	—	393	—
345, 348		Leather, leather products and other manufacturing	1,605	166	839	600	n.p.	n.p.	1,251	1,519	—	86	—
34		Total miscellaneous manufacturing	7,326	1,656	3,981	1,689	80	1,665	5,581	6,665	—	661	—
C		Total manufacturing	209,116	24,438	130,270	54,408	6,694	57,355	145,067	180,539	4,895	21,410	2,272
		Other industries—											
E		Construction	2,761	318	1,336	1,107	n.p.	n.p.	1,555	2,372	n.p.	n.p.	—
47		Wholesale trade	11,499	873	8,236	3,257	1,381	2,780	7,338	9,879	65	1,239	315
48		Retail trade	413	32	274	107	27	98	288	353	—	60	—
F		Total wholesale and retail trade	11,912	905	8,510	3,364	1,408	2,878	7,626	10,232	65	1,299	315
63		Property and business services	18,509	1,996	11,875	4,639	616	5,863	12,030	11,044	2,694	2,398	2,372
8461		Research and scientific institutions	21,770	2,476	12,160	7,134	n.p.	n.p.	2,341	4,985	10,066	4,945	1,773
(d)		Other n.e.c.	53,853	9,658	29,323	14,872	3,999	25,797	24,058	51,166	n.p.	1,441	n.p.
16, D-L		Total other industries	108,805	14,485	63,203	31,116	11,992	49,204	47,609	79,800	13,438	n.p.	n.p.
		Total all industries(e)	340,507	44,567	207,006	88,934	19,044	115,012	206,451	279,066	20,509	33,347	7,585
		Private business enterprise contribution to 'Total all industries'—											
		1981-82	285,686	35,336	177,259	73,093	13,983	89,696	182,009	228,195	19,960	29,951	7,580
		1978-79	205,814	21,856	127,387	56,470	7,667	61,721	136,428	161,237	13,870	21,266	9,440

(a) For further information see also Table 9. (b) Includes Higher Education Sector. (c) ASIC Classes 2751-2752, 2761, 2764-2780. (d) ASIC codes 16, D, G-H, 61-62, J, 8141-8306, 8462-9364. (e) Excludes ASIC Division A.

TABLE 5. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES, AUSTRALIA, 1981-82
DETAILS OF R & D MANPOWER BY INDUSTRY OF ENTERPRISE
(man-years)

Industry of enterprise		Manpower by type of employee				Manpower by enterprise employment size(a)		Researcher effort by location(b)					Other Australian and overseas
		Total man-years	Re-searchers	Tech-nicians	Other supporting staff	Less than 200	200 or more	N.S.W.	Vic.	Qld	S.A.		
ASIC code	Description												
11	Mining—												
	Metallic minerals	354	150	n.p.	n.p.	20	334	n.p.	12	n.p.	n.p.		52
12-15	Non-metallic minerals	27	14	n.p.	n.p.	7	20	n.p.	1	n.p.	—		—
11-15	Total mining (excl. services to mining)	381	163	111	106	27	354	26	13	n.p.	n.p.		52
	Manufacturing—												
211	Meat products	11	5	4	2	—	11	n.p.	n.p.	—	n.p.		—
212	Milk products	96	56	29	10	9	87	3	49	2	n.p.	n.p.	n.p.
213	Fruit and vegetable products	34	26	6	2	4	30	n.p.	19	—	4	n.p.	n.p.
215-216	Flour and cereal products, bread, cakes and biscuits	75	45	23	7	25	50	n.p.	15	n.p.	—		—
214, 217	Margarine, oils, fats and other food products	99	66	19	14	11	88	27	n.p.	n.p.	—		n.p.
218-219	Beverages, malt and tobacco products	52	24	20	8	6	46	n.p.	16	n.p.	n.p.	n.p.	n.p.
21	Total food, beverages and tobacco	367	221	101	44	55	312	65	133	12	9		3
234	Textile fibres, yarns and woven fabrics	8	3	n.p.	n.p.	7	1	n.p.	2	n.p.	—		n.p.
235, 24	Other textile products and clothing and footwear	16	6	n.p.	n.p.	9	8	4	2	—	—		—
23-24	Total textiles, clothing and footwear	24	9	9	6	16	8	n.p.	4	n.p.	—		n.p.
25	Wood, wood products and furniture	43	16	17	10	19	24	10	2	2	n.p.		n.p.
263	Paper and paper products	122	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	—	n.p.		n.p.
264	Printing and allied industries	3	n.p.	n.p.	n.p.	3	—	n.p.	n.p.	—	n.p.		—
26	Total paper, paper products, printing and publishing	125	59	53	14	n.p.	n.p.	7	28	—	n.p.		n.p.
2753	Synthetic resins and rubber	73	44	n.p.	n.p.	15	58	12	n.p.	n.p.	—		—
2754-2755	Organic and inorganic industrial chemicals n.e.c.	449	248	n.p.	n.p.	30	419	49	187	n.p.	n.p.		n.p.
2762	Paints	200	93	84	23	38	162	47	n.p.	—	n.p.		n.p.
2763	Pharmaceutical and veterinary products	278	125	97	55	45	233	52	65	n.p.	n.p.		4
(c)	Other chemical, petroleum and coal products	231	148	55	28	70	161	63	41	33	8		4
27	Total chemical, petroleum and coal products	1,231	659	396	176	198	1,033	222	366	37	16		18
287	Cement and concrete products	32	16	7	10	6	26	n.p.	n.p.	2	—		n.p.
285-286, 288	Glass, clay and other non-metallic mineral products	77	33	27	17	6	71	18	n.p.	n.p.	n.p.		n.p.
28	Total non-metallic mineral products	109	49	34	27	13	96	n.p.	21	n.p.	n.p.		2
294	Basic iron and steel	577	255	196	127	10	568	182	n.p.	n.p.	n.p.		n.p.
295-296	Basic non-ferrous metals	96	45	22	28	6	90	8	n.p.	n.p.	n.p.		n.p.
29	Total basic metal products	673	300	218	155	15	658	190	61	14	n.p.		n.p.

