



RESEARCH AND EXPERIMENTAL DEVELOPMENT, BUSINESSES AUSTRALIA

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I N Q U I R I E S

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.

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NOTES

CHANGES IN THIS ISSUE

Changes have been made to the format and content of this publication.
Cross-classifications of data included in previous issues may be available on request.

Business counts do not appear in this publication but may be available on request, subject to caveats. See paragraph 4 of the Explanatory Notes for further detail.

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 significant revisions to data this cycle. See the Revisions section of the Technical Note for further detail.

Susan Linacre
Acting Australian Statistician

ABBREVIATIONS

\$'000	thousand dollars
\$m	million dollars
ABN	Australian Business Number
ABR	Australian Business Register
ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AET	Australian External Territories
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
no.	number
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
TAU	type of activity unit
Vic.	Victoria
WA	Western Australia

MAIN FEATURES

EXPENDITURE ON RESEARCH AND EXPERIMENTAL DEVELOPMENT (R&D)

Business expenditure on R&D (BERD) in Australia during 2004–05 was \$8,446.2 million. This represented an increase of 10.4% in current price terms over 2003–04 and 7.1% in chain volume terms and was the sixth successive year of increase.

RESOURCES DEVOTED TO R&D

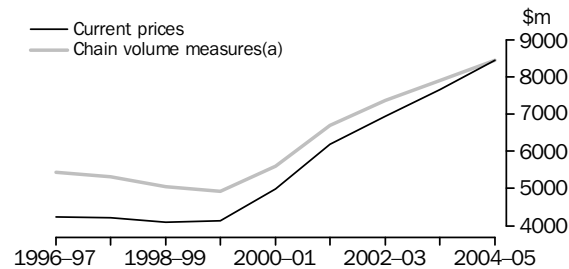
		1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05
Expenditure on R&D										
Current prices	\$m	4 234.7	4 221.1	4 094.7	4 136.7	4 982.6	6 191.9	r6 940.3	r7 648.1	8 446.2
Chain volume measures(a)	\$m	5 432.6	5 311.2	5 041.3	4 923.3	5 604.5	6 705.8	7 363.8	7 885.2	8 446.2
Human resources devoted to R&D	PYE	26 412	24 769	25 109	26 507	28 391	32 209	r35 939	r39 027	41 656

r revised

(a) The reference year for chain volume measures is 2004–05. See paragraph 17 of the Explanatory Notes.

Over the five years to 2004–05, BERD increased at an average annual rate of 20.8% in current price terms and 14.3% in chain volume terms.

BUSINESS EXPENDITURE ON R&D

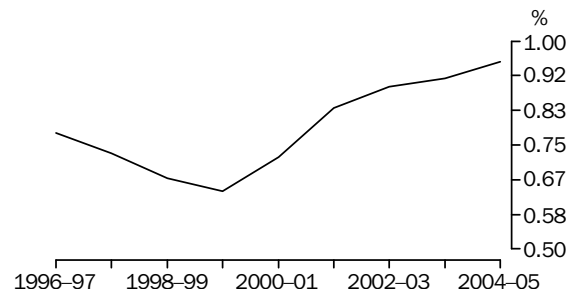


(a) The reference year for chain volume measures is 2004–05. See paragraph 17 of the Explanatory Notes.

Proportion of GDP

BERD increased as a proportion of GDP between 2003–04 and 2004–05, moving from 0.91% to 0.95%. This continued a period of growth dating back to 1999–2000, when the ratio fell to 0.64%.

BERD AS A PROPORTION OF GDP(a)



(a) See paragraph 2 of the Explanatory Notes.

Although Australia recorded one of the largest increases in BERD/GDP ratio of all OECD countries between 2003–04 and 2004–05, it remained below the OECD average of 1.53%. The following table shows BERD/GDP ratios for selected OECD countries.

