



RESEARCH AND EXPERIMENTAL DEVELOPMENT, BUSINESSES AUSTRALIA

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INQUIRIES

For further information about these and related statistics, contact the National Information and Referral Service on 1300 135 070 or Kirsty Rothenbury on Perth (08) 9360 5382.

NOTES

CHANGES IN THIS ISSUE

From 2005–06, the survey scope has been altered to:

- Include businesses classified to Division A (Agriculture, forestry and fishing) of the *Australian and New Zealand Standard Industrial Classification (ANZSIC), 1993* (cat. no. 1292.0); and
- Exclude businesses with expenditure on R&D of less than \$100,000 in the reference period.

For further detail on the changes to survey scope, see paragraph 15–16 of the Explanatory Notes.

Type of activity data are now collected on an annual basis (previously every two years) and are included in this publication for the 2004–05 and 2005–06 reference periods.

With the release of this issue, time series spreadsheets of publication level data have been made available from the ABS web site <<http://www.abs.gov.au>>.

DATA QUALITY

When interpreting the results in this publication it is important to take into account factors that may affect the reliability of estimates. These factors are described in the Non-sampling error section in the Technical Note.

There have been revisions to 2003–04 and 2004–05 data this cycle. See the Revisions section of the Technical Note for further detail.

Denis Farrell
Acting Australian Statistician

ABBREVIATIONS

\$'000	thousand dollars
\$m	million dollars
ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
ANZSIC	Australian and New Zealand Standard Industrial Classification
ATO	Australian Taxation Office
BERD	business expenditure on R&D
GDP	gross domestic product
GSP	gross state product
n.e.c.	not elsewhere classified
NSW	New South Wales
NT	Northern Territory
OECD	Organisation for Economic Co-operation and Development
PYE	person years of effort
Qld	Queensland
R&D	research and experimental development
RFCD	research fields, courses and disciplines
SA	South Australia
SEO	socio-economic objective
Tas.	Tasmania
Vic.	Victoria
WA	Western Australia

MAIN FEATURES

EXPENDITURE ON RESEARCH AND EXPERIMENTAL DEVELOPMENT (R&D)

Business expenditure on R&D (BERD) in Australia during 2005–06 was \$10,080.7 million. This represented an increase of 16.6% in current price terms over 2004–05 and 11.8% in chain volume terms and was the seventh successive year of increase.

RESOURCES DEVOTED TO R&D

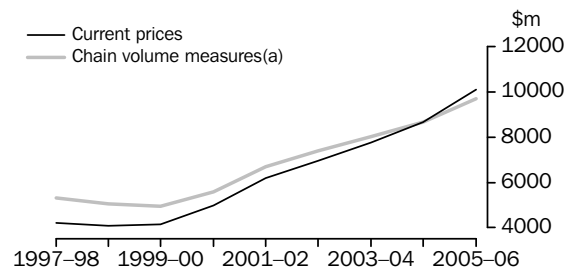
		2001–02	2002–03	2003–04	2004–05	2005–06
Expenditure on R&D						
Current prices	\$m	6 191.9	6 940.3	r7 769.9	r8 654.6	10 080.7
Chain volume measures(a)	\$m	6 702.7	7 397.3	8 036.9	8 654.6	9 679.8
Human resources devoted to R&D	PYE	32 209	35 939	r37 430	r40 417	42 837

r revised

(a) The reference year for chain volume measures is 2004–05. See paragraph 22 of the Explanatory Notes.

Over the five years to 2005–06, BERD increased by an average of 12.6% per year in current price terms and 8.9% per year in chain volume terms.

BUSINESS EXPENDITURE ON R&D

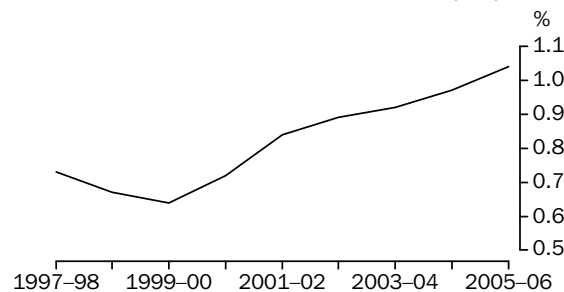


(a) Reference year for chain volume measures is 2004–05. See paragraph 22 of the Explanatory Notes.

Proportion of GDP

BERD increased as a proportion of GDP between 2004–05 and 2005–06, moving from 0.97% to 1.04%. This was the first time that the ratio of BERD to GDP exceeded 1.0%.

BUSINESS EXPENDITURE ON R&D, proportion of GDP(a)



(a) See paragraph 2 of the Explanatory Notes.

Although Australia remained below the OECD average of 1.53%, it recorded one of the largest increases in BERD/GDP ratio of all OECD countries between 2004–05 and 2005–06. The following table shows BERD/GDP ratios for selected OECD countries.

MAIN FEATURES *continued*

*Proportion of GDP
continued*

BERD/GDP RATIOS OF OECD COUNTRIES (a)

	2001-02	2002-03	2003-04	2004-05	2005-06
	%	%	%	%	%
Sweden	3.28	na	2.93	2.73	2.88
Japan	2.30	2.36	2.40	2.38	2.54
Finland	2.35	2.34	2.42	2.42	2.47
Korea	1.97	1.90	2.00	2.18	2.30
United States of America	2.00	1.86	1.84	1.79	1.82
Germany	1.72	1.72	1.76	1.74	1.71
Denmark	1.64	1.73	1.78	1.70	1.67
Austria	na	1.42	na	1.51	1.64
Iceland	1.75	1.71	1.48	na	1.45
Luxembourg	na	na	1.48	1.46	1.34
France	1.39	1.41	1.36	1.34	1.32
Belgium	1.51	1.37	1.31	1.29	1.24
United Kingdom	1.20	1.19	1.14	1.09	1.10
Canada	1.29	1.17	1.13	1.12	1.07
Australia	0.84	0.89	0.92	0.97	1.04
Netherlands	1.05	0.98	1.01	1.03	1.02
Czech Republic	0.72	0.73	0.76	0.80	0.92
Ireland	0.77	0.76	0.80	0.82	0.83
Norway	0.95	0.95	0.98	0.87	0.82
Spain	0.48	0.54	0.57	0.58	0.61
Italy	0.53	0.54	0.52	0.52	0.55
New Zealand	0.42	na	0.49	na	na
Hungary	0.37	0.35	0.34	0.36	0.41
Portugal	0.26	0.25	0.24	0.27	0.29
Slovak Republic	0.43	0.37	0.32	0.25	0.25
Mexico	0.12	0.15	0.15	0.22	0.25
Poland	0.22	0.11	0.15	0.16	0.18
Turkey	0.24	0.19	0.14	0.16	na
Greece	0.17	0.16	0.16	0.15	0.14
Total OECD	1.57	1.51	1.51	1.49	1.53

na not available

(a) Ranked by 2005–06 BERD/GDP ratio.

Source: *Main Science and Technology Indicators, 2007/1*, OECD, Paris, 2007

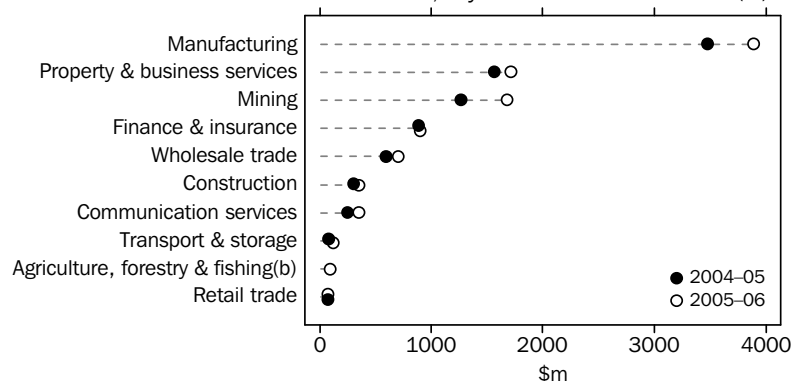
Industry

In 2005–06, the largest contributors to BERD were Manufacturing (\$3,888.7 million or 38.6% of BERD), Property and business services (\$1,717.0 million or 17.0%) and Mining (\$1,683.4 million or 16.7%). Of all industries, Mining and Manufacturing reported the largest absolute growth from 2004–05, increasing their expenditure on R&D by \$417.2 million (33.0%) and \$416.5 million (12.0%) respectively. Other industries to record large increases included Property and business services (up \$151.1 million or 9.6%) and Wholesale trade (up \$105.9 million or 17.8%).

MAIN FEATURES *continued*

Industry continued

BUSINESS EXPENDITURE ON R&D, by selected industries(a)



(a) Ranked by 2005-06 expenditure.
 (b) Data not collected in 2004-05.

Type of expenditure

As in previous years, BERD in 2005-06 was mainly comprised of Current expenditure (\$9,439.7 million or 93.6% of BERD). Current expenditure was in turn comprised of \$3,886.8 million in Labour costs and \$5,553.0 million in Other current expenditure. Capital expenditure in 2005-06 totalled \$641.0 million.

Retail trade had the highest level of Labour costs as a proportion of BERD (56.5%), while Mining and Construction reported the lowest levels (at 16.0% and 18.9% respectively).

At \$289.8 million, Manufacturing accounted for 45.2% of all Capital expenditure on R&D in 2005-06. The next highest level of Capital expenditure was reported by Mining at \$100.2 million.

Source of funds

The Business sector was the main source of R&D funds in 2005-06, with \$9,191.8 million (91.2%) coming from Own funds and \$223.3 million (2.2%) from Other businesses. Commonwealth government and Overseas organisations were the next largest funders of R&D, at \$396.4 million (3.9%) and \$177.6 million (1.8%) respectively.

Property and business services and Health and community services had the lowest proportions of self-funded research, at 76.5% and 78.2% respectively.

Type of activity

In 2005-06, the majority of R&D activity was directed into Experimental development (62.4% or \$6,288.8 million) and Applied research (32.9% or \$3,312.1 million). Applied research showed the largest growth between 2004-05 and 2005-06, increasing by 15.4% or \$485.4 million.

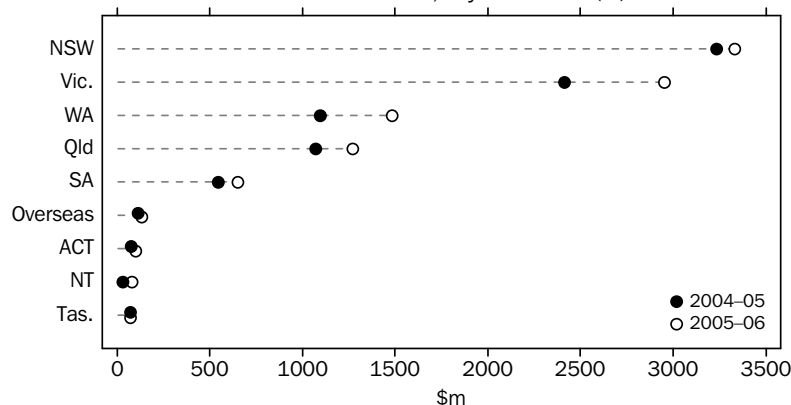
Location

Locations in New South Wales and Victoria continued to record the highest levels of BERD in 2005-06, at \$3,331.3 million (33.0%) and \$2,954.4 million (29.3%) respectively. Victoria also reported the highest level of growth in BERD (up \$541.7 million or 22.5%), between 2004-05 and 2005-06, followed by Western Australia (up \$392.7 million or 35.9%) and Queensland (up \$201.0 million or 18.8%).