For footnotes see end of table.

TABLE 5. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES, AUSTRALIA, 1981-82
DETAILS OF R & D MANPOWER BY INDUSTRY OF ENTERPRISE—continued
(man-years)

Industry of enterprise	ASIC code	Description	Manpower by type of employee				Manpower by enterprise employment size(a)		Researcher effort by location(b)					Other Australian and overseas
			Total man-years	Re-searchers	Tech-nicians	Other supporting staff	Less than 200	200 or more	N.S.W.	Vic.	Qld	S.A.	Other Australian and overseas	
	314	Structural metal products	27	14	10	3	n.p.	n.p.	2	6	3	n.p.	n.p.	
	315	Sheet metal products	37	21	14	2	n.p.	16	9	3	n.p.	n.p.	n.p.	
	316	Other fabricated metal products	96	40	37	19	39	57	12	13	n.p.	9	n.p.	
	31	Total fabricated metal products	161	75	60	25	n.p.	n.p.	22	22	8	19	4	
	323	Motor vehicles and parts	853	215	503	134	46	807	26	n.p.	n.p.	n.p.	n.p.	
	324	Other transport equipment	50	21	9	20	15	35	14	n.p.	n.p.	n.p.	n.p.	
	32	Total transport equipment	903	237	512	154	61	842	40	147	4	43	4	
	334	Photographic, professional and scientific equipment	160	83	62	15	40	120	n.p.	26	5	n.p.	—	
	3351-3352	Radio and T.V. receivers; audio equipment and electronic equipment n.e.c.	578	196	324	58	120	458	133	33	5	14	11	
	3353	Refrigerators and household appliances	141	55	42	44	n.p.	n.p.	20	n.p.	n.p.	8	n.p.	
	3354	Water heating systems	20	8	8	3	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	3	
	3355-3357	Other electrical machinery and equipment	160	65	60	35	101	59	26	33	n.p.	4	n.p.	
	335	Total appliances and electrical equipment	899	324	434	141	255	644	n.p.	86	14	n.p.	18	
	3361	Agricultural machinery	205	65	87	53	33	172	n.p.	23	6	n.p.	n.p.	
	3362	Construction machinery	6	1	4	1	6	—	n.p.	—	—	n.p.	n.p.	
	3363	Materials handling equipment	10	5	4	1	10	3	—	—	—	—	2	
	3364-3369	Other industrial machinery and equipment n.e.c.	193	84	65	44	156	38	45	23	5	6	6	
	336	Total industrial machinery and equipment	414	155	159	99	204	209	49	46	12	27	22	
	33	Total other machinery and equipment	1,472	562	655	255	499	973	266	158	31	213	40	
	346	Rubber products	37	22	12	4	n.p.	n.p.	n.p.	13	n.p.	n.p.	—	
	347	Plastic and related products	102	48	40	15	57	65	13	26	n.p.	5	n.p.	
	345, 348	Leather, leather products and other manufacturing	40	24	10	6	n.p.	n.p.	n.p.	9	n.p.	n.p.	2	
	34	Total miscellaneous manufacturing	180	93	62	25	83	96	19	45	14	14	2	
	C	Total manufacturing	5,287	2,280	2,117	891	1,041	4,246	863	986	128	194	109	
		Other industries—												
	E	Construction	51	34	10	7	19	32	11	18	n.p.	n.p.	n.p.	
	47	Wholesale trade	277	151	76	50	n.p.	n.p.	41	n.p.	n.p.	n.p.	12	
	48	Retail trade	13	8	4	2	n.p.	n.p.	4	n.p.	n.p.	n.p.	—	
	F	Total wholesale and retail trade	290	159	80	52	140	151	45	63	25	13	12	
	63	Property and business services	464	235	142	89	333	132	119	37	15	8	55	
	8461	Research and scientific institutions	464	192	128	144	230	234	119	5	12	17	19	
	(d)	Other n.e.c.	983	409	340	235	103	880	65	296	n.p.	n.p.	n.p.	
	16, D-L	Total other industries	2,255	1,029	700	526	827	1,428	360	419	108	53	88	
		Total all industries(e)	7,923	3,472	2,928	1,523	1,895	6,028	1,249	1,418	304	252	249	
		Private business enterprise contribution to 'Total all industries'—												
		1981-82	6,913	3,053	2,565	1,295	n.a.	n.a.	1,206	1,087	287	234	240	
		1978-79	7,546	3,186	2,729	1,630	n.a.	n.a.	1,233	1,266	318	227	142	

(a) For further information see also Table 10. (b) For further information see also Table 11. (c) ASIC Classes 2751-2752, 2761, 2764-2780. (d) ASIC codes 16, D, G-H, 61-62, J, 8141-8306, 8462-9364. (e) Exclude ASIC Division A.