MAIN FEATURES *continued*

*Proportion of GDP
continued*

BERD/GDP RATIOS OF OECD COUNTRIES

	2000-01	2001-02	2002-03	2003-04	2004-05
	%	%	%	%	%
Sweden	na	3.28	na	2.93	na
Finland	2.40	2.41	2.40	2.45	2.46
Japan	2.12	2.26	2.33	2.36	2.35
Korea	1.77	1.97	1.90	2.00	2.19
United States of America	2.05	2.00	1.86	1.87	1.88
Germany	1.73	1.72	1.72	1.76	1.75
Denmark	na	1.64	1.73	1.77	1.69
Iceland	1.54	1.79	1.76	1.51	na
France	1.34	1.39	1.41	1.37	1.36
Belgium	1.43	1.51	1.37	1.31	1.30
United Kingdom	1.21	1.24	1.25	1.24	1.16
Canada	1.17	1.31	1.18	1.12	1.07
Netherlands	1.06	1.05	0.98	1.01	1.03
Australia	0.72	0.84	0.89	0.91	0.95
Norway	na	0.96	0.96	0.99	0.88
Czech Republic	0.74	0.74	0.75	0.77	0.81
Ireland	0.81	0.77	0.76	0.77	0.77
Spain	0.49	0.48	0.54	0.57	0.58
Italy	0.52	0.53	0.54	0.52	0.54
New Zealand	na	0.42	na	0.49	na
Hungary	0.35	0.38	0.36	0.35	0.37
Slovak Republic	0.43	0.43	0.37	0.32	0.26
Portugal	0.22	0.27	0.26	0.26	na
Turkey	0.21	0.24	0.19	na	na
Greece	0.16	0.21	0.20	0.19	na
Poland	0.24	0.23	0.12	0.15	0.17
Mexico	0.11	0.12	0.15	0.15	na
Total OECD	1.55	1.57	1.52	1.53	1.53

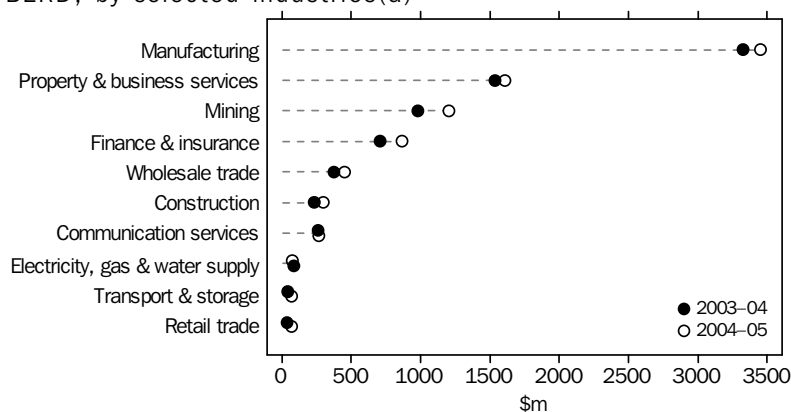
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Source: *Main Science and Technology Indicators, 2006/1*, OECD, Paris, 2006

Industry

In 2004–05, the largest contributors to BERD were Manufacturing (\$3,451.4 million or 40.9% of BERD), Property and business services (\$1,609.6 million or 19.1%) and Mining (\$1,204.5 million or 14.3%). Of all industries, Mining showed the largest growth from 2003–04, increasing its expenditure on R&D by \$226.5 million (23.2%). Other industries recording large increases were Finance and insurance (up \$156.6 million or 22.1%) and Manufacturing (up \$125.1 million or 3.8%).

BERD, by selected industries(a)



(a) Top ten industries ranked by 2004–05 expenditure.

MAIN FEATURES *continued*

Type of expenditure

As in previous years, BERD in 2004–05 was mainly comprised of Current expenditure (\$7,922.6 million or 93.8% of BERD). Current expenditure was in turn comprised of \$3,661.8 million in Labour costs and \$4,260.9 million in Other current expenditure. Capital expenditure in 2004–05 totalled \$523.6 million.