MAIN FEATURES *continued*

Location continued

BUSINESS EXPENDITURE ON R&D, by location(a)



(a) Ranked by 2005–06 expenditure.

Making the largest contribution to BERD in Victoria and New South Wales, in 2005–06, was Manufacturing, with expenditure on R&D in each state of \$1,486.6 million (50.3%) and \$1,004.1 million (30.1%) respectively. While Manufacturing was also the largest contributor to R&D expenditure in Queensland (\$444.0 million or 34.9%), Mining was the most dominant industry in Western Australia (\$703.7 million or 47.4%).

Victoria (1.27%) and Western Australia (1.25%) also reported the highest state percentages of BERD as a proportion of Gross State Product (GSP).

BUSINESS EXPENDITURE ON R&D, by location—proportion of GSP(a)

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT
	%	%	%	%	%	%	%	%
2003–04	1.02	1.02	0.65	1.02	0.86	0.50	0.76	0.37
2004–05	1.06	1.09	0.67	0.92	1.07	0.45	0.29	0.42
2005–06	1.04	1.27	0.70	1.04	1.25	0.42	0.64	0.51

(a) See paragraph 2 of the Explanatory Notes.

Employment size

In 2005–06, businesses with 200 or more employees made the largest contribution to BERD (\$6,738.2 million or 66.8%), followed by those with 20–199 employees (\$2,026.5 million or 20.1%). Making the smallest contribution to BERD were businesses with 0–4 employees (\$354.0 million or 3.5%) and those with 5–19 employees (\$962.0 million or 9.5%). Businesses with 200 or more employees contributed 70.1% (\$1,004.7 million) of the total growth in BERD between 2004–05 and 2005–06.

Socio-economic objectives (SEO)

Much of the growth in BERD, between 2004–05 and 2005–06, occurred in the Energy resources (up \$324.6 million), Manufacturing (up \$292.8 million) and Mineral resources (up \$224.2 million) SEOs. Together these three SEOs accounted for 58.8% of the total growth in BERD over the period.

MAIN FEATURES *continued*

Research fields

Accounting for 82.7% of BERD in 2005–06 were the Research fields of Engineering and technology (\$5,856.6 million or 58.1%) and Information, computing and communication sciences (\$2,484.8 million or 24.6%). The largest growth in expenditure within these Research fields, between 2004–05 and 2005–06, was recorded for Resource engineering (up \$466.8 million or 45.2%) and Computer software (up \$191.1 million or 20.0%).

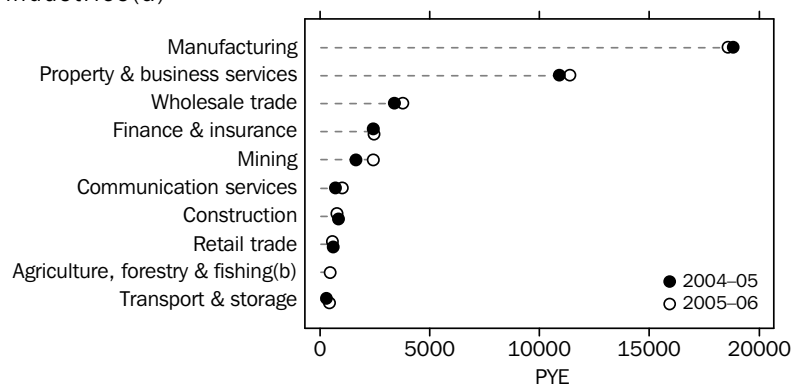
HUMAN RESOURCES DEVOTED TO R&D

Human resources devoted to R&D in 2005–06 totalled 42,837 person years of effort (PYE), an increase of 6.0% over 2004–05.

Industry

In 2005–06, Manufacturing and Property and business services were the main contributors to total Human resources devoted to R&D, at 43.3% and 26.5% respectively. Mining and Property and business services recorded the largest increases in Human resources devoted to R&D from 2004–05, increasing by 782 PYE (47.2%) and 450 PYE (4.1%) respectively.

BUSINESS HUMAN RESOURCES DEVOTED TO R&D, by selected industries(a)



(a) Ranked by 2005–06 total human resources.
 (b) Data not collected in 2004–05.

Type of resource

Researchers continued to be the main type of human resource devoted to R&D (53.9% of total PYE) in 2005–06. However, Technicians reported the largest growth, between 2004–05 and 2005–06, increasing by 1,478 PYE or 12.3%.

Employment size

Businesses with 200 or more employees accounted for 23,914 PYE (55.8%) of total Human resources devoted to R&D in 2004–05, while those with 0–4 employees contributed 1,392 PYE (3.2%).

EXPENDITURE ON R&D(a), summary statistics

	EXPENDITURE ON R&D			PROPORTION OF TOTAL EXPENDITURE ON R&D		
	2003-04	2004-05	2005-06(b)	2003-04	2004-05	2005-06(b)
	\$'000	\$'000	\$'000	%	%	%
Type of expenditure						
Capital expenditure						
Land, buildings & other structures	91 614	99 761	107 235	1.2	1.2	1.1
Other capital expenditure	415 615	448 759	533 737	5.3	5.2	5.3
<i>Total</i>	<i>507 229</i>	<i>548 521</i>	<i>640 972</i>	<i>6.5</i>	<i>6.3</i>	<i>6.4</i>
Current expenditure						
Labour costs	2 999 323	3 443 917	3 886 767	38.6	39.8	38.6
Other current expenditure	4 263 402	4 655 812	5 552 964	54.9	53.8	55.1
<i>Total</i>	<i>7 262 725</i>	<i>8 099 729</i>	<i>9 439 731</i>	<i>93.5</i>	<i>93.7</i>	<i>93.6</i>
Source of funds						
Own funds	7 073 558	7 839 066	9 191 819	91.0	90.6	91.2
Other businesses	187 102	194 968	223 273	2.4	2.3	2.2
Commonwealth government	282 507	335 425	396 401	3.6	3.9	3.9
State and local government	27 729	30 612	32 236	0.4	0.4	0.3
Other Australian(c)	56 926	50 588	59 403	0.7	0.6	0.6
Overseas	142 133	197 590	177 571	1.8	2.3	1.8
Location of expenditure						
New South Wales	2 960 928	3 233 024	3 331 334	38.1	37.4	33.0
Victoria	2 163 832	2 412 769	2 954 439	27.8	27.9	29.3
Queensland	940 293	1 071 617	1 272 651	12.1	12.4	12.6
South Australia	584 258	545 358	653 102	7.5	6.3	6.5
Western Australia	791 352	1 092 407	1 485 071	10.2	12.6	14.7
Tasmania	73 512	72 075	72 912	0.9	0.8	0.7
Northern Territory	71 698	30 857	78 039	0.9	0.4	0.8
Australian Capital Territory	65 569	78 419	99 221	0.8	0.9	1.0
Australian External Territories	2 066	—	—	—	—	—
Overseas	116 446	111 723	133 933	1.5	1.3	1.3
Employment size						
0-4 persons	342 901	298 866	354 031	4.4	3.5	3.5
5-19 persons	776 175	831 582	961 988	10.0	9.6	9.5
20-199 persons	1 747 920	1 784 295	2 026 485	22.5	20.6	20.1
200 or more persons	4 902 958	5 733 506	6 738 199	63.1	66.3	66.8
Type of activity						
Pure basic research	na	58 586	67 093	na	0.7	0.7
Strategic basic research	na	309 402	412 658	na	3.6	4.1
Applied research	na	2 826 683	3 312 113	na	32.7	32.9
Experimental development	na	5 453 579	6 288 838	na	63.1	62.4
Total expenditure on R&D	7 769 954	8 648 249	10 080 703	100.0	100.0	100.0

— nil or rounded to zero (including null cells)

na not available

(a) 2003-04 and 2004-05 data have been revised. See the Revisions section of the Technical Note for further detail.

(b) Businesses classified to Agriculture, forestry and fishing are in scope of the survey from 2005-06 and may impact the comparability of previous data.

(c) Includes funding from Joint government/business, Higher education and Private non-profit organisations.

EXPENDITURE ON R&D(a), by industry—values and proportions

	EXPENDITURE ON R&D			PROPORTION OF TOTAL EXPENDITURE ON R&D		
	2003-04	2004-05	2005-06	2003-04	2004-05	2005-06
	\$'000	\$'000	\$'000	%	%	%
Agriculture, forestry & fishing	na	na	95 579	na	na	0.9
Mining	1 026 333	1 266 152	1 683 399	13.2	14.6	16.7
Manufacturing						
Food, beverage & tobacco	305 070	343 679	331 350	3.9	4.0	3.3
Textile, clothing, footwear & leather	40 880	35 121	38 537	0.5	0.4	0.4
Wood & paper product	118 310	107 870	121 391	1.5	1.2	1.2
Printing, publishing & recorded media	45 384	71 170	92 919	0.6	0.8	0.9
Petroleum, coal, chemical & assoc. product	550 058	597 754	707 197	7.1	6.9	7.0
Non-metallic mineral product	96 767	69 890	103 880	1.2	0.8	1.0
Metal product	366 902	418 302	628 778	4.7	4.8	6.2
Machinery & equipment						
Motor vehicle & part	638 570	607 903	654 204	8.2	7.0	6.5
Other transport equipment	177 762	195 427	268 532	2.3	2.3	2.7
Photographic & scientific equip.	302 588	319 791	222 885	3.9	3.7	2.2
Electronic equipment	377 249	371 100	410 598	4.9	4.3	4.1
Electrical equipment & appliance	119 211	99 053	76 115	1.5	1.1	0.8
Industrial machinery & equipment	196 669	174 731	170 717	2.5	2.0	1.7
Total	1 812 049	1 768 004	1 803 051	23.3	20.4	17.9
Other manufacturing	39 920	60 430	61 639	0.5	0.7	0.6
Total	3 375 340	3 472 220	3 888 742	43.4	40.1	38.6
Electricity, gas & water supply	67 870	69 215	58 670	0.9	0.8	0.6
Construction	219 971	303 622	353 288	2.8	3.5	3.5
Wholesale trade	481 033	596 624	702 566	6.2	6.9	7.0
Retail trade	56 000	73 795	74 416	0.7	0.9	0.7
Accommodation, cafes & restaurants	—	3 101	12 389	—	—	0.1
Transport & storage	44 937	77 762	118 094	0.6	0.9	1.2
Communication services	214 555	251 193	353 991	2.8	2.9	3.5
Finance & insurance	716 808	885 237	901 947	9.2	10.2	8.9
Property & business services						
Scientific research	444 030	463 813	537 994	5.7	5.4	5.3
Technical services	225 405	285 207	312 500	2.9	3.3	3.1
Computer services	678 256	589 937	620 099	8.7	6.8	6.2
Property & business services n.e.c.	160 022	226 996	246 417	2.1	2.6	2.4
Total	1 507 713	1 565 952	1 717 011	19.4	18.1	17.0
Education	3 749	1 987	2 297	—	—	—
Health & community services	19 914	33 145	42 667	0.3	0.4	0.4
Cultural & recreational services	21 145	10 605	28 963	0.3	0.1	0.3
Personal & other services	14 586	37 639	46 684	0.2	0.4	0.5
Total	7 769 954	8 648 249	10 080 703	100.0	100.0	100.0

— nil or rounded to zero (including null cells)
na not available

(a) 2003-04 and 2004-05 data have been revised. See the Revisions section of the Technical Note for further detail.