TABLE 6. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES, AUSTRALIA, 1981-82
R & D EXPENDITURE OF MINING AND MANUFACTURING ENTERPRISES(a) BY INDUSTRY OF ENTERPRISE BY BROAD ENTERPRISE TURNOVER SIZE(b)
(\$' 000)

Industry of enterprise		Enterprise turnover size (\$m)				Total
ASIC code	Description	Less than 5.0	5.0-19.9	20.0-49.9	50.0 or more	
11-15	Mining (excl. services to mining)	n.a.	n.a.	539	8,672	9,732
	Manufacturing—					
21	Food, beverages and tobacco	377	1,690	2,356	8,701	13,124
23-24	Textiles, clothing and footwear	284	349	130	22	785
25	Wood, wood products and furniture	n.p.	n.p.	463	483	1,719
26	Paper, paper products, printing and publishing	n.p.	n.p.	345	4,808	5,255
2763	Pharmaceuticals and veterinary products	1,282	1,413	8,736	2,097	13,528
(c)	Chemicals, petroleum and coal products	1,934	3,602	4,910	29,140	39,586
28	Non-metallic mineral products	435	98	624	3,670	4,826
29	Basic metal products	79	571	518	26,191	27,359
31	Fabricated metal products	2,213	949	961	2,605	6,729
32	Transport equipment	1,351	957	1,278	28,348	31,933
334-335	Photographic, professional and scientific equipment and appliances and electrical equipment	7,843	7,832	3,910	22,707	42,291
336	Industrial machinery and equipment	6,552	1,750	1,980	4,372	14,654
33	Total other machinery and equipment	14,395	9,582	5,890	27,079	56,945
34	Miscellaneous manufacturing	3,470	906	1,273	1,676	7,326
C	Total manufacturing	26,578	20,225	27,484	134,829	209,116

(a) Excludes ASIC Subdivision 16. (b) For further information see also Table 7. (c) ASIC Subdivision 27 excluding ASIC Class 2763.

TABLE 7. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES, AUSTRALIA, 1981-82
R & D EXPENDITURE OF MINING AND MANUFACTURING ENTERPRISES(a) BY DETAILED ENTERPRISE TURNOVER SIZE(b)
(\$' 000)

Enterprise turnover size (\$m)	Less than 1.0	1.0-4.9	5.0-9.9	10.0-19.9	20.0-29.9	30.0-39.9	40.0-49.9	50.0-74.9	75.0-99.9	100.0-149.9	150.0-199.9	200.0 or more	Total
	13,849	13,059	6,678	17,456	10,208	6,155	11,187	10,789	10,090	19,980	7,711	104,539	231,702

(a) Excludes ASIC Subdivision 16. (b) For further information see also Table 6.

TABLE 8. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES, AUSTRALIA, 1981-82
R & D EXPENDITURE OF MINING AND MANUFACTURING ENTERPRISES(a) BY DETAILED ENTERPRISE VALUE ADDED SIZE
(\$' 000)

Enterprise value added size (\$m)	Less than 1.0	1.0-1.9	2.0-4.9	5.0-9.9	10.0-19.9	20.0-29.9	30.0-39.9	40.0-49.9	50.0-74.9	75.0-99.9	100.0 or more	Total
	21,754	6,127	10,277	14,234	19,946	16,765	7,847	12,536	17,049	11,710	93,456	231,702

(a) Excludes ASIC Subdivision 16.

TABLE 9. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES, AUSTRALIA, 1981-82
R & D EXPENDITURE BY INDUSTRY OF ENTERPRISE BY SOURCE OF FUNDS AND BY TYPE OF R & D ACTIVITY
(\$' 000)

Industry of enterprise ASIC code Description		Source of funds(a)							Type of activity(a)				
		Total expenditure	Own funds	AIRDIB (b)	Other Commonwealth Government	State and local government	Other business enterprises	Private non-profit and other Australian (c)	Over-seas	Pure basic research	Strategic basic research	Applied research	Experimental development
C	Manufacturing	209,116	180,539	13,033	8,270	107	4,895	n.p.	n.p.	1,905	4,789	57,355	145,067
B, D-L	Mining and other industries	131,390	98,526	5,286	6,256	395	15,614	n.p.	n.p.	2,717	9,632	57,656	61,384
	Total all industries(d)	340,507	279,066	18,319	14,526	502	20,509	1,199	6,386	4,622	14,422	115,012	206,451
	Private business enterprise contribution to 'Total all industries'—												
	1981-82	285,686	228,196	18,183	11,368	400	19,961	1,194	6,386	4,354	9,629	89,696	182,009
	1978-79	205,814	161,237	12,953	7,513	774	13,870	851	8,616	3,443	4,224	61,721	136,428

(a) For further information see also Table 4. (b) Australian Industrial Research and Development Incentives Board. (c) Includes Higher Education Sector. (d) Excludes ASIC Division A.

TABLE 10. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES, AUSTRALIA, 1981-82
R & D MANPOWER BY INDUSTRY OF ENTERPRISE BY DETAILED ENTERPRISE EMPLOYMENT SIZE(a)
 (man-years)

Industry of enterprise		Enterprise employment size (persons)											
		Less than 10	10-19	20-49	50-99	100-199	200-499	500-999	1,000-1,999	2,000-4,999	5,000-9,999	10,000 or more	Total
ASIC code	Description												
C	Manufacturing	136	201	234	275	196	623	609	580	1,018	486	930	5,287
B, D-L	Mining and other industries	269	94	151	290	50	343	81	68	267	327	696	2,636
	Total all industries(b)	405	295	385	565	246	966	690	648	1,285	813	1,626	7,923

(a) For further information see also Table 5. (b) Excludes ASIC Division A.