Mining reported the lowest level of Labour costs as a proportion of BERD (14.2%), but the highest proportion of Other current expenditure (79.6%). Retail trade, Finance and insurance and Cultural and recreational services reported the highest Labour costs as a proportion of BERD (all above 58.0%).

At \$237.4 million, Manufacturing accounted for 45.3% of all Capital expenditure on R&D in 2004–05. The next highest level of Capital expenditure was reported by Property and business services at \$96.1 million.

Source of funds

The Business sector was the main source of R&D funds in 2004–05, with \$7,490.6 million (88.7%) coming from Own funds and \$227.5 million (2.7%) from Other businesses. Commonwealth government and Overseas organisations were the next largest funders of R&D, at \$330.9 million (3.9%) and \$315.8 million (3.7%) respectively.

Transport and storage, Construction and Finance and insurance were almost wholly self-funded (all above 99.0%), while Property and business services had the lowest proportion of self-funded research (74.5%).

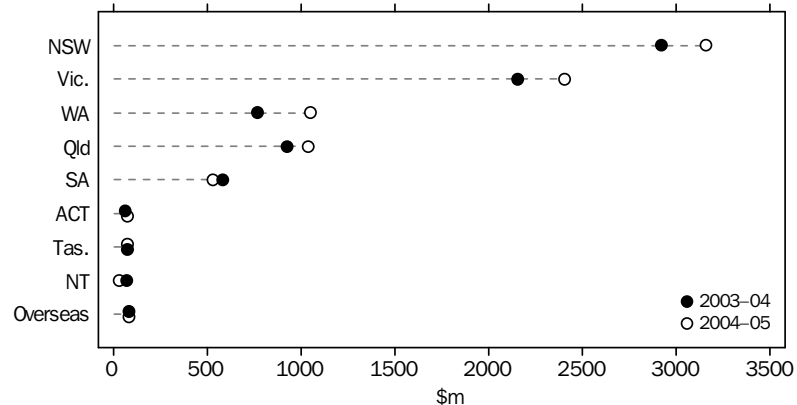
Type of activity

In 2004–05, the majority of R&D activity was directed into Experimental development (64.5% or \$5,446.8 million) and Applied research (30.9% or \$2,607.5 million). Applied research showed the largest growth between 2002–03 and 2004–05, increasing by \$879.9 million or 50.9%.

Location

Locations in New South Wales and Victoria continued to record the highest levels of BERD in 2004–05, at \$3,157.0 million (37.4%) and \$2,405.0 million (28.5%) respectively. However, since 2003–04, Western Australia has recorded the highest level of growth, increasing by 36.7% to \$1,051.2 million. For the first time since 1998–99, Western Australia's BERD surpassed that of Queensland.

BERD, by location(a)



(a) Ranked by 2004–05 expenditure.

MAIN FEATURES *continued*

Location continued

Manufacturing expenditure on R&D was highest in Victoria (\$1,396.1 million), Property and business services in New South Wales (\$559.4 million) and Mining in Western Australia (\$452.0 million) and Queensland (\$354.0 million).

The highest state percentages of BERD as a proportion of Gross State Product (GSP) were in Victoria (1.08%), Western Australia (1.04%) and New South Wales (1.03%).

BERD AS A PROPORTION OF GSP(a), by location

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT
	%	%	%	%	%	%	%	%
2002-03	0.99	1.04	0.62	1.01	0.69	0.45	np	0.27
2003-04	1.00	1.01	0.64	1.03	0.83	0.51	0.76	0.38
2004-05	1.03	1.08	0.65	0.89	1.04	0.46	0.30	0.42

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

(a) See paragraph 2 of the Explanatory Notes.

Employment size

In 2004-05, businesses with 200 or more employees contributed \$5,536.2 million or 65.5% of BERD. This employment size group also accounted for most of the growth in BERD (\$736.7 million or 92.3%) between 2003-04 and 2004-05. At the industry level, 93.3% of Finance and insurance expenditure was attributable to this employment size group, compared to 3.8% in Retail trade.