EXPENDITURE ON R&D, by industry—by type of expenditure

CURRENT EXPENDITURE

	Capital expenditure	Labour costs	Other current expenditure	Total	Total expenditure on R&D
	\$'000	\$'000	\$'000	\$'000	\$'000
Agriculture, forestry & fishing	10 091	28 812	56 676	85 488	95 579
Mining	100 242	269 381	1 313 776	1 583 157	1 683 399
Manufacturing					
Food, beverage & tobacco	20 604	152 558	158 189	310 747	331 350
Textile, clothing, footwear & leather	3 695	18 801	16 041	34 842	38 537
Wood & paper product	5 697	32 253	83 441	115 694	121 391
Printing, publishing & recorded media	4 458	66 359	22 101	88 461	92 919
Petroleum, coal, chemical & assoc. product	84 501	205 229	417 466	622 696	707 197
Non-metallic mineral product	13 379	32 055	58 446	90 501	103 880
Metal product	56 912	148 392	423 474	571 866	628 778
Machinery & equipment					
Motor vehicle & part	39 012	332 399	282 793	615 192	654 204
Other transport equipment	7 657	173 444	87 431	260 875	268 532
Photographic & scientific equip.	9 801	112 419	100 665	213 084	222 885
Electronic equipment	23 151	221 712	165 735	387 447	410 598
Electrical equipment & appliance	2 458	40 469	33 188	73 657	76 115
Industrial machinery & equipment	14 009	80 203	76 504	156 707	170 717
Total	96 089	960 645	746 316	1 706 962	1 803 051
Other manufacturing	4 419	22 204	35 016	57 220	61 639
Total	289 754	1 638 497	1 960 491	3 598 988	3 888 742
Electricity, gas & water supply	15 643	14 576	28 450	43 027	58 670
Construction	7 722	66 776	278 790	345 566	353 288
Wholesale trade	39 432	354 016	309 118	663 134	702 566
Retail trade	5 076	42 043	27 297	69 340	74 416
Accommodation, cafes & restaurants	np	4 735	np	np	12 389
Transport & storage	15 723	37 594	64 777	102 371	118 094
Communication services	6 818	115 481	231 692	347 173	353 991
Finance & insurance	32 493	322 714	546 740	869 454	901 947
Property & business services					
Scientific research	35 053	209 724	293 218	502 941	537 994
Technical services	15 757	161 867	134 876	296 743	312 500
Computer services	25 204	444 679	150 217	594 895	620 099
Property & business services n.e.c.	20 138	131 936	94 343	226 279	246 417
Total	96 152	948 205	672 654	1 620 859	1 717 011
Education	np	np	np	np	2 297
Health & community services	3 101	19 678	19 887	39 566	42 667
Cultural & recreational services	6 259	11 220	11 484	22 704	28 963
Personal & other services	np	np	24 305	np	46 684
Total	640 972	3 886 767	5 552 964	9 439 731	10 080 703

np not available for publication but included in totals where applicable, unless otherwise indicated

EXPENDITURE ON R&D, by industry—by type of expenditure: **proportions**

CURRENT EXPENDITURE

	<i>Capital expenditure</i>	<i>Labour costs</i>	<i>Other current expenditure</i>	<i>Total</i>	<i>Total expenditure on R&D</i>
	%	%	%	%	%
Agriculture, forestry & fishing	10.6	30.1	59.3	89.4	100.0
Mining	6.0	16.0	78.0	94.0	100.0
Manufacturing					
Food, beverage & tobacco	6.2	46.0	47.7	93.8	100.0
Textile, clothing, footwear & leather	9.6	48.8	41.6	90.4	100.0
Wood & paper product	4.7	26.6	68.7	95.3	100.0
Printing, publishing & recorded media	4.8	71.4	23.8	95.2	100.0
Petroleum, coal, chemical & assoc. product	11.9	29.0	59.0	88.1	100.0
Non-metallic mineral product	12.9	30.9	56.3	87.1	100.0
Metal product	9.1	23.6	67.3	90.9	100.0
Machinery & equipment					
Motor vehicle & part	6.0	50.8	43.2	94.0	100.0
Other transport equipment	2.9	64.6	32.6	97.1	100.0
Photographic & scientific equip.	4.4	50.4	45.2	95.6	100.0
Electronic equipment	5.6	54.0	40.4	94.4	100.0
Electrical equipment & appliance	3.2	53.2	43.6	96.8	100.0
Industrial machinery & equipment	8.2	47.0	44.8	91.8	100.0
<i>Total</i>	5.3	53.3	41.4	94.7	100.0
Other manufacturing	7.2	36.0	56.8	92.8	100.0
<i>Total</i>	7.5	42.1	50.4	92.5	100.0
Electricity, gas & water supply	26.7	24.8	48.5	73.3	100.0
Construction	2.2	18.9	78.9	97.8	100.0
Wholesale trade	5.6	50.4	44.0	94.4	100.0
Retail trade	6.8	56.5	36.7	93.2	100.0
Accommodation, cafes & restaurants	np	38.2	np	np	100.0
Transport & storage	13.3	31.8	54.9	86.7	100.0
Communication services	1.9	32.6	65.5	98.1	100.0
Finance & insurance	3.6	35.8	60.6	96.4	100.0
Property & business services					
Scientific research	6.5	39.0	54.5	93.5	100.0
Technical services	5.0	51.8	43.2	95.0	100.0
Computer services	4.1	71.7	24.2	95.9	100.0
Property & business services n.e.c.	8.2	53.5	38.3	91.8	100.0
<i>Total</i>	5.6	55.2	39.2	94.4	100.0
Education	np	np	np	np	100.0
Health & community services	7.3	46.1	46.6	92.7	100.0
Cultural & recreational services	21.6	38.7	39.6	78.4	100.0
Personal & other services	np	np	52.1	np	100.0
Total	6.4	38.6	55.1	93.6	100.0

np not available for publication but included in totals where applicable, unless otherwise indicated

EXPENDITURE ON R&D, by industry—by source of funds

	Own funds	Other businesses	Commonwealth government	State and local government	Other Australian (a)	Overseas	Total expenditure on R&D
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Agriculture, forestry & fishing	84 638	1 735	4 233	2 726	np	np	95 579
Mining	1 628 382	np	3 441	272	np	np	1 683 399
Manufacturing							
Food, beverage & tobacco	319 717	np	5 220	np	np	np	331 350
Textile, clothing, footwear & leather	26 991	np	10 520	np	—	—	38 537
Wood & paper product	119 653	np	np	np	np	—	121 391
Printing, publishing & recorded media	89 067	np	np	np	np	np	92 919
Petroleum, coal, chemical & assoc. product	667 842	12 030	19 397	np	np	4 666	707 197
Non-metallic mineral product	100 595	np	2 353	np	—	—	103 880
Metal product	621 609	np	6 336	np	—	np	628 778
Machinery & equipment							
Motor vehicle & part	589 680	np	59 177	np	np	—	654 204
Other transport equipment	144 099	np	np	—	—	np	268 532
Photographic & scientific equip.	198 499	9 371	12 010	np	1 267	np	222 885
Electronic equipment	391 920	4 732	11 185	—	np	np	410 598
Electrical equipment & appliance	72 329	2 277	np	np	—	—	76 115
Industrial machinery & equipment	153 849	3 598	6 617	878	np	np	170 717
Total	1 550 376	23 124	169 337	np	7 088	np	1 803 051
Other manufacturing	57 325	np	1 729	np	—	np	61 639
Total	3 553 175	43 676	216 894	4 009	9 550	61 438	3 888 742
Electricity, gas & water supply	52 210	1 429	2 691	1 680	np	np	58 670
Construction	345 346	6 116	1 235	np	np	np	353 288
Wholesale trade	668 550	3 211	14 529	np	np	15 837	702 566
Retail trade	66 786	3 910	3 468	np	np	—	74 416
Accommodation, cafes & restaurants	12 389	—	—	—	—	—	12 389
Transport & storage	116 808	np	986	—	np	np	118 094
Communication services	351 883	np	1 285	np	—	—	353 991
Finance & insurance	892 144	6 694	2 309	np	np	—	901 947
Property & business services							
Scientific research	333 258	47 112	80 122	7 830	36 571	33 102	537 994
Technical services	245 093	25 584	16 334	10 360	2 373	12 757	312 500
Computer services	554 229	20 648	31 768	np	1 807	np	620 099
Property & business services n.e.c.	181 425	13 165	11 130	np	3 444	np	246 417
Total	1 314 005	106 508	139 354	20 120	44 195	92 829	1 717 011
Education	np	—	np	—	—	—	2 297
Health & community services	33 366	903	3 573	np	np	np	42 667
Cultural & recreational services	np	1 455	np	—	—	—	28 963
Personal & other services	43 987	665	747	175	np	np	46 684
Total	9 191 819	223 273	396 401	32 236	59 403	177 571	10 080 703

— nil or rounded to zero (including null cells)

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(a) Includes funding from Joint government/business, Higher education and Private non-profit organisations.

EXPENDITURE ON R&D, by industry—by source of funds: proportions

	Own funds	Other businesses	Commonwealth government	State and local government	Other Australian(a)	Overseas	Total expenditure on R&D
	%	%	%	%	%	%	%
Agriculture, forestry & fishing	88.6	1.8	4.4	2.9	np	np	100.0
Mining	96.7	np	0.2	—	np	np	100.0
Manufacturing							
Food, beverage & tobacco	96.5	np	1.6	np	np	np	100.0
Textile, clothing, footwear & leather	70.0	np	27.3	np	—	—	100.0
Wood & paper product	98.6	np	np	np	np	—	100.0
Printing, publishing & recorded media	95.9	np	np	np	np	np	100.0
Petroleum, coal, chemical & assoc. product	94.4	1.7	2.7	np	np	0.7	100.0
Non-metallic mineral product	96.8	np	2.3	np	—	—	100.0
Metal product	98.9	np	1.0	np	—	np	100.0
Machinery & equipment							
Motor vehicle & part	90.1	np	9.0	np	np	—	100.0
Other transport equipment	53.7	np	np	—	—	np	100.0
Photographic & scientific equip.	89.1	4.2	5.4	np	0.6	np	100.0
Electronic equipment	95.5	1.2	2.7	—	np	np	100.0
Electrical equipment & appliance	95.0	3.0	np	np	—	—	100.0
Industrial machinery & equipment	90.1	2.1	3.9	0.5	np	np	100.0
Total	86.0	1.3	9.4	np	0.4	np	100.0
Other manufacturing	93.0	np	2.8	np	—	np	100.0
Total	91.4	1.1	5.6	0.1	0.2	1.6	100.0
Electricity, gas & water supply	89.0	2.4	4.6	2.9	np	np	100.0
Construction	97.8	1.7	0.3	np	np	np	100.0
Wholesale trade	95.2	0.5	2.1	np	np	2.3	100.0
Retail trade	89.7	5.3	4.7	np	np	—	100.0
Accommodation, cafes & restaurants	100.0	—	—	—	—	—	100.0
Transport & storage	98.9	np	0.8	—	np	np	100.0
Communication services	99.4	np	0.4	np	—	—	100.0
Finance & insurance	98.9	0.7	0.3	np	np	—	100.0
Property & business services							
Scientific research	61.9	8.8	14.9	1.5	6.8	6.2	100.0
Technical services	78.4	8.2	5.2	3.3	0.8	4.1	100.0
Computer services	89.4	3.3	5.1	np	0.3	np	100.0
Property & business services n.e.c.	73.6	5.3	4.5	np	1.4	np	100.0
Total	76.5	6.2	8.1	1.2	2.6	5.4	100.0
Education	np	—	np	—	—	—	100.0
Health & community services	78.2	2.1	8.4	np	np	np	100.0
Cultural & recreational services	np	5.0	np	—	—	—	100.0
Personal & other services	94.2	1.4	1.6	0.4	np	np	100.0
Total	91.2	2.2	3.9	0.3	0.6	1.8	100.0

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(a) Includes funding from Joint government/business, Higher education and Private non-profit organisations.