TABLE 11. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES, AUSTRALIA, 1981-82
RESEARCHER EFFORT BY INDUSTRY OF ENTERPRISE BY STATE(a)
 (man-years)

Industry of enterprise		State									Total
		N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Overseas	
ASIC code	Description										
C	Manufacturing	863	986	128	194	46	47	—	7	10	2,280
B, D-L	Mining and other industries	387	432	176	57	93	40	n.p.	n.p.	2	1,192
	Total all industries(b)	1,249	1,418	304	252	139	87	n.p.	n.p.	12	3,472

(a) For further information see also Table 5. (b) Excludes ASIC Division A.

TABLE 12. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES,
AUSTRALIA, 1978-79 AND 1981-82
R & D EXPENDITURE BY INDUSTRY OF PRODUCT FIELD(a)

Industry of product field		1978-79		1981-82	
ASIC code	Description	Enterprises(b) number	R & D expenditure \$' 000	Enterprises(b) number	R & D expenditure \$' 000
	Agriculture, forestry, fishing and hunting—				
012.018	Sheep, grain, cattle, pigs and poultry	8	755	4	552
013-014,019-04	Other agriculture, forestry, fishing and hunting	15	1,623	8	766
A	Total agriculture, forestry, fishing and hunting	23	2,378	12	1,317
	Mining—				
11	Metallic minerals	14	5,201	17	16,311
12-15	Non-metallic minerals	24	6,849	18	18,690
11-15	Total mining (excl. services to mining)	36	12,050	34	35,002
	Manufacturing—				
211	Meat products	15	1,070	8	533
212	Milk products	15	1,497	18	2,382
213	Fruit and vegetable products	18	1,287	16	1,254
215-216	Flour and cereal products, bread, cakes and biscuits	20	3,042	22	4,612
214,217	Margarines, oils, fats and other food products	61	8,546	40	5,478
218-219	Beverages, malt and tobacco products	21	2,035	16	2,053
21	Total food, beverages and tobacco	109	17,477	90	16,311
234	Textile fibres, yarns and woven fabrics	12	1,039	n.p.	n.p.
235,24	Other textile products, clothing and footwear	16	778	n.p.	n.p.
23-24	Total textiles, clothing and footwear	27	1,817	16	1,064
25	Wood, wood products and furniture	35	1,866	30	2,609
263	Paper and paper products	15	2,750	n.p.	n.p.
264	Printing and allied industries	9	1,190	n.p.	n.p.
26	Total paper, paper products, printing and publishing	24	3,940	11	5,520
2751	Chemical fertilizers	6	981	12	1,813
2753	Synthetic resins and rubber	27	4,674	24	8,910
2754	Organic industrial chemicals n.e.c.	31	3,874	21	2,284
2755	Inorganic industrial chemicals n.e.c.	21	3,779	28	6,131
2762	Paints	32	4,534	29	6,613
2763	Veterinary products	17	5,941	24	4,175
2764	Pharmaceutical products	28	7,361	23	9,698
2765	Pesticides	19	4,626	16	6,229
2766	Soap and other detergents	28	1,667	25	2,265
2767	Cosmetics and toilet preparations	14	817	9	434
2752,2761,2768	Inks	5	726	7	734
275-276	Industrial gases, ammunition and other chemical products	39	2,843	39	5,087
	Total basic chemicals and other chemical products	212	41,823	186	54,374
277-278	Petroleum refining, petroleum and coal products n.e.c.	22	2,904	25	5,832
27	Total chemicals, petroleum and coal products	220	44,727	195	60,207
285	Glass and glass products	9	937	4	257
286	Clay products and refractories	15	781	19	2,438
287	Cement and concrete products	16	1,325	23	1,820
288	Other non-metallic mineral products	15	1,952	12	1,628
28	Total non-metallic mineral products	49	4,995	52	6,142
294	Basic iron and steel	43	8,798	29	13,579
295-296	Basic non-ferrous metals	29	4,409	36	10,610
29	Total basic metal products	71	13,207	63	24,189

For footnotes see end of table.

TABLE 12. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES,
AUSTRALIA, 1978-79 AND 1981-82
R & D EXPENDITURE BY INDUSTRY OF PRODUCT FIELD(a)—continued