Making the smallest contribution to BERD in 2004-05 were businesses with 0-4 employees (\$314.2 million or 3.7%). This employment size group's share of BERD was down 4.3% or \$34.4 million from 2003-04. Expenditure on R&D for businesses with 0-4 employees was dominated by Property and business services (\$129.3 million) and Mining (\$80.4 million).

Socio-economic objectives (SEO)

In 2004-05, as in previous years, the majority of BERD (92.2% or \$7,783.5 million) was directed into Economic development. The largest components of expenditure within Economic development were Manufacturing (\$3,259.9 million) and Information and communication services (\$1,201.0 million). The distribution of BERD across SEOs was largely unchanged from previous years.

Research fields

Accounting for the majority of BERD in 2004-05 were the Research fields of Engineering and technology (\$4,820.3 million or 57.1% of BERD) and Information, computing and communication sciences (\$2,209.1 million or 26.2%). The distribution of BERD across Research fields remained relatively stable between 2003-04 and 2004-05.

HUMAN RESOURCES DEVOTED TO R&D

Human resources devoted to R&D in 2004-05 totalled 41,656 person years of effort (PYE), an increase of 6.7% over 2003-04.

Industry

In 2004-05, Manufacturing and Property and business services were the main contributors to total human resources devoted to R&D, at 46.3% and 27.1% respectively. Manufacturing and Mining recorded the largest increases in human resources devoted to R&D from 2003-04, up 592 PYE (3.2%) and 590 PYE (59.8%) respectively. In contrast, the

MAIN FEATURES *continued*

Industry continued

largest decrease over this period was recorded in Communications services (down 75 PYE or 9.2%).

Type of resource

Researchers continued to be the main type of human resource devoted to R&D (55.0% of total PYE). Technicians reported the largest growth in human resource effort devoted to R&D, increasing by 1,597 PYE or 14.2%.

Manufacturing and Property and business services reported the highest levels of PYE across all human resource types. Researchers comprised the lowest proportion of total human resources devoted to R&D in Mining (33.2%), and the highest in Communication services (63.4%). Technicians comprised the lowest proportion of total human resources devoted to R&D in Accommodation, cafes and restaurants (23.9%), and the highest in Personal and other services (45.6%).

Employment size

Businesses with 200 or more employees accounted for 22,495 PYE or 54.0% of total human resources devoted to R&D. Businesses with 0–4 employees contributed 1,602 PYE or 3.8% of the total for all businesses.

EXPENDITURE ON R&D(a), summary statistics

	EXPENDITURE ON R&D			PROPORTION OF TOTAL EXPENDITURE ON R&D		
	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05
	\$'000	\$'000	\$'000	%	%	%
Type of expenditure						
Capital expenditure						
Land, buildings & other structures	115 908	92 828	104 760	1.7	1.2	1.2
Other	360 987	381 014	418 837	5.2	5.0	5.0
<i>Total</i>	476 895	473 842	523 597	6.9	6.2	6.2
Current expenditure						
Labour costs	2 995 386	3 280 986	3 661 774	43.2	42.9	43.4
Other	3 468 011	3 893 242	4 260 873	50.0	50.9	50.4
<i>Total</i>	6 463 397	7 174 228	7 922 647	93.1	93.8	93.8
Source of funds						
Own funds	6 208 524	6 841 501	7 490 583	89.5	89.5	88.7
Other businesses	153 513	202 449	227 528	2.2	2.6	2.7
Commonwealth government	248 957	275 026	330 895	3.6	3.6	3.9
State and local government	11 915	27 729	30 659	0.2	0.4	0.4
Other Australian(b)	44 241	56 926	50 804	0.6	0.7	0.6
Overseas	273 142	244 439	315 774	3.9	3.2	3.7
Location of expenditure						
NSW	2 715 399	2 920 827	3 156 963	39.1	38.2	37.4
Vic.	2 048 823	2 153 457	2 405 046	29.5	28.2	28.5
Qld	819 756	924 524	1 037 227	11.8	12.1	12.3
SA	539 969	582 346	530 341	7.8	7.6	6.3
WA	588 535	769 147	1 051 191	8.5	10.1	12.4
Tas.	60 862	74 903	73 580	0.9	1.0	0.9
NT	np	71 698	30 857	np	0.9	0.4
ACT	43 155	65 365	75 979	0.6	0.9	0.9
AET	np	2 066	—	np	—	—
Overseas	83 452	83 738	85 060	1.2	1.1	1.0
Type of activity						
Pure basic research	56 402	na	69 927	0.8	na	0.8
Strategic basic research	312 676	na	321 950	4.5	na	3.8
Applied research	1 727 659	na	2 607 541	24.9	na	30.9
Experimental development	4 843 555	na	5 446 827	69.8	na	64.5
Total expenditure on R&D	6 940 292	7 648 070	8 446 244	100.0	100.0	100.0