EXPENDITURE ON R&D, by industry—by type of activity

	<i>Pure basic research</i>	<i>Strategic basic research</i>	<i>Applied research</i>	<i>Experimental development</i>	<i>Total expenditure on R&D</i>
	\$'000	\$'000	\$'000	\$'000	\$'000
Agriculture, forestry & fishing	1 638	11 232	46 185	36 524	95 579
Mining	8 365	78 363	689 796	906 875	1 683 399
Manufacturing					
Food, beverage & tobacco	1 725	20 779	98 251	210 595	331 350
Textile, clothing, footwear & leather	1 127	3 959	12 348	21 103	38 537
Wood & paper product	np	np	11 573	107 387	121 391
Printing, publishing & recorded media	429	3 025	17 313	72 152	92 919
Petroleum, coal, chemical & assoc. product	5 018	55 591	155 189	491 399	707 197
Non-metallic mineral product	565	8 756	30 791	63 768	103 880
Metal product	1 472	13 214	190 174	423 918	628 778
Machinery & equipment					
Motor vehicle & part	1 175	12 126	58 982	581 921	654 204
Other transport equipment	195	2 869	44 914	220 553	268 532
Photographic & scientific equip.	4 532	12 339	78 018	127 996	222 885
Electronic equipment	823	6 351	211 940	191 485	410 598
Electrical equipment & appliance	397	2 757	16 143	56 819	76 115
Industrial machinery & equipment	1 649	7 608	67 738	93 721	170 717
Total	8 771	44 050	477 735	1 272 494	1 803 051
Other manufacturing	np	np	29 836	28 748	61 639
Total	20 272	153 696	1 023 211	2 691 563	3 888 742
Electricity, gas & water supply	206	7 933	32 913	17 618	58 670
Construction	1 051	4 686	127 016	220 536	353 288
Wholesale trade	4 255	17 331	201 493	479 487	702 566
Retail trade	1 257	8 453	25 019	39 687	74 416
Accommodation, cafes & restaurants	np	—	1 331	np	12 389
Transport & storage	370	4 435	53 096	60 193	118 094
Communication services	np	np	132 448	207 002	353 991
Finance & insurance	3 351	11 536	182 138	704 922	901 947
Property & business services					
Scientific research	6 638	37 069	267 572	226 716	537 994
Technical services	3 190	14 478	182 886	111 946	312 500
Computer services	8 533	31 986	219 539	360 041	620 099
Property & business services n.e.c.	4 656	12 857	101 706	127 199	246 417
Total	23 017	96 390	771 702	825 901	1 717 011
Education	—	np	1 122	np	2 297
Health & community services	1 810	3 226	15 589	22 042	42 667
Cultural & recreational services	np	np	7 015	20 814	28 963
Personal & other services	np	np	2 039	43 944	46 684
Total	67 093	412 658	3 312 113	6 288 838	10 080 703

— nil or rounded to zero (including null cells)

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EXPENDITURE ON R&D, by industry—by type of activity: proportions

	<i>Pure basic research</i>	<i>Strategic basic research</i>	<i>Applied research</i>	<i>Experimental development</i>	<i>Total expenditure on R&D</i>
	%	%	%	%	%
Agriculture, forestry & fishing	1.7	11.8	48.3	38.2	100.0
Mining	0.5	4.7	41.0	53.9	100.0
Manufacturing					
Food, beverage & tobacco	0.5	6.3	29.7	63.6	100.0
Textile, clothing, footwear & leather	2.9	10.3	32.0	54.8	100.0
Wood & paper product	np	np	9.5	88.5	100.0
Printing, publishing & recorded media	0.5	3.3	18.6	77.7	100.0
Petroleum, coal, chemical & assoc. product	0.7	7.9	21.9	69.5	100.0
Non-metallic mineral product	0.5	8.4	29.6	61.4	100.0
Metal product	0.2	2.1	30.2	67.4	100.0
Machinery & equipment					
Motor vehicle & part	0.2	1.9	9.0	89.0	100.0
Other transport equipment	0.1	1.1	16.7	82.1	100.0
Photographic & scientific equip.	2.0	5.5	35.0	57.4	100.0
Electronic equipment	0.2	1.5	51.6	46.6	100.0
Electrical equipment & appliance	0.5	3.6	21.2	74.6	100.0
Industrial machinery & equipment	1.0	4.5	39.7	54.9	100.0
<i>Total</i>	0.5	2.4	26.5	70.6	100.0
Other manufacturing	np	np	48.4	46.6	100.0
<i>Total</i>	0.5	4.0	26.3	69.2	100.0
Electricity, gas & water supply	0.4	13.5	56.1	30.0	100.0
Construction	0.3	1.3	36.0	62.4	100.0
Wholesale trade	0.6	2.5	28.7	68.2	100.0
Retail trade	1.7	11.4	33.6	53.3	100.0
Accommodation, cafes & restaurants	np	—	10.7	np	100.0
Transport & storage	0.3	3.8	45.0	51.0	100.0
Communication services	np	np	37.4	58.5	100.0
Finance & insurance	0.4	1.3	20.2	78.2	100.0
Property & business services					
Scientific research	1.2	6.9	49.7	42.1	100.0
Technical services	1.0	4.6	58.5	35.8	100.0
Computer services	1.4	5.2	35.4	58.1	100.0
Property & business services n.e.c.	1.9	5.2	41.3	51.6	100.0
<i>Total</i>	1.3	5.6	44.9	48.1	100.0
Education	—	np	48.8	np	100.0
Health & community services	4.2	7.6	36.5	51.7	100.0
Cultural & recreational services	np	np	24.2	71.9	100.0
Personal & other services	np	np	4.4	94.1	100.0
Total	0.7	4.1	32.9	62.4	100.0

— nil or rounded to zero (including null cells)

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EXPENDITURE ON R&D, by industry—by location

	NSW	Vic.	Qld	SA	WA	Other states and territories (a)	Overseas	Total expenditure on R&D
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Agriculture, forestry & fishing	30 625	11 668	15 751	5 401	18 038	np	np	95 579
Mining	392 198	145 371	348 226	76 516	703 713	16 044	1 331	1 683 399
Manufacturing								
Food, beverage & tobacco	119 105	123 522	38 712	20 854	17 822	11 144	191	331 350
Textile, clothing, footwear & leather	8 354	24 624	np	np	1 549	np	1 244	38 537
Wood & paper product	12 955	50 289	np	np	np	3 577	np	121 391
Printing, publishing & recorded media	41 987	35 269	9 351	2 314	np	np	np	92 919
Petroleum, coal, chemical & assoc. product	147 204	367 088	57 541	36 247	67 043	10 949	21 125	707 197
Non-metallic mineral product	38 648	34 599	17 040	219	6 077	7 296	—	103 880
Metal product	162 745	79 005	107 531	67 809	153 371	np	np	628 778
Machinery & equipment								
Motor vehicle & part	18 077	539 810	21 178	57 857	2 064	np	np	654 204
Other transport equipment	83 034	63 284	85 260	np	31 324	1 050	np	268 532
Photographic & scientific equip.	120 274	42 720	21 703	6 625	12 173	397	18 993	222 885
Electronic equipment	124 919	66 534	17 087	np	23 193	15 564	np	410 598
Electrical equipment & appliance	35 376	13 298	6 646	15 665	4 712	np	np	76 115
Industrial machinery & equipment	63 261	32 025	36 461	9 001	23 418	5 901	650	170 717
Total	444 941	757 671	188 335	224 330	96 884	23 232	67 658	1 803 051
Other manufacturing	28 149	14 492	11 146	761	4 864	np	np	61 639
Total	1 004 087	1 486 559	444 043	355 005	387 853	115 522	95 674	3 888 742
Electricity, gas & water supply	14 847	6 454	18 154	np	9 157	2 706	np	58 670
Construction	84 046	69 794	55 569	6 136	129 054	np	np	353 288
Wholesale trade	275 318	293 292	48 738	43 062	35 513	4 558	2 086	702 566
Retail trade	25 399	22 222	11 265	9 735	4 167	1 215	413	74 416
Accommodation, cafes & restaurants	1 067	np	np	np	np	np	—	12 389
Transport & storage	43 711	47 296	14 573	5 922	np	np	np	118 094
Communication services	187 817	np	6 479	1 807	4 368	2 269	np	353 991
Finance & insurance	625 551	203 992	20 442	7 285	38 990	np	np	901 947
Property & business services								
Scientific research	140 656	184 888	99 555	45 936	26 646	20 601	19 712	537 994
Technical services	83 991	82 615	45 833	41 937	51 879	4 847	1 399	312 500
Computer services	250 859	141 581	93 667	27 142	51 559	52 016	3 275	620 099
Property & business services n.e.c.	121 020	58 273	33 835	12 952	13 766	3 561	3 011	246 417
Total	596 525	467 357	272 890	127 968	143 850	81 025	27 397	1 717 011
Education	613	np	np	—	—	np	—	2 297
Health & community services	20 655	13 632	2 759	848	3 065	np	np	42 667
Cultural & recreational services	6 336	14 409	4 884	3 172	np	np	np	28 963
Personal & other services	22 540	17 203	4 691	np	1 716	np	np	46 684
Total	3 331 334	2 954 439	1 272 651	653 102	1 485 071	250 172	133 933	10 080 703

— nil or rounded to zero (including null cells)

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(a) Includes Tasmania, Northern Territory, Australian Capital Territory and Australian External Territories.