Industry of product field		1978-79		1981-82	
ASIC code	Description	Enterprises(b)	R & D expenditure	Enterprises(b)	R & D expenditure
		number	\$'000	number	\$'000
314	Structural metal products	37	2,337	32	2,933
315	Sheet metal products	21	717	27	964
316	Other fabricated metal products	84	4,675	54	3,342
31	Total fabricated metal products	126	7,729	105	7,238
323	Motor vehicles and parts	69	17,411	70	32,717
3241-3242	Ships and boats	9	256	18	534
3243	Railway rolling stock and locomotives	6	1,249	8	1,478
3244	Aircraft	3	216	n.p.	n.p.
3245	Transport equipment n.e.c.	8	205	n.p.	n.p.
324	Total other transport equipment	26	1,927	36	3,704
32	Total transport equipment	93	19,337	103	36,422
334	Photographic, professional and scientific equipment	64	9,102	79	11,439
3351	Radio and T.V. receivers; audio equipment	12	1,513	11	665
3352	Automatic data processing equipment	41	5,214	62	7,852
3352	Telecommunications and broadcasting equipment	37	41,136	36	55,114
3353	Other electronic equipment	58	3,124	84	8,099
3353	Refrigerators and household appliances	48	4,646	35	3,858
3354	Water heating systems	31	1,867	27	2,304
3355-3357	Cables, batteries, and other electrical machinery and equipment	78	6,582	90	8,250
335	Total appliances and electrical equipment	254	46,082	306	86,143
3361	Agricultural machinery	44	4,998	66	6,322
3362	Construction machinery	18	958	18	848
3363	Materials handling equipment	44	2,312	31	1,483
3364	Wood and metal machinery	30	1,568	29	2,549
3365	Pumps and compressors	30	1,638	23	1,512
3366	Commercial space heating and cooling equipment	21	582	8	396
3367	Dies, blades and machine tool accessories	7	127	5	64
3368	Food processing machinery	21	818	19	1,417
3369	Industrial machinery and equipment n.e.c.	175	9,008	169	12,081
336	Total industrial machinery and equipment	327	22,009	323	26,672
33	Total other machinery and equipment	571	495,193	640	124,254
345	Leather and leather products	7	105	7	165
346	Rubber products	18	1,679	15	901
347	Plastic and related products	59	3,148	74	4,389
348	Other manufacturing	18	2,453	21	1,207
34	Total miscellaneous manufacturing	99	7,384	109	6,661
C	Total manufacturing	1,097	217,672	1,169	290,617
	Other industries—				
16	Services to mining n.e.c.	13	4,184	12	1,516
E	Construction	20	709	12	357
D, F-I	Other n.e.c.	173	48,847	50	11,697
16, D-L	Total other industries	194	13,740	73	13,570
	Total all industries(e)	1,186	245,841	1,246	346,587

(a) The industry of product (or process) field towards which the R & D activity was directed. For further explanation see paragraph 33 in the Explanatory notes. (b) Where the R & D performed by an enterprise was directed to more than one product, that enterprise is counted in each of the industries to which its products are keyed. Therefore, the enterprise counts shown in this table can not be summed to aggregates for combinations of industries. (c) ASIC Divisions A-1..

TABLE 13. RESEARCH AND EXPERIMENTAL DEVELOPMENT CARRIED OUT BY BUSINESS ENTERPRISES,
AUSTRALIA, 1981-82
R & D EXPENDITURE BY INDUSTRY OF PRODUCT FIELD(a) BY STATE
(\$'000)

Industry of product field		State						
		N.S.W.	Vic.	Qld	S.A.	W.A.	Tas., N.T. and A.C.T.	Total
11-15	Mining (excl. services to mining)	13,849	2,352	13,360	2,550	n.p.	n.p.	35,002
	Manufacturing—							
21	Food, beverages and tobacco	4,815	6,261	3,621	1,158	284	172	16,311
23-24	Textiles, clothing and footwear	297	602	—	n.p.	—	n.p.	1,064
25	Wood, wood products and furniture	n.p.	1,012	315	76	n.p.	n.p.	2,609
26	Paper, paper products, printing and publishing	n.p.	3,799	—	n.p.	n.p.	n.p.	5,520
2763	Pharmaceutical and veterinary products	6,017	7,282	3,661	1,347	627	1,149	13,873
(b)	Chemicals, petroleum and coal products	11,673	28,452					
28	Non-metallic mineral products	3,991	1,322	331	186	n.p.	n.p.	6,142
29	Basic metal products	10,801	5,474	1,050	1,917	827	4,121	24,189
31	Fabricated metal products	4,598	1,714	267	489	n.p.	n.p.	7,238
32	Transport equipment	3,917	25,347	464	3,965	2,705	24	36,422
334	Photographic, professional and scientific equipment	4,204	4,392	484	2,132	94	133	11,439
335	Appliances and electrical equipment	24,679	55,289	770	2,970	1,962	474	86,143
336	Industrial machinery and equipment	8,117	8,313	3,901	2,492	3,529	320	26,672
33	Total other machinery and equipment	37,000	67,994	5,155	7,594	5,585	927	124,254
34	Miscellaneous manufacturing	2,202	2,543	879	692	n.p.	n.p.	6,661
C	Total manufacturing	86,362	151,802	15,743	17,550	10,692	8,468	290,617
A, 16, D-L	Agriculture and other industries	6,351	6,496	544	74	n.p.	n.p.	14,888
	Total all Industries(c) 1981-82	106,560	160,650	29,647	20,172	14,515	8,962	340,507
	Total all Industries 1978-79	90,624	106,242	20,690	15,527	5,887	6,871	245,841

(a) The industry of product (or process) field towards which the R & D activity was directed. For further explanation see paragraph 33 in the Explanatory notes.
(b) ASIC Subdivision 27 excluding ASIC Class 2763. (c) ASIC Divisions A-L.