— nil or rounded to zero (including null cells)

na not available

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

(a) 2002-03 and 2003-04 data have been revised. See the Revisions section of the Technical Note for further detail.

(b) Includes 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		
	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05
	\$'000	\$'000	\$'000	%	%	%
Mining	892 732	978 042	1 204 549	12.9	12.8	14.3
Manufacturing						
Food, beverage & tobacco	273 268	291 615	323 287	3.9	3.8	3.8
Textile, clothing, footwear & leather	27 760	40 880	35 121	0.4	0.5	0.4
Wood & paper product	97 730	126 434	115 043	1.4	1.7	1.4
Printing, publishing & recorded media	24 975	45 384	71 170	0.4	0.6	0.8
Petroleum, coal, chemical & assoc. product	476 210	550 496	586 792	6.9	7.2	6.9
Non-metallic mineral product	86 827	96 767	69 890	1.3	1.3	0.8
Metal product	320 553	361 779	413 686	4.6	4.7	4.9
Machinery & equipment						
Motor vehicle & part	618 719	713 404	720 916	8.9	9.3	8.5
Other transport equipment	125 178	177 762	195 427	1.8	2.3	2.3
Photographic & scientific equip.	292 781	302 588	303 584	4.2	4.0	3.6
Electronic equipment	249 169	259 168	249 973	3.6	3.4	3.0
Electrical equipment & appliance	88 854	119 211	98 927	1.3	1.6	1.2
Industrial machinery & equipment	165 023	200 885	206 446	2.4	2.6	2.4
Total	1 539 724	1 773 018	1 775 272	22.2	23.2	21.0
Other manufacturing	20 883	39 920	61 130	0.3	0.5	0.7
Total	2 867 930	3 326 293	3 451 391	41.3	43.5	40.9
Electricity, gas & water supply	71 799	86 162	76 119	1.0	1.1	0.9
Construction	196 794	234 189	297 053	2.8	3.1	3.5
Wholesale trade	392 782	377 480	451 946	5.7	4.9	5.4
Retail trade	26 617	37 708	67 317	0.4	0.5	0.8
Accommodation, cafes & restaurants	np	—	3 101	np	—	—
Transport & storage	35 510	45 162	71 862	0.5	0.6	0.9
Communication services	394 304	259 566	266 926	5.7	3.4	3.2
Finance & insurance	672 872	707 289	863 901	9.7	9.2	10.2
Property & business services						
Scientific research	368 972	433 727	461 838	5.3	5.7	5.5
Technical services	203 540	245 661	313 954	2.9	3.2	3.7
Computer services	612 813	698 575	605 396	8.8	9.1	7.2
Property & business services n.e.c.	142 646	158 822	228 400	2.1	2.1	2.7
Total	1 327 971	1 536 785	1 609 587	19.1	20.1	19.1
Education	np	3 749	1 987	np	—	—
Health & community services	25 082	19 914	33 145	0.4	0.3	0.4
Cultural & recreational services	24 108	21 145	10 605	0.3	0.3	0.1
Personal & other services	6 646	14 586	36 755	0.1	0.2	0.4
Total	6 940 292	7 648 070	8 446 244	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) 2002-03 and 2003-04 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