	NSW	Vic.	Qld	SA	WA	Other states and territories (a)	Overseas	Total expenditure on R&D
	%	%	%	%	%	%	%	%
Agriculture, forestry & fishing	32.0	12.2	16.5	5.7	18.9	np	np	100.0
Mining	23.3	8.6	20.7	4.5	41.8	1.0	0.1	100.0
Manufacturing								
Food, beverage & tobacco	35.9	37.3	11.7	6.3	5.4	3.4	0.1	100.0
Textile, clothing, footwear & leather	21.7	63.9	np	np	4.0	np	3.2	100.0
Wood & paper product	10.7	41.4	np	np	np	2.9	np	100.0
Printing, publishing & recorded media	45.2	38.0	10.1	2.5	np	np	np	100.0
Petroleum, coal, chemical & assoc. product	20.8	51.9	8.1	5.1	9.5	1.5	3.0	100.0
Non-metallic mineral product	37.2	33.3	16.4	0.2	5.9	7.0	—	100.0
Metal product	25.9	12.6	17.1	10.8	24.4	np	np	100.0
Machinery & equipment								
Motor vehicle & part	2.8	82.5	3.2	8.8	0.3	np	np	100.0
Other transport equipment	30.9	23.6	31.8	np	11.7	0.4	np	100.0
Photographic & scientific equip.	54.0	19.2	9.7	3.0	5.5	0.2	8.5	100.0
Electronic equipment	30.4	16.2	4.2	np	5.6	3.8	np	100.0
Electrical equipment & appliance	46.5	17.5	8.7	20.6	6.2	np	np	100.0
Industrial machinery & equipment	37.1	18.8	21.4	5.3	13.7	3.5	0.4	100.0
Total	24.7	42.0	10.4	12.4	5.4	1.3	3.8	100.0
Other manufacturing	45.7	23.5	18.1	1.2	7.9	np	np	100.0
Total	25.8	38.2	11.4	9.1	10.0	3.0	2.5	100.0
Electricity, gas & water supply	25.3	11.0	30.9	np	15.6	4.6	np	100.0
Construction	23.8	19.8	15.7	1.7	36.5	np	np	100.0
Wholesale trade	39.2	41.7	6.9	6.1	5.1	0.6	0.3	100.0
Retail trade	34.1	29.9	15.1	13.1	5.6	1.6	0.6	100.0
Accommodation, cafes & restaurants	8.6	np	np	np	np	np	—	100.0
Transport & storage	37.0	40.0	12.3	5.0	np	np	np	100.0
Communication services	53.1	np	1.8	0.5	1.2	0.6	np	100.0
Finance & insurance	69.4	22.6	2.3	0.8	4.3	np	np	100.0
Property & business services								
Scientific research	26.1	34.4	18.5	8.5	5.0	3.8	3.7	100.0
Technical services	26.9	26.4	14.7	13.4	16.6	1.6	0.4	100.0
Computer services	40.5	22.8	15.1	4.4	8.3	8.4	0.5	100.0
Property & business services n.e.c.	49.1	23.6	13.7	5.3	5.6	1.4	1.2	100.0
Total	34.7	27.2	15.9	7.5	8.4	4.7	1.6	100.0
Education	26.7	np	np	—	—	np	—	100.0
Health & community services	48.4	31.9	6.5	2.0	7.2	np	np	100.0
Cultural & recreational services	21.9	49.7	16.9	11.0	np	np	np	100.0
Personal & other services	48.3	36.8	10.0	np	3.7	np	np	100.0
Total	33.0	29.3	12.6	6.5	14.7	2.5	1.3	100.0

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(a) Includes Tasmania, Northern Territory, Australian Capital Territory and Australian External Territories.

EXPENDITURE ON R&D, by industry—by employment size

	0-4 persons	5-19 persons	20-199 persons	200 or more persons	Total expenditure on R&D
	\$'000	\$'000	\$'000	\$'000	\$'000
Agriculture, forestry & fishing	11 772	12 748	30 545	40 514	95 579
Mining	44 074	78 576	225 750	1 334 999	1 683 399
Manufacturing					
Food, beverage & tobacco	2 929	8 096	44 045	276 280	331 350
Textile, clothing, footwear & leather	863	2 324	19 722	15 628	38 537
Wood & paper product	np	3 006	np	76 816	121 391
Printing, publishing & recorded media	3 280	10 951	22 980	55 708	92 919
Petroleum, coal, chemical & assoc. product	26 583	28 098	136 432	516 084	707 197
Non-metallic mineral product	np	3 065	np	83 501	103 880
Metal product	8 684	9 780	130 386	479 928	628 778
Machinery & equipment					
Motor vehicle & part	7 323	8 337	25 385	613 159	654 204
Other transport equipment	2 255	1 515	16 837	247 925	268 532
Photographic & scientific equip.	4 449	27 436	92 473	98 527	222 885
Electronic equipment	7 271	59 302	64 876	279 149	410 598
Electrical equipment & appliance	3 596	10 449	25 234	36 836	76 115
Industrial machinery & equipment	8 732	28 265	87 518	46 202	170 717
Total	33 626	135 304	312 323	1 321 798	1 803 051
Other manufacturing	1 612	7 965	45 989	6 073	61 639
Total	79 861	208 589	768 476	2 831 816	3 888 742
Electricity, gas & water supply	3 498	np	np	52 009	58 670
Construction	6 670	13 699	25 178	307 741	353 288
Wholesale trade	19 521	52 828	129 491	500 726	702 566
Retail trade	5 855	24 582	39 706	4 273	74 416
Accommodation, cafes & restaurants	—	np	np	np	12 389
Transport & storage	8 568	6 263	14 609	88 654	118 094
Communication services	2 836	16 193	11 834	323 128	353 991
Finance & insurance	12 495	19 065	46 764	823 623	901 947
Property & business services					
Scientific research	np	195 060	271 026	np	537 994
Technical services	19 232	89 914	98 929	104 425	312 500
Computer services	42 633	163 474	264 871	149 121	620 099
Property & business services n.e.c.	np	58 789	61 327	np	246 417
Total	149 355	507 238	696 153	364 265	1 717 011
Education	np	np	np	—	2 297
Health & community services	3 795	9 836	18 531	10 505	42 667
Cultural & recreational services	np	3 893	10 832	np	28 963
Personal & other services	2 987	4 331	3 936	35 430	46 684
Total	354 031	961 988	2 026 485	6 738 199	10 080 703

— nil or rounded to zero (including null cells)

np not available for publication but included in totals
where applicable, unless otherwise indicated

EXPENDITURE ON R&D, by industry—by employment size: proportions

	0–4 persons	5–19 persons	20–199 persons	200 or more persons	Total expenditure on R&D
	%	%	%	%	%
Agriculture, forestry & fishing	12.3	13.3	32.0	42.4	100.0
Mining	2.6	4.7	13.4	79.3	100.0
Manufacturing					
Food, beverage & tobacco	0.9	2.4	13.3	83.4	100.0
Textile, clothing, footwear & leather	2.2	6.0	51.2	40.6	100.0
Wood & paper product	np	2.5	np	63.3	100.0
Printing, publishing & recorded media	3.5	11.8	24.7	60.0	100.0
Petroleum, coal, chemical & assoc. product	3.8	4.0	19.3	73.0	100.0
Non-metallic mineral product	np	3.0	np	80.4	100.0
Metal product	1.4	1.6	20.7	76.3	100.0
Machinery & equipment					
Motor vehicle & part	1.1	1.3	3.9	93.7	100.0
Other transport equipment	0.8	0.6	6.3	92.3	100.0
Photographic & scientific equip.	2.0	12.3	41.5	44.2	100.0
Electronic equipment	1.8	14.4	15.8	68.0	100.0
Electrical equipment & appliance	4.7	13.7	33.2	48.4	100.0
Industrial machinery & equipment	5.1	16.6	51.3	27.1	100.0
Total	1.9	7.5	17.3	73.3	100.0
Other manufacturing	2.6	12.9	74.6	9.9	100.0
Total	2.1	5.4	19.8	72.8	100.0
Electricity, gas & water supply	6.0	np	np	88.6	100.0
Construction	1.9	3.9	7.1	87.1	100.0
Wholesale trade	2.8	7.5	18.4	71.3	100.0
Retail trade	7.9	33.0	53.4	5.7	100.0
Accommodation, cafes & restaurants	—	np	np	np	100.0
Transport & storage	7.3	5.3	12.4	75.1	100.0
Communication services	0.8	4.6	3.3	91.3	100.0
Finance & insurance	1.4	2.1	5.2	91.3	100.0
Property & business services					
Scientific research	np	36.3	50.4	np	100.0
Technical services	6.2	28.8	31.7	33.4	100.0
Computer services	6.9	26.4	42.7	24.0	100.0
Property & business services n.e.c.	np	23.9	24.9	np	100.0
Total	8.7	29.5	40.5	21.2	100.0
Education	np	np	np	—	100.0
Health & community services	8.9	23.1	43.4	24.6	100.0
Cultural & recreational services	np	13.4	37.4	np	100.0
Personal & other services	6.4	9.3	8.4	75.9	100.0
Total	3.5	9.5	20.1	66.8	100.0

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

EXPENDITURE ON R&D(a), by socio-economic objective—values and proportions

	EXPENDITURE ON R&D			PROPORTION OF TOTAL EXPENDITURE ON R&D		
	2003-04	2004-05	2005-06(b)	2003-04	2004-05	2005-06(b)
	\$'000	\$'000	\$'000	%	%	%
DEFENCE	242 839	278 020	330 009	3.1	3.2	3.3
ECONOMIC DEVELOPMENT						
Plant production & plant primary products	99 899	108 091	155 691	1.3	1.2	1.5
Animal production & animal primary products	52 700	52 689	90 627	0.7	0.6	0.9
Mineral resources (excl. energy)						
Primary mining & extraction processes	388 995	455 633	554 435	5.0	5.3	5.5
First stage treatment of ores & minerals	213 246	261 510	328 776	2.7	3.0	3.3
Other mineral resources (excl. energy)	93 438	90 010	148 160	1.2	1.0	1.5
Total	695 679	807 153	1 031 371	9.0	9.3	10.2
Energy Resources	500 817	682 304	1 006 952	6.4	7.9	10.0
Energy Supply	170 194	239 373	245 473	2.2	2.8	2.4
Manufacturing						
Processed food products & beverages	301 443	339 399	321 076	3.9	3.9	3.2
Wood, wood products & paper	113 412	110 389	113 477	1.5	1.3	1.1
Human pharmaceutical products	369 194	456 410	495 597	4.8	5.3	4.9
Industrial chemicals & related products	219 958	189 909	221 309	2.8	2.2	2.2
Basic metal products (incl. smelting)	120 082	119 538	244 638	1.5	1.4	2.4
Fabricated metal products	154 466	161 837	202 564	2.0	1.9	2.0
Transport equipment	798 713	867 716	896 599	10.3	10.0	8.9
Computer hardware & electronic equipment	149 865	164 545	164 665	1.9	1.9	1.6
Communication equipment	113 454	126 620	112 466	1.5	1.5	1.1
Instrumentation	68 387	77 316	66 606	0.9	0.9	0.7
Machinery & equipment	254 239	261 578	265 154	3.3	3.0	2.6
Other manufactured products	216 193	175 926	245 143	2.8	2.0	2.4
Manufacturing n.e.c.	196 654	241 224	235 948	2.5	2.8	2.3
Total	3 076 059	3 292 406	3 585 243	39.6	38.1	35.6
Construction	326 463	365 267	441 884	4.2	4.2	4.4
Transport	119 856	151 039	168 121	1.5	1.7	1.7
Information & communication services						
Computer software & services	679 719	777 851	860 481	8.7	9.0	8.5
Communication services	433 706	427 197	521 255	5.6	4.9	5.2
Other information & communication services	39 951	26 729	37 018	0.5	0.3	0.4
Total	1 153 376	1 231 777	1 418 755	14.8	14.2	14.1
Commercial services & tourism						
Finance, property & business services	748 402	844 094	831 781	9.6	9.8	8.3
Other commercial services	93 369	69 840	72 360	1.2	0.8	0.7
Commercial services & tourism n.e.c.	74 304	92 770	141 596	1.0	1.1	1.4
Total	916 075	1 006 704	1 045 737	11.8	11.6	10.4
Economic framework	15 026	20 284	26 400	0.2	0.2	0.3
Total	7 126 144	7 957 086	9 216 254	91.7	92.0	91.4
SOCIETY						
Health	277 958	282 472	351 895	3.6	3.3	3.5
Education & training	17 312	14 495	16 559	0.2	0.2	0.2
Social development & community services	34 243	39 946	55 814	0.4	0.5	0.6
Total	329 513	336 913	424 268	4.2	3.9	4.2
ENVIRONMENT						
Environmental policy frameworks & other aspects	18 618	8 582	6 763	0.2	0.1	0.1
Environmental management	50 119	62 457	96 450	0.6	0.7	1.0
Total	68 737	71 039	103 213	0.9	0.8	1.0
NON-ORIENTED RESEARCH	2 720	5 191	6 960	—	0.1	0.1
Total	7 769 954	8 648 249	10 080 703	100.0	100.0	100.0

— nil or rounded to zero (including null cells)

(a) 2003-04 and 2004-05 data have been revised. See the Revisions section of the Technical Note for further detail.