TABLE 14. EXTRAMURAL R & D EXPENDITURE: EXPENDITURE BY BUSINESS ENTERPRISES
ON R & D CARRIED OUT BY OTHERS-AUSTRALIA, 1981-82
PAYMENTS BY INDUSTRY OF ENTERPRISE MAKING PAYMENT BY LOCATION OF RECIPIENT

Industry of enterprise making payment		Location of recipient				Total	
		Australia		Overseas		Enter-prises	Pay-ments
		Enter-prises	Pay-ments	Enter-prises	Pay-ments		
ASIC code	Description	number	\$' 000	number	\$' 000	number	\$' 000
11-15	Mining (excl. services to mining)	n.p.	n.p.	n.p.	n.p.	17	5,465
	Manufacturing—						
21	Food, beverages and tobacco	17	1,512	—	—	17	1,512
23-24	Textiles, clothing and footwear	n.p.	n.p.	n.p.	n.p.	5	254
25	Wood, wood products and furniture	n.p.	n.p.	—	—	n.p.	n.p.
26	Paper, paper products, printing and publishing	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
2763	Pharmaceutical and veterinary products	15	1,138	4	162	15	1,300
(a)	Chemicals, petroleum and coal products	21	4,022	4	402	25	4,424
28	Non-metallic mineral products	6	224	—	—	6	224
29	Basic metal products	9	801	3	135	11	936
31	Fabricated metal products	15	435	—	—	15	435
32	Transport equipment	n.p.	n.p.	n.p.	n.p.	11	269
334-335	Photographic, professional and scientific equipment and appliances and electrical equipment	28	1,199	5	327	31	1,526
336	Industrial machinery and equipment	14	223	4	241	17	464
33	Total other machinery and equipment	42	1,422	9	568	48	1,990
34	Miscellaneous manufacturing	n.p.	n.p.	n.p.	n.p.	16	1,323
C	Total manufacturing	n.p.	n.p.	n.p.	n.p.	176	12,800
	Other industries—						
F	Wholesale and retail trade	n.p.	n.p.	n.p.	n.p.	32	7,154
63	Property and business services	n.p.	n.p.	n.p.	n.p.	34	2,132
(b)	Other n.e.c.	39	5,399	9	6,467	41	11,865
16, D-L	Total other industries	102	11,484	12	9,686	107	21,170
	Total all industries(c)	279	26,279	40	13,157	300	39,436
	Private business enterprise contribution to						
	Total all industries—						
	1981-82	245	19,326	37	12,697	265	32,023
	1978-79	234	12,676	36	4,286	247	16,962

(a) ASIC Subdivision 27 excluding ASIC Class 2763. (b) ASIC codes 16, D-E, G-H, 61-62, J-L. (c) Excludes ASIC Division A.

TABLE 15. EXTRAMURAL R & D EXPENDITURE: EXPENDITURE BY BUSINESS ENTERPRISES ON R & D
CARRIED OUT BY OTHERS-AUSTRALIA, 1981-82
PAYMENTS BY COUNTRY OF RECIPIENT BY RELATIONSHIP OF RECIPIENT TO ENTERPRISE MAKING PAYMENT
(\$' 000)

Country of recipient	Relationship of recipient to enterprise making payment	Industry of enterprise making payment		Total all industries(c)
		Manufacturing(a)	Mining and other industries(b)	
U.K.	Related enterprises	n.p.	n.p.	198
	Unrelated organisations	897	—	897
	Total	n.p.	n.p.	1,095
U.S.A.	Related enterprises	n.p.	n.p.	3,851
	Unrelated organisations	n.p.	n.p.	4,082
	Total	683	7,048	7,933
Other overseas	Related enterprises	206	220	426
	Unrelated organisations	n.p.	n.p.	3,703
	Total	n.p.	n.p.	4,129
Total overseas	Related enterprises	n.p.	n.p.	4,476
	Unrelated organisations	1,828	6,853	8,682
	Total	n.p.	n.p.	13,157
Australia	Related enterprises	n.a.	n.a.	n.a.
	Unrelated organisations	n.a.	n.a.	n.a.
	Total	10,637	15,642	26,279
Total	Related enterprises	n.a.	n.a.	n.a.
	Unrelated organisations	n.a.	n.a.	n.a.
	Total	12,800	26,636	39,436
	Private business enterprise contribution to			
	Total all industries—			
	1981-82	n.p.	n.p.	32,023
	1978-79	9,354	7,608	16,962

(a) ASIC Division C. (b) ASIC Divisions B, D-L. (c) Excludes ASIC Division A.

TABLE 16. PAYMENTS AND RECEIPTS FOR TECHNICAL KNOW-HOW BY BUSINESS ENTERPRISES(a), AUSTRALIA
 PAYMENTS AND RECEIPTS BY INDUSTRY OF ENTERPRISE(b)
 (\$ m)

Industry of enterprise(b)		Payments for technical know-how			Receipts for technical know-how		
ASIC code	Description	1976-77	1978-79	1981-82	1976-77	1978-79	1981-82
Manufacturing—							
21	Food, beverages and tobacco	2.9	4.0	14.9	0.3	0.4	—
23-24	Textiles, clothing and footwear	1.4	1.2	1.4	n.p.	n.p.	—
25	Wood, wood products and furniture	0.1	1.2	1.2	n.p.	n.p.	—
26	Paper, paper products, printing and publishing	0.5	1.2	1.2	n.p.	n.p.	—
27	Chemicals, petroleum and coal products	16.1	27.4	36.3	2.4	3.2	n.p.
28	Non-metallic mineral products	4.0	4.4	5.6	0.7	0.9	n.p.
29	Basic metal products	3.1	4.0	7.6	1.2	0.6	2.0
31	Fabricated metal products	1.4	1.4	3.3	0.8	1.3	0.7
32	Transport equipment	7.1	10.1	10.8	0.3	0.5	2.0
334,335	Photographic, professional and scientific equipment and appliances and electrical equipment	12.4	18.6	11.7	0.6	0.9	1.3
336	Industrial machinery and equipment	3.8	3.3	3.2	0.6	0.2	0.2
33	Total other machinery and equipment	16.2	21.9	14.9	1.2	1.1	1.5
34	Miscellaneous manufacturing	3.1	3.9	3.3	0.5	0.5	0.9
C	Total manufacturing	55.8	79.5	99.2	7.5	8.8	11.5
(c)	Other industries	13.7	29.1	27.4	1.7	6.6	5.9
	Total all industries	69.5	108.6	126.6	9.2	15.4	17.4