	<i>Capital expenditure</i>	<i>Labour costs</i>	<i>Other</i>	<i>Total</i>	<i>Total expenditure on R&D</i>
	\$'000	\$'000	\$'000	\$'000	\$'000
Mining	74 669	170 471	959 409	1 129 880	1 204 549
Manufacturing					
Food, beverage & tobacco	32 879	148 775	141 633	290 408	323 287
Textile, clothing, footwear & leather	2 924	16 999	15 198	32 197	35 121
Wood & paper product	3 287	30 625	81 130	111 756	115 043
Printing, publishing & recorded media	4 432	33 941	32 798	66 738	71 170
Petroleum, coal, chemical & assoc. product	57 288	230 580	298 924	529 504	586 792
Non-metallic mineral product	12 069	23 496	34 325	57 821	69 890
Metal product	31 268	129 055	253 363	382 418	413 686
Machinery & equipment					
Motor vehicle & part	42 321	366 455	312 140	678 595	720 916
Other transport equipment	11 870	92 328	91 229	183 557	195 427
Photographic & scientific equip.	9 751	162 183	131 650	293 833	303 584
Electronic equipment	11 455	157 667	80 852	238 518	249 973
Electrical equipment & appliance	5 235	51 211	42 481	93 692	98 927
Industrial machinery & equipment	10 559	95 872	100 015	195 887	206 446
<i>Total</i>	91 189	925 716	758 367	1 684 083	1 775 272
Other manufacturing	2 038	19 078	40 014	59 092	61 130
<i>Total</i>	237 374	1 558 265	1 655 752	3 214 017	3 451 391
Electricity, gas & water supply	18 321	17 956	39 842	57 798	76 119
Construction	6 739	57 985	232 328	290 314	297 053
Wholesale trade	21 574	241 475	188 898	430 373	451 946
Retail trade	4 591	40 279	22 448	62 726	67 317
Accommodation, cafes & restaurants	np	1 654	np	2 868	3 101
Transport & storage	1 940	24 208	45 714	69 922	71 862
Communication services	9 787	85 444	171 696	257 139	266 926
Finance & insurance	33 810	503 500	326 591	830 091	863 901
Property & business services					
Scientific research	31 051	196 219	234 567	430 786	461 838
Technical services	23 682	161 375	128 897	290 272	313 954
Computer services	22 904	450 650	131 841	582 492	605 396
Property & business services n.e.c.	18 446	122 388	87 566	209 954	228 400
<i>Total</i>	96 084	930 633	582 871	1 513 503	1 609 587
Education	56	1 408	523	1 931	1 987
Health & community services	2 597	16 915	13 633	30 548	33 145
Cultural & recreational services	2 414	6 186	2 005	8 191	10 605
Personal & other services	np	5 397	np	23 347	36 755
Total	523 597	3 661 774	4 260 873	7 922 647	8 446 244