(b) Businesses classified to Agriculture, forestry and fishing are in scope of the survey from 2005-06 and may impact the comparability of previous data.

EXPENDITURE ON R&D(a), by research field—values and proportions

	EXPENDITURE ON R&D			PROPORTION OF TOTAL EXPENDITURE ON R&D		
	2003-04	2004-05	2005-06(b)	2003-04	2004-05	2005-06(b)
	\$'000	\$'000	\$'000	%	%	%
Mathematical sciences	22 599	14 002	18 345	0.3	0.2	0.2
Physical sciences	45 834	40 657	25 484	0.6	0.5	0.3
Chemical sciences	206 209	207 938	244 175	2.7	2.4	2.4
Earth sciences	150 308	126 403	170 742	1.9	1.5	1.7
Biological sciences	217 449	183 794	174 508	2.8	2.1	1.7
Information, computing & communication sciences						
Information systems	712 426	867 436	884 682	9.2	10.0	8.8
Computer software	897 901	954 872	1 145 938	11.6	11.0	11.4
Other information, computing & comm. sciences	242 748	200 597	199 273	3.1	2.3	2.0
Information, computing & comm. sciences n.e.c.	239 371	254 345	254 936	3.1	2.9	2.5
Total	2 092 446	2 277 251	2 484 829	26.9	26.3	24.6
Engineering & technology						
Industrial biotechnology & food sciences	208 208	269 178	251 572	2.7	3.1	2.5
Manufacturing engineering	519 597	536 514	570 932	6.7	6.2	5.7
Automotive engineering	715 991	733 933	761 478	9.2	8.5	7.6
Mechanical & industrial engineering	223 640	253 420	316 393	2.9	2.9	3.1
Resources engineering	753 368	1 033 476	1 500 256	9.7	12.0	14.9
Civil engineering	157 945	312 889	394 376	2.0	3.6	3.9
Electrical & electronic engineering	251 752	232 145	247 090	3.2	2.7	2.5
Metallurgy	299 625	351 922	374 142	3.9	4.1	3.7
Materials engineering	218 813	261 683	308 405	2.8	3.0	3.1
Communications technologies	388 984	395 060	478 970	5.0	4.6	4.8
Other engineering & technology	124 559	103 568	103 007	1.6	1.2	1.0
Engineering & technology n.e.c.	450 996	475 213	549 953	5.8	5.5	5.5
Total	4 313 478	4 959 000	5 856 574	55.5	57.3	58.1
Agricultural, veterinary & environmental sciences	222 948	236 130	384 026	2.9	2.7	3.8
Architecture, urban environment & building	33 073	21 746	22 272	0.4	0.3	0.2
Medical & health sciences						
Pharmacology & pharmaceutical sciences	159 570	143 080	207 026	2.1	1.7	2.1
Clinical sciences	146 520	156 161	193 446	1.9	1.8	1.9
Medical & health sciences n.e.c.	128 354	238 363	242 366	1.7	2.8	2.4
Total	434 444	537 603	642 839	5.6	6.2	6.4
Education	6 280	6 822	8 173	0.1	0.1	0.1
Economics	5 550	5 915	9 189	0.1	0.1	0.1
Commerce, management, tourism & services	15 422	23 415	23 294	0.2	0.3	0.2
Policy & political science	—	np	537	—	np	—
Studies in human society	221	823	363	—	—	—
Behavioural & cognitive sciences	899	862	1 240	—	—	—
Law, justice & law enforcement	453	np	1 091	—	np	—
Journalism, librarianship & curatorial studies	np	np	np	np	np	np
The arts	2 212	5 190	12 561	—	0.1	0.1
Language & culture	np	41	351	np	—	—
History & archaeology	np	np	np	np	np	np
Philosophy & religion	—	np	—	—	np	—
Total	7 769 954	8 648 249	10 080 703	100.0	100.0	100.0

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) 2003-04 and 2004-05 data have been revised. See the Revisions section of the Technical Note for further detail.

(b) Businesses classified to Agriculture, forestry and fishing are in scope of the survey from 2005-06 and may impact the comparability of previous data.

	HUMAN RESOURCES DEVOTED TO R&D			PROPORTION OF TOTAL HUMAN RESOURCES DEVOTED TO R&D		
	2003-04	2004-05	2005-06(b)	2003-04	2004-05	2005-06(b)
	PYE	PYE	PYE	%	%	%
Type of resource						
Researchers	21 635	22 543	23 099	57.8	55.8	53.9
Technicians	10 347	12 014	13 492	27.6	29.7	31.5
Other supporting staff	5 448	5 860	6 246	14.6	14.5	14.6
Employment size						
0-4 persons	1 419	1 591	1 392	3.8	3.9	3.2
5-19 persons	5 499	5 842	5 925	14.7	14.5	13.8
20-199 persons	11 345	11 548	11 607	30.3	28.6	27.1
200 or more persons	19 167	21 435	23 914	51.2	53.0	55.8
Industry						
Agriculture, forestry & fishing	na	na	464	na	na	1.1
Mining	1 029	1 658	2 440	2.7	4.1	5.7
Manufacturing						
Food, beverage & tobacco	1 607	1 763	1 755	4.3	4.4	4.1
Textile, clothing, footwear & leather	247	255	242	0.7	0.6	0.6
Wood & paper product	436	450	455	1.2	1.1	1.1
Printing, publishing & recorded media	280	483	725	0.7	1.2	1.7
Petroleum, coal, chemical & assoc. product	2 622	2 799	2 287	7.0	6.9	5.3
Non-metallic mineral product	356	304	382	1.0	0.8	0.9
Metal product	1 211	1 587	1 714	3.2	3.9	4.0
Machinery & equipment						
Motor vehicle & part	3 483	3 355	3 307	9.3	8.3	7.7
Other transport equipment	1 179	1 279	1 835	3.2	3.2	4.3
Photographic & scientific equip.	2 196	2 163	1 322	5.9	5.4	3.1
Electronic equipment	2 448	2 027	2 443	6.5	5.0	5.7
Electrical equipment & appliance	871	815	614	2.3	2.0	1.4
Industrial machinery & equipment	1 506	1 240	1 155	4.0	3.1	2.7
Total	11 683	10 877	10 676	31.2	26.9	24.9
Other manufacturing	197	278	332	0.5	0.7	0.8
Total	18 638	18 796	18 568	49.8	46.5	43.3
Electricity, gas & water supply	181	209	180	0.5	0.5	0.4
Construction	735	869	790	2.0	2.1	1.8
Wholesale trade	2 949	3 392	3 770	7.9	8.4	8.8
Retail trade	282	604	589	0.8	1.5	1.4
Accommodation, cafes & restaurants	—	29	57	—	0.1	0.1
Transport & storage	196	290	456	0.5	0.7	1.1
Communication services	738	714	1 023	2.0	1.8	2.4
Finance & insurance	1 777	2 452	2 491	4.7	6.1	5.8
Property & business services						
Scientific research	2 170	2 145	2 308	5.8	5.3	5.4
Technical services	1 451	1 708	2 007	3.9	4.2	4.7
Computer services	5 847	5 375	5 386	15.6	13.3	12.6
Property & business services n.e.c.	1 074	1 695	1 671	2.9	4.2	3.9
Total	10 542	10 923	11 373	28.2	27.0	26.5
Education	46	43	26	0.1	0.1	0.1
Health & community services	152	270	296	0.4	0.7	0.7
Cultural & recreational services	122	98	163	0.3	0.2	0.4
Personal & other services	43	72	151	0.1	0.2	0.4
Total	37 430	40 417	42 837	100.0	100.0	100.0

— nil or rounded to zero (including null cells)

na not available

(a) 2003-04 and 2004-05 data have been revised. See the Revisions section of the Technical Note for further detail.

(b) Businesses classified to Agriculture, forestry and fishing are in scope of the survey from 2005-06 and may impact the comparability of previous data.

HUMAN RESOURCES DEVOTED TO R&D, by industry—by type of resource

	Researchers	Technicians	Other supporting staff	Total human resources devoted to R&D
	PYE	PYE	PYE	PYE
Agriculture, forestry & fishing	213	154	96	464
Mining	1 108	867	465	2 440
Manufacturing				
Food, beverage & tobacco	719	700	337	1 755
Textile, clothing, footwear & leather	86	88	67	242
Wood & paper product	135	80	240	455
Printing, publishing & recorded media	455	205	65	725
Petroleum, coal, chemical & assoc. product	1 278	658	351	2 287
Non-metallic mineral product	173	146	64	382
Metal product	773	590	351	1 714
Machinery & equipment				
Motor vehicle & part	1 965	985	357	3 307
Other transport equipment	723	770	342	1 835
Photographic & scientific equip.	860	320	142	1 322
Electronic equipment	1 657	525	261	2 443
Electrical equipment & appliance	298	243	72	614
Industrial machinery & equipment	412	455	288	1 155
Total	5 915	3 298	1 463	10 676
Other manufacturing	133	101	98	332
Total	9 667	5 866	3 036	18 568
Electricity, gas & water supply	127	36	17	180
Construction	248	351	192	790
Wholesale trade	2 072	1 108	591	3 770
Retail trade	300	195	94	589
Accommodation, cafes & restaurants	40	12	5	57
Transport & storage	249	138	69	456
Communication services	603	335	84	1 023
Finance & insurance	1 429	708	355	2 491
Property & business services				
Scientific research	1 253	774	282	2 308
Technical services	1 187	565	255	2 007
Computer services	3 362	1 606	419	5 386
Property & business services n.e.c.	961	492	218	1 671
Total	6 762	3 437	1 173	11 373
Education	11	11	4	26
Health & community services	136	131	30	296
Cultural & recreational services	66	84	13	163
Personal & other services	67	62	22	151
Total	23 099	13 492	6 246	42 837