(a) Excludes enterprises in ASIC Division A. (b) 1978-79 and 1981-82 data are classified by the 1978 edition of ASIC; 1976-77 data are classified by the 1969 edition of ASIC. If the 1978 edition were used to classify the 1976-77 data shown here only minor differences would occur. (c) ASIC Divisions B, D-L.

TABLE 17. PAYMENTS BY BUSINESS ENTERPRISES FOR TECHNICAL KNOW-HOW, AUSTRALIA, 1981-82
PAYMENTS BY INDUSTRY OF ENTERPRISE

Industry of enterprise making payment		Enterprises making payments	Type of technical know-how			Payments made overseas						
			Total payments	Patent licence fees and royalties	Other technical know-how	Payments within Australia	Total payments made overseas	Relationship of recipient to enterprise making payment		Country to which payment made(a)		
								Related enterprise	Unrelated organisation	U.K.	U.S.A.	Other overseas
ASIC code	Description	number	\$' 000	\$' 000	\$' 000	\$' 000	\$' 000	\$' 000	\$' 000	\$' 000	\$' 000	\$' 000
	Manufacturing—											
21	Food, beverages and tobacco	15	14,864	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
23-24	Textiles, clothing and footwear	6	1,398	n.p.	n.p.	—	1,398	1,202	196	—	n.p.	n.p.
25	Wood, wood products and furniture	6	1,201	340	861	—	1,201	1,123	78	67	1,134	—
26	Paper, paper products, printing and publishing											
2763	Pharmaceutical and veterinary products	11	9,547	7,670	1,877	405	35,911	29,758	6,153	7,193	20,934	7,785
(b)	Chemicals, petroleum and coal products	36	26,769	16,844	9,925	—	5,577	4,895	681	4,708	304	564
28	Non-metallic mineral products	10	5,577	n.p.	n.p.	—	5,577	4,895	n.p.	n.p.	n.p.	n.p.
29	Basic metal products	11	7,603	4,817	2,786	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
31	Fabricated metal products	23	3,277	782	2,495	244	3,032	599	2,434	168	1,848	1,017
32	Transport equipment	17	10,835	5,858	4,977	134	10,701	6,835	3,866	700	2,104	7,896
334,335	Photographic, professional and scientific equipment and appliances and electrical equipment	38	11,666	3,183	8,482	190	11,476	8,842	2,633	n.p.	6,066	n.p.
336	Industrial machinery and equipment	28	3,215	1,838	1,378	29	3,187	1,992	1,194	n.p.	2,849	n.p.
33	Total other machinery and equipment	66	14,881	5,021	9,860	219	14,662	10,834	3,827	2,028	8,915	3,720
34	Miscellaneous manufacturing	18	3,253	475	2,778	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
C	Total manufacturing	219	99,204	58,085	41,119	2,193	97,010	71,862	25,149	15,969	45,363	35,679
	Mining and other industries—											
F	Wholesale and retail trade	28	13,076	3,027	10,050	96	12,980	12,376	604	2,205	8,139	2,637
(c)	Mining and other n.e.c.	37	14,304	8,315	5,989	209	14,095	9,180	4,914	365	11,736	1,994
B, D-L	Total mining and other industries	65	27,380	11,341	16,039	305	27,075	21,556	5,519	2,569	19,875	4,630
	Total all industries(d)	284	126,584	69,426	57,158	2,499	124,085	93,418	30,668	18,539	65,238	40,309
	Private business enterprise contribution to 'Total all industries'—											
	1981-82	280	126,395	69,419	56,976	2,471	123,924	93,418	30,506	18,538	65,090	40,297
	1978-79	346	108,317	49,392	58,925	1,766	106,551	78,982	27,569	17,206	59,200	30,145

(a) For further information see also Table 18. (b) ASIC Subdivision 27 excluding ASIC Class 2763. (c) ASIC Divisions B, D-E, G-L. (d) Excludes ASIC Division A.

TABLE 18. PAYMENTS BY BUSINESS ENTERPRISES FOR TECHNICAL KNOW-HOW, AUSTRALIA, 1981-82
PAYMENTS BY COUNTRY OF RECIPIENT(a)
(\$' 000)

	<i>Australia</i>	<i>Canada</i>	<i>Federal Republic of Germany</i>	<i>France</i>	<i>Japan</i>	<i>U.K.</i>	<i>U.S.A.</i>	<i>Other countries</i>	<i>Total</i>
Total all industries(b)	2,499	368	6,662	1,792	6,699	18,539	65,238	24,787	126,584
Private business enterprise contribution to 'Total all industries'—									
1981-82	2,471	367	6,662	1,792	6,698	18,538	65,090	24,777	126,395
1978-79	1,766	1,234	10,514	2,958	3,542	17,206	59,200	11,897	108,317

(a) For further information see also Table 17. (b) Excludes ASIC Division A.