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				Total expenditure on R&D
	Capital expenditure	Labour costs	Other	Total	
	%	%	%	%	
Mining	6.2	14.2	79.6	93.8	100.0
Manufacturing					
Food, beverage & tobacco	10.2	46.0	43.8	89.8	100.0
Textile, clothing, footwear & leather	8.3	48.4	43.3	91.7	100.0
Wood & paper product	2.9	26.6	70.5	97.1	100.0
Printing, publishing & recorded media	6.2	47.7	46.1	93.8	100.0
Petroleum, coal, chemical & assoc. product	9.8	39.3	50.9	90.2	100.0
Non-metallic mineral product	17.3	33.6	49.1	82.7	100.0
Metal product	7.6	31.2	61.2	92.4	100.0
Machinery & equipment					
Motor vehicle & part	5.9	50.8	43.3	94.1	100.0
Other transport equipment	6.1	47.2	46.7	93.9	100.0
Photographic & scientific equip.	3.2	53.4	43.4	96.8	100.0
Electronic equipment	4.6	63.1	32.3	95.4	100.0
Electrical equipment & appliance	5.3	51.8	42.9	94.7	100.0
Industrial machinery & equipment	5.1	46.4	48.4	94.9	100.0
Total	5.1	52.1	42.7	94.9	100.0
Other manufacturing	3.3	31.2	65.5	96.7	100.0
Total	6.9	45.1	48.0	93.1	100.0
Electricity, gas & water supply	24.1	23.6	52.3	75.9	100.0
Construction	2.3	19.5	78.2	97.7	100.0
Wholesale trade	4.8	53.4	41.8	95.2	100.0
Retail trade	6.8	59.8	33.3	93.2	100.0
Accommodation, cafes & restaurants	np	53.3	np	92.5	100.0
Transport & storage	2.7	33.7	63.6	97.3	100.0
Communication services	3.7	32.0	64.3	96.3	100.0
Finance & insurance	3.9	58.3	37.8	96.1	100.0
Property & business services					
Scientific research	6.7	42.5	50.8	93.3	100.0
Technical services	7.5	51.4	41.1	92.5	100.0
Computer services	3.8	74.4	21.8	96.2	100.0
Property & business services n.e.c.	8.1	53.6	38.3	91.9	100.0
Total	6.0	57.8	36.2	94.0	100.0
Education	2.8	70.8	26.3	97.2	100.0
Health & community services	7.8	51.0	41.1	92.2	100.0
Cultural & recreational services	22.8	58.3	18.9	77.2	100.0
Personal & other services	np	14.7	np	63.5	100.0
Total	6.2	43.4	50.4	93.8	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

	<i>Own funds</i>	<i>Other businesses</i>	<i>Commonwealth government</i>	<i>State and local government</i>	<i>Other Australian(a)</i>	<i>Overseas</i>	<i>Total</i>
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Mining	1 145 302	np	1 710	np	378	np	1 204 549
Manufacturing							
Food, beverage & tobacco	303 698	12 329	6 289	np	—	np	323 287
Textile, clothing, footwear & leather	28 075	np	5 983	np	np	—	35 121
Wood & paper product	114 650	np	np	—	np	—	115 043
Printing, publishing & recorded media	69 979	np	np	—	np	—	71 170
Petroleum, coal, chemical & assoc. product	550 317	12 029	20 289	88	1 239	2 831	586 792
Non-metallic mineral product	63 474	np	4 987	np	np	—	69 890
Metal product	382 139	np	17 707	np	148	np	413 686
Machinery & equipment							
Motor vehicle & part	647 834	np	37 476	np	np	np	720 916
Other transport equipment	130 234	729	np	np	np	np	195 427
Photographic & scientific equip.	287 113	7 218	8 828	np	np	—	303 584
Electronic equipment	227 107	2 929	12 520	np	np	6 819	249 973
Electrical equipment & appliance	94 199	np	np	286	—	—	98 927
Industrial machinery & equipment	191 608	7 008	6 978	np	np	—	206 446
<i>Total</i>	<i>1 578 094</i>	<i>21 709</i>	<i>118 904</i>	<i>2 268</i>	<i>1 045</i>	<i>53 251</i>	<i>1 775 272</i>
Other manufacturing	58 366	np	1 916	np	np	np	61 130
<i>Total</i>	<i>3 148 792</i>	<i>60 352</i>	<i>176 684</i>	<i>4 208</i>	<i>3 223</i>	<i>58 131</i>	<i>3 451 391</i>
Electricity, gas & water supply	66 019	np	np	np	np	np	76 119
Construction	294 799	1 087	744	187	np	np	297 053
Wholesale trade	355 942	3 852	9 690	np	np	80 187	451 946
Retail trade	59 509	1 122	3 553	np	336	np	67 317
Accommodation, cafes & restaurants	np	—	np	—	—	—	3 101
Transport & storage	71 475	np	115	—	np	—	71 862
Communication services	218 204	2 036	3 272	np	np	np	266 926
Finance & insurance	855 130	4 168	3 724	np	368	np	863 901
Property & business services							
Scientific research	278 344	48 465	58 896	7 771	35 890	32 471	461 838
Technical services	251 393	25 202	14 641	np	1 403	np	313 954
Computer services	525 358	9 868	33 878	2 192	2 359	31 740	605 396
Property & business services n.e.c.	144 032	28 536	15 404	np	3 406	np	228 400
<i>Total</i>	<i>1 199 127</i>	<i>112 071</i>	<i>122 820</i>	<i>19 273</i>	<i>43 058</i>	<i>113 238</i>	<i>1 609 587</i>
Education	np	—	np	—	—	—	1 987
Health & community services	25 842	1 947	2 913	np	np	—	33 145
Cultural & recreational services	9 750	np	np	np	—	—	10 605
Personal & other services	35 852	645	160	np	np	—	36 755
Total	7 490 583	227 528	330 895	30 659	50 804	315 774	8 446 244