	Researchers	Technicians	Other supporting staff	Total human resources devoted to R&D
	%	%	%	%
Agriculture, forestry & fishing	46.0	33.3	20.7	100.0
Mining	45.4	35.5	19.1	100.0
Manufacturing				
Food, beverage & tobacco	41.0	39.9	19.2	100.0
Textile, clothing, footwear & leather	35.6	36.6	27.8	100.0
Wood & paper product	29.7	17.5	52.8	100.0
Printing, publishing & recorded media	62.7	28.3	9.0	100.0
Petroleum, coal, chemical & assoc. product	55.9	28.8	15.4	100.0
Non-metallic mineral product	45.2	38.1	16.7	100.0
Metal product	45.1	34.4	20.5	100.0
Machinery & equipment				
Motor vehicle & part	59.4	29.8	10.8	100.0
Other transport equipment	39.4	42.0	18.7	100.0
Photographic & scientific equip.	65.0	24.2	10.8	100.0
Electronic equipment	67.8	21.5	10.7	100.0
Electrical equipment & appliance	48.6	39.7	11.7	100.0
Industrial machinery & equipment	35.7	39.4	25.0	100.0
Total	55.4	30.9	13.7	100.0
Other manufacturing	40.1	30.4	29.5	100.0
Total	52.1	31.6	16.3	100.0
Electricity, gas & water supply	70.4	20.0	9.6	100.0
Construction	31.3	44.4	24.3	100.0
Wholesale trade	55.0	29.4	15.7	100.0
Retail trade	51.0	33.1	15.9	100.0
Accommodation, cafes & restaurants	70.8	20.3	8.8	100.0
Transport & storage	54.6	30.2	15.2	100.0
Communication services	59.0	32.8	8.2	100.0
Finance & insurance	57.4	28.4	14.2	100.0
Property & business services				
Scientific research	54.3	33.5	12.2	100.0
Technical services	59.1	28.2	12.7	100.0
Computer services	62.4	29.8	7.8	100.0
Property & business services n.e.c.	57.5	29.4	13.1	100.0
Total	59.5	30.2	10.3	100.0
Education	43.3	41.0	15.7	100.0
Health & community services	45.8	44.1	10.1	100.0
Cultural & recreational services	40.4	51.5	8.0	100.0
Personal & other services	44.4	40.9	14.7	100.0
Total	53.9	31.5	14.6	100.0

HUMAN RESOURCES DEVOTED TO R&D, by industry—by employment size

	0–4 persons	5–19 persons	20–199 persons	200 or more persons	Total human resources devoted to R&D
	PYE	PYE	PYE	PYE	PYE
Agriculture, forestry & fishing	22	82	104	255	464
Mining	21	82	298	2 040	2 440
Manufacturing					
Food, beverage & tobacco	np	np	232	1 487	1 755
Textile, clothing, footwear & leather	2	19	131	89	242
Wood & paper product	np	np	159	280	455
Printing, publishing & recorded media	15	108	233	370	725
Petroleum, coal, chemical & assoc. product	46	176	702	1 363	2 287
Non-metallic mineral product	11	30	92	250	382
Metal product	25	65	482	1 143	1 714
Machinery & equipment					
Motor vehicle & part	np	np	206	2 984	3 307
Other transport equipment	np	np	128	1 677	1 835
Photographic & scientific equip.	31	158	613	519	1 322
Electronic equipment	44	226	557	1 616	2 443
Electrical equipment & appliance	23	100	179	312	614
Industrial machinery & equipment	36	189	636	293	1 155
Total	188	768	2 319	7 402	10 676
Other manufacturing	8	66	222	36	332
Total	307	1 272	4 571	12 419	18 568
Electricity, gas & water supply	13	np	np	156	180
Construction	19	104	89	578	790
Wholesale trade	77	391	952	2 351	3 770
Retail trade	44	288	247	10	589
Accommodation, cafes & restaurants	—	np	np	np	57
Transport & storage	13	48	36	359	456
Communication services	25	105	94	800	1 023
Finance & insurance	23	157	145	2 166	2 491
Property & business services					
Scientific research	np	678	1 383	np	2 308
Technical services	108	454	678	767	2 007
Computer services	370	1 623	2 265	1 128	5 386
Property & business services n.e.c.	np	494	486	np	1 671
Total	787	3 250	4 812	2 524	11 373
Education	np	np	np	—	26
Health & community services	15	61	132	89	296
Cultural & recreational services	np	28	66	np	163
Personal & other services	4	33	28	86	151
Total	1 392	5 925	11 607	23 914	42 837

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

	0–4 persons	5–19 persons	20–199 persons	200 or more persons	Total human resources devoted to R&D
	%	%	%	%	%
Agriculture, forestry & fishing	4.8	17.7	22.4	55.1	100.0
Mining	0.9	3.4	12.2	83.6	100.0
Manufacturing					
Food, beverage & tobacco	np	np	13.2	84.7	100.0
Textile, clothing, footwear & leather	0.9	7.8	54.4	36.9	100.0
Wood & paper product	np	np	34.9	61.6	100.0
Printing, publishing & recorded media	2.1	14.9	32.1	51.0	100.0
Petroleum, coal, chemical & assoc. product	2.0	7.7	30.7	59.6	100.0
Non-metallic mineral product	2.8	7.8	24.0	65.5	100.0
Metal product	1.4	3.8	28.1	66.7	100.0
Machinery & equipment					
Motor vehicle & part	np	np	6.2	90.2	100.0
Other transport equipment	np	np	7.0	91.3	100.0
Photographic & scientific equip.	2.4	12.0	46.4	39.3	100.0
Electronic equipment	1.8	9.2	22.8	66.2	100.0
Electrical equipment & appliance	3.8	16.2	29.1	50.9	100.0
Industrial machinery & equipment	3.1	16.4	55.1	25.4	100.0
Total	1.8	7.2	21.7	69.3	100.0
Other manufacturing	2.4	19.9	66.9	10.8	100.0
Total	1.7	6.8	24.6	66.9	100.0
Electricity, gas & water supply	7.2	np	np	86.7	100.0
Construction	2.4	13.2	11.2	73.2	100.0
Wholesale trade	2.0	10.4	25.3	62.3	100.0
Retail trade	7.5	48.9	41.9	1.7	100.0
Accommodation, cafes & restaurants	—	np	np	np	100.0
Transport & storage	2.9	10.5	7.9	78.7	100.0
Communication services	2.4	10.2	9.1	78.2	100.0
Finance & insurance	0.9	6.3	5.8	87.0	100.0
Property & business services					
Scientific research	np	29.4	59.9	np	100.0
Technical services	5.4	22.6	33.8	38.2	100.0
Computer services	6.9	30.1	42.1	20.9	100.0
Property & business services n.e.c.	np	29.6	29.1	np	100.0
Total	6.9	28.6	42.3	22.2	100.0
Education	np	np	np	—	100.0
Health & community services	4.9	20.5	44.7	29.9	100.0
Cultural & recreational services	np	17.3	40.4	np	100.0
Personal & other services	2.3	21.8	18.8	57.1	100.0
Total	3.2	13.8	27.1	55.8	100.0

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

EXPLANATORY NOTES

DATA SOURCES

1 The statistics presented in this publication have been compiled from data collected from businesses in the Survey of Research and Experimental Development in respect of the year ended 30 June 2006. The survey was conducted by mail questionnaire and a 90.3% response rate was obtained.

2 The GDP and GSP figures used to derive BERD/GDP and BERD/GSP ratios are current at the time of manuscript finalisation and are referenced in the tables below.

EXPENDITURE ON GROSS DOMESTIC PRODUCT, current prices

	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
GDP	577 373	607 759	645 058	689 262	735 714	781 675	840 285	896 568	966 442

Source: *National Income, Expenditure and Product, Australian National Accounts, March Quarter 2007* (cat. no. 5206.0)

GROSS STATE PRODUCT, current prices

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
2003-04	291 540	211 944	145 418	57 155	92 445	14 835	9 445	17 500
2004-05	305 859	222 221	160 986	59 457	102 837	16 054	10 678	18 473
2005-06	319 541	233 320	182 211	62 798	119 190	17 193	12 240	19 477

Source: *Australian National Accounts, State Accounts* (cat. no. 5220.0)

STATISTICAL UNITS DEFINED ON THE ABS BUSINESS REGISTER

3 The ABS uses an economic statistics units model on the ABS Business Register to describe the characteristics of businesses (and other organisations, including government departments), and the structural relationships between related businesses. The units model is also used to break groups of related businesses into relatively homogeneous components that can provide data to the ABS.

4 In mid 2002, to better use the information available as a result of The New Tax System, the ABS changed its economic statistics units model. The new units model allocates businesses to one of two sub-populations. The vast majority of businesses are in what is called the ATO Maintained Population, while the remaining businesses are in the ABS Maintained Population. Together, these two sub-populations make up the ABS Business Register population.

ATO maintained population

5 Most businesses and organisations in Australia need to obtain an Australian Business Number (ABN), and are then included on the ATO Australian Business Register. Most of these businesses have simple structures, in which case the unit registered for an ABN will satisfy ABS statistical requirements. For these businesses, the ABS has aligned its statistical units structure with the ABN unit. The businesses with simple structures constitute the ATO Maintained Population, and the ABN unit is used for these businesses as the statistical unit for all economic collections.

ABS maintained population

6 For the population of businesses where the ABN unit is not suitable for ABS statistical requirements, the ABS maintains its own units structure through direct contact with the business. These businesses constitute the ABS Maintained Population. This population consists typically of large, complex and diverse businesses. The new statistical units model described below has been introduced to cover such businesses.

7 Enterprise Group: This is a unit covering all the operations in Australia of one or more legal entities under common ownership and/or control. It covers all the operations in Australia of legal entities which are related in terms of the current Corporations Law(as

EXPLANATORY NOTES *continued*

ABS maintained population
continued

amended by the Corporations Legislation Amendment Act 1991), including legal entities such as companies, trusts, and partnerships. Majority ownership is not required for control to be exercised.

8 Enterprise: The enterprise is an institutional unit comprising (i) a single legal entity or business entity, or (ii) more than one legal entity or business entity within the same Enterprise Group and in the same institutional sub-sector (i.e. they are all classified to a single Standard Institutional Sector Classification of Australia sub-sector).

9 Type of Activity Unit (TAU): The TAU comprises one or more business entities, sub-entities or branches of a business entity within an Enterprise Group that can report production and employment data for similar economic activities. When a minimum set of data items is available, a TAU is created which covers all the operations within an industry sub-division (and the TAU is classified to the relevant sub-division of ANZSIC). Where a business cannot supply adequate data for each industry, a TAU is formed which contains activity in more than one industry sub-division.

10 For more information on the impacts of the introduction of the new economic statistics units model, refer to *Information Paper: Improvements in ABS Economic Statistics [Arising from The New Tax System]* (cat. no. 1372.0).

Unit splitting

11 In cases where a TAU is deemed to have significant activities applying to more than one industry subdivision, the TAU is split for statistical purposes. Where a TAU has been split, the provider is asked to report data for all activities covered by the TAU (i.e. the TAU remains the collection unit). The data is then apportioned across the separate TAU splits (the statistical units) by ABS staff using factors determined during business profiling. TAU splits were implemented in the R&D survey for the first time, beginning with 2005–06 cycle, and were applied for previous cycles according to revision rules outlined in the Technical Note.

DEFINITIONS

12 R&D as collected by the ABS is defined in accordance with the 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'. Although outside the economic boundary of R&D as defined by the OECD, R&D performed overseas by Australian businesses is included in the data in this publication.