TABLE 19. RECEIPTS BY BUSINESS ENTERPRISES FOR TECHNICAL KNOW-HOW, AUSTRALIA, 1981-82
RECEIPTS BY INDUSTRY OF ENTERPRISE

<i>Industry of recipient enterprise</i> <i>ASIC code Description</i>		<i>Receipts from overseas</i>									
		<i>Type of technical know-how</i>			<i>Receipts from within Australia</i>	<i>Total receipts from overseas</i>	<i>Relationship of organisation making payments to recipient enterprise</i>		<i>Country from which payment received(a)</i>		
		<i>Recipient enterprises</i>	<i>Patent licence fees and royalties</i>	<i>Other technical know-how</i>			<i>Related enterprise</i>	<i>Unrelated organisation</i>	<i>U.K.</i>	<i>U.S.A.</i>	<i>Other overseas</i>
		<i>number</i>	<i>\$' 000</i>	<i>\$' 000</i>	<i>\$' 000</i>	<i>\$' 000</i>	<i>\$' 000</i>	<i>\$' 000</i>	<i>\$' 000</i>	<i>\$' 000</i>	<i>\$' 000</i>
C	Manufacturing	77	11,481	8,065	3,416	1,927	9,554	4,150	5,404	n.p.	6,457
B,D-L	Mining and other industries	57	5,911	1,587	4,324	3,249	2,662	970	1,692	n.p.	2,371
	Total all industries(b)	134	17,393	9,653	7,740	5,177	12,216	5,120	7,096	476	8,828
	Private business enterprise contribution to 'Total all industries'—										
	1981-82	130	17,346	9,629	7,718	5,150	12,196	5,120	7,076	476	8,828
	1978-79	148	13,878	5,322	8,557	2,305	11,573	5,867	5,706	1,389	7,556

(a) For further information see also Table 20. (b) Excludes ASIC Division A.

TABLE 20. RECEIPTS BY BUSINESS ENTERPRISES FOR TECHNICAL KNOW-HOW, AUSTRALIA, 1981-82
RECEIPTS BY COUNTRY FROM WHICH PAYMENT WAS RECEIVED(a)
(\$' 000)

	<i>Australia</i>	<i>Canada</i>	<i>Federal Republic of Germany</i>	<i>France</i>	<i>Japan</i>	<i>New Zealand</i>	<i>U.K.</i>	<i>U.S.A.</i>	<i>Other countries</i>	<i>Total</i>
Total all industries(b)	5,177	394	324		819	1,687	476	2,912	5,604	17,393
Private business enterprise contribution to 'Total all industries'—										
1981-82	5,150	394	324		819	1,687	476	2,892	5,604	17,346
1978-79	2,305	208	211		477	2,062	1,389	2,628	4,598	13,878

(a) For further information see also Table 19. (b) Excludes ASIC Division A.

TABLE 21. PATENT ACTIVITY BY BUSINESS ENTERPRISES WITH RESEARCH AND EXPERIMENTAL DEVELOPMENT ACTIVITY IN 1981-82, AUSTRALIA, JULY 1979—JUNE 1982
DETAILS BY INDUSTRY OF ENTERPRISE

Industry of enterprise with patent activity ASIC code Description		Number of enterprises with patent activity during the period July 1979—June 1982				Patent activity during the period July 1979—June 1982			
		Enterprises lodging patent applications in Australia	Enterprises with patents granted in Australia	Enterprises lodging patent applications overseas	Enterprises with patents granted overseas	Patent applications lodged in Australia	Patents granted in Australia	Patent applications lodged overseas	Patents granted overseas
	Manufacturing—								
21	Food, beverages and tobacco	9	4	5	4	18	11	31	25
23-24	Textiles, clothing and footwear	4	n.p.	3	n.p.	10	n.p.	15	n.p.
25	Wood, wood products and furniture	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
26	Paper, paper products, printing and publishing	n.p.	3	n.p.	3	n.p.	13	n.p.	25
2763	Pharmaceutical and veterinary products	6	3	n.p.	n.p.	15	11	n.p.	n.p.
(a)	Chemicals, petroleum and coal products	22	12	16	n.p.	92	62	722	210
28	Non-metallic mineral products	5	3	n.p.	n.p.	13	8	n.p.	n.p.
29	Basic metal products	8	8	6	7	54	34	192	170
31	Fabricated metal products	30	20	16	14	153	52	102	50
32	Transport equipment	14	7	6	n.p.	45	19	122	n.p.
334-335	Photographic, professional and scientific equipment and appliances and electrical equipment					197	114	430	179
336	Industrial machinery and equipment	48	29	26	18	228	89	420	296
33	Total other machinery and equipment	53	33	37	25	425	203	850	475
34	Miscellaneous manufacturing n.e.c.	101	62	63	43				
		19	15	12	9	53	26	173	131
C	Total manufacturing	222	140	134	99	915	456	2,310	1,198
	Mining and other industries—								
F	Wholesale and retail trade	30	12	14	7	65	28	64	37
63	Property and business services	41	24	30	21	103	39	419	192
(b)	Mining and other n.e.c.	26	17	12	10	66	37	140	100
B, D-L	Total mining and other industries	97	53	56	38	234	104	623	329
	Total all industries(c)	319	193	190	137	1,149	560	2,933	1,527

(a) ASIC Subdivision 27 excluding ASIC Class 2763. (b) ASIC codes B, D-E, G-H, 61-62, K-L. (c) Excludes ASIC Division A.