13 Expenditures in this publication represent R&D performed by the business itself (intramural). R&D funded by a business but performed wholly by another on their behalf (extramural) is out of scope of the survey. However, payments for analytical work, engineering or specialised services which form part of an R&D project performed by the business, are in scope of the survey.

14 For a more comprehensive discussion of R&D activity, see the *Australian Standard Research Classification (ASRC), 1998* (cat. no. 1297.0) or refer to the OECD publication *Proposed Standard Practice for Surveys of Research and Experimental Development ('Frascati Manual') 2002*, OECD, Paris, 2003.

SCOPE AND COVERAGE

15 Due to strong growth in the number of businesses performing R&D in recent years, changes have been made to the scope of the R&D survey this cycle to enable continued release of detailed R&D statistics within available resources. Previously, the survey scope included all businesses within the Australian business sector (i.e. all businesses and the private non-profit institutions mainly serving them) but excluding businesses mainly engaged in Agriculture, forestry and fishing. Commencing with the 2005–06 survey cycle, the scope was adjusted to exclude businesses with expenditure on R&D of less than \$100,000 in the reference period. Offsetting this change, however, was the inclusion of businesses classified to Division A (Agriculture, forestry and fishing) of the *Australian and New Zealand Standard Industrial Classification (ANZSIC), 1993* (cat. no. 1292.0).

EXPLANATORY NOTES *continued*

SCOPE AND COVERAGE

continued

The scope changes were not backcast for previous reference periods, given their offsetting nature and their relatively minor impact on key survey estimates.

16 It is estimated that the exclusion of businesses with R&D expenditure of less than \$100,000 resulted in the understatement of estimated total business expenditure on R&D for 2005–06 by approximately 0.5%. Users should, however, use caution when comparing current and past cycle estimates for businesses with 0–4 employees, as the majority of units with expenditure below \$100,000 fell into this employment size range. Most affected were estimates of PYE.

17 Within the scope of the survey, businesses were included if they:

- reported R&D activity in previous surveys;
- applied for an AusIndustry administered R&D Tax Concession and/or grant for industry R&D;
- indicated that R&D activity had been performed, with expenditure of \$100,000 or more, in the reference year via a coverage questionnaire; or
- were identified as likely to have R&D activity from other sources such as newspapers, industrial journals, research compendia etc..

INDUSTRY CLASSIFICATION

18 The statistics in this publication are classified to industry in accordance with the *Australian and New Zealand Standard Industrial Classification (ANZSIC), 1993* (cat. no. 1292.0). Aggregated groupings of industries annotated with n.e.c. reflect the remnant of the relevant ANZSIC Division.

19 Each ABN unit/TAU is classified by the ABS to the industry in which it mainly operates. In cases where an Enterprise Group sets up a dedicated research unit, that unit is classified to the predominant industry of the group rather than to Scientific Research (ANZSIC 7810), in accordance with standards set out in the Frascati Manual.

EMPLOYMENT SIZE

20 Employment size relates to the number of persons employed by the business during the last pay period ending in June 2006.

AUSTRALIAN STANDARD RESEARCH CLASSIFICATION (ASRC)

21 Statistics classified by Research fields, courses and disciplines classifications (RFCD), Socio-economic objective (SEO) and Type of activity (TOA) have been collected and presented in this publication. Data were subjectively allocated by businesses at the time of reporting. See the Technical Note on Reliability of Statistics for further detail. For more information on these classifications, see the *Australian Standard Research Classification (ASRC), 1998* (cat. no. 1297.0). Aggregated groupings of SEOs or RFCDs are annotated with n.e.c. and reflect the remnant of the relevant SEO Subdivision or RFCD Division.

CHAIN VOLUME MEASURES (CVM)

22 CVM in this publication are annually reweighted chain Laspeyres indexes referenced to the current price values in a chosen reference year (currently 2004–05). They are formed in a multistage process of which the major steps are described in Section 15 of the *Information Paper: Introduction of Chain Volume Measures in the Australian National Accounts* (cat. no. 5248.0).

RELATED PUBLICATIONS

23 Users may also wish to refer to the following publications:

Australian Bureau of Statistics 1998, *Australian Standard Research Classification (ASRC)*, cat. no. 1297.0, ABS, Canberra

Australian Bureau of Statistics 2006, *Innovation in Australian Business 2005*, cat. no. 8158.0, ABS, Canberra

Australian Bureau of Statistics 2006, *Research and Experimental Development, All Sector Summary, Australia, 2004–05*, cat. no. 8112.0, ABS, Canberra

Australian Bureau of Statistics 2006, *Research and Experimental Development, Government and Private Non-Profit Organisations, Australia, 2004–05*, cat. no. 8109.0, ABS, Canberra

EXPLANATORY NOTES *continued*

RELATED PUBLICATIONS *continued*

Australian Bureau of Statistics 2006, *Research and Experimental Development, Higher Education Organisations, Australia, 2004*, cat. no. 8111.0, ABS, Canberra
Organisation for Economic Co-operation and Development 2003, *Proposed Standard Practice for Surveys of Research and Experimental Development (Frascati Manual) 2002*, OECD, Paris

24 Current publications and other products released by the ABS are listed in the *Catalogue of Publications and Products* (cat. no. 1101.0). The catalogue is available from any ABS office or the ABS web site <<http://www.abs.gov.au>>. The ABS also issues a daily release advice on the web site which details products to be released in the week ahead.

ABS DATA AVAILABLE ON REQUEST

25 As well as the statistics included in this and related publications, the ABS may have other relevant data available on request. Inquiries should be made to the National Information and Referral Service on 1300 135 070.

ROUNDING

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

TECHNICAL NOTE DATA QUALITY

NON-SAMPLING ERROR

1 Non-sampling errors may arise as a result of errors in the reporting, recording or processing of data. These errors can be introduced through inadequacies in the questionnaire, treatment of non-response, inaccurate reporting by providers, errors in the application of survey procedures, incorrect recording of answers and errors in data capture and processing.

2 The extent to which non-sampling error affects the results is difficult to measure. Every effort is made to minimise non-sampling error by careful design and testing of the questionnaire, the use of efficient operating procedures and systems, and the use of appropriate methodologies.

Reliability of Statistics

3 When interpreting the statistics in this publication, the reliability of the estimates may be affected by the following specific non-sampling errors:

- Many businesses provided estimates due to a lack of separately recorded data on R&D activity.
- The OECD standard definition of R&D used in this survey may differ from what businesses regard as R&D activity. This is mainly due to slight differences, from the international standard, in the R&D definition used within the grants for industry R&D schemes (for the allocation of grants) and the AusIndustry administered R&D Tax Concession scheme (for tax deductibility for specific R&D activities). It is possible that some businesses have not reported R&D data as per the OECD definition.
- Data were subjectively classified, by businesses, to research fields and socio-economic objectives at the time of reporting. Some businesses may have experienced difficulty in classifying their R&D programs. The ABS makes every effort to ensure correct and consistent interpretation and reporting of these data by applying consistent processing methodologies.

Treatment of non-response

4 Non-responding businesses which reported R&D activity in the previous cycle, had data imputed based on the 2005–06 expected R&D expenditure provided in 2004–05.

5 Data are not imputed for non-responding businesses which have not previously reported R&D activity. These units are not expected to have significant levels of R&D activity.

REVISIONS

6 Revisions to previous cycle data occur on discovery of: errors in previously reported data; and newly identified R&D performers in the previous cycle(s). Where newly identified R&D performers indicate that significant levels of R&D have been undertaken in earlier years, details are collected and used to revise previously released estimates.

7 Revisions are only applied, up to two cycles prior to the current cycle, where:

- R&D expenditure is equal to \$5 million or more; or
- the impact on estimated Human resources devoted to R&D is equal to 25 PYE or more.

8 Due to some misreporting of contractors as employees in previously reported data, estimates of PYE for 2003–04 and 2004–05 have been revised downwards in this publication. Most affected were PYE estimates for the Finance and insurance industry.

GLOSSARY

Applied research	Original work undertaken primarily to acquire new knowledge with a specific application in view. It 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.
Capital expenditure	Expenditure on the acquisition of fixed tangible assets such as land, buildings, vehicles, plant, machinery and equipment attributable to R&D activity.
Current expenditure	Expenditure on direct labour costs, materials, fuels, rent and hiring, repairs and maintenance, data processing etc. and the proportion of expenditure on general services and overheads which are attributable to R&D activity.
Employees	Persons who worked for a private or public employer and received pay for the reference period in the form of wages or salaries, a commission while also receiving a retainer, tips, piece rates or payment in kind. Persons who operated their own incorporated business with or without hiring employees are also included as employees.
Experimental development	Systematic work, using existing knowledge gained from research or practical experience for the purpose of creating new or improved products/processes.
Human resources devoted to R&D	The effort of researchers, technicians and other staff directly involved with R&D activity. Overhead staff (e.g. administrative and general service employees such as personnel officers, janitors, etc.) whose work indirectly supports R&D, are excluded.
Labour costs	Expenditure relating to: wages and salaries; overtime earnings; penalty payments; shift allowances; employer contributions into superannuation; fringe benefits and payroll taxes; severance, termination and redundancy payments; workers' compensation premiums/costs; provisions for employee entitlements; salaries and fees of directors and executives; retainers and commissions of persons who received a retainer; bonuses; annual and other types of paid leave.
Location	The region(s) in which the business performed the R&D. This may not be the head office location of the business.
Other current expenditure	Expenditure on: materials, fuels and other inputs; rent, leasing and hiring expenses; repair and maintenance expenses; payments to outside organisations for use of specialised testing facilities or for analytical work, engineering or other specialised services in support of R&D projects carried out by the business; commission and consultant expenses for research projects carried out by the business (except direct labour costs); software for own account produced as part of R&D; and the proportion of expenditure on general services and overheads which is attributable to R&D activity.
Other supporting staff	Skilled and unskilled craftpersons, secretarial and clerical staff directly associated with R&D activity.
Person years of effort	One person year of effort is equal to a full time employee whose time is wholly devoted to R&D for a whole year.
Pure basic research	Experimental and theoretical work undertaken to acquire new knowledge without looking for long term benefits other than the advancement of knowledge.
R&D activity	Systematic investigation or experimentation involving innovation or technical risk. The outcome of which is new knowledge, with or without a specific practical application, or new or improved products, processes, materials, devices or services. R&D activity extends to modifications to existing products/processes. R&D activity ceases and pre-production begins when work is no longer experimental.
Research field	Field in which the R&D activity was performed. The R&D classification is primarily structured around disciplines or activities. In short, it describes the nature of the research being performed.

GLOSSARY *continued*

Researchers	Those involved with the conception and/or development of new products/processes (e.g. executives and directors involved in the planning or management of scientific and technical aspects of R&D projects; and software developers/programmers). They exclude executives and directors concerned primarily with budgets and human resources rather than project content.
Socio-economic objective	The broad socio-economic areas of expected benefit rather than the immediate objectives of the researcher. The SEO classification defines the main areas of Australian economic and social activity to which the results of research programs are applied. In short, it describes the purpose of the research.
Strategic basic research	Experimental and theoretical work undertaken to acquire new knowledge directed in specified broad areas in the expectation of useful discoveries. It provides the broad base of knowledge for the solution of recognised practical problems.
Technicians	Those performing technical tasks in support of R&D activity, normally under the direction and supervision of a researcher. These tasks include preparation of experiments, taking records, preparation of charts and graphs, etc.

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