— nil or rounded to zero (including null cells)

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(a) Includes Higher Education and Private Non-Profit organisations.

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

	<i>Own funds</i>	<i>Other businesses</i>	<i>Commonwealth government</i>	<i>State and local government</i>	<i>Other Australian(a)</i>	<i>Overseas</i>	<i>Total</i>
	%	%	%	%	%	%	%
Mining	95.1	np	0.1	np	—	np	100.0
Manufacturing							
Food, beverage & tobacco	93.9	3.8	1.9	np	—	np	100.0
Textile, clothing, footwear & leather	79.9	np	17.0	np	np	—	100.0
Wood & paper product	99.7	np	np	—	np	—	100.0
Printing, publishing & recorded media	98.3	np	np	—	np	—	100.0
Petroleum, coal, chemical & assoc. product	93.8	2.0	3.5	—	0.2	0.5	100.0
Non-metallic mineral product	90.8	np	7.1	np	np	—	100.0
Metal product	92.4	np	4.3	np	—	np	100.0
Machinery & equipment							
Motor vehicle & part	89.9	np	5.2	np	np	np	100.0
Other transport equipment	66.6	0.4	np	np	np	np	100.0
Photographic & scientific equip.	94.6	2.4	2.9	np	np	—	100.0
Electronic equipment	90.9	1.2	5.0	np	np	2.7	100.0
Electrical equipment & appliance	95.2	np	np	0.3	—	—	100.0
Industrial machinery & equipment	92.8	3.4	3.4	np	np	—	100.0
<i>Total</i>	88.9	1.2	6.7	0.1	0.1	3.0	100.0
Other manufacturing	95.5	np	3.1	np	np	np	100.0
<i>Total</i>	91.2	1.7	5.1	0.1	0.1	1.7	100.0
Electricity, gas & water supply	86.7	np	np	np	np	np	100.0
Construction	99.2	0.4	0.3	0.1	np	np	100.0
Wholesale trade	78.8	0.9	2.1	np	np	17.7	100.0
Retail trade	88.4	1.7	5.3	np	0.5	np	100.0
Accommodation, cafes & restaurants	np	—	np	—	—	—	100.0
Transport & storage	99.5	np	0.2	—	np	—	100.0
Communication services	81.7	0.8	1.2	np	np	np	100.0
Finance & insurance	99.0	0.5	0.4	np	—	np	100.0
Property & business services							
Scientific research	60.3	10.5	12.8	1.7	7.8	7.0	100.0
Technical services	80.1	8.0	4.7	np	0.4	np	100.0
Computer services	86.8	1.6	5.6	0.4	0.4	5.2	100.0
Property & business services n.e.c.	63.1	12.5	6.7	np	1.5	np	100.0
<i>Total</i>	74.5	7.0	7.6	1.2	2.7	7.0	100.0
Education	np	—	np	—	—	—	100.0
Health & community services	78.0	5.9	8.8	np	np	—	100.0
Cultural & recreational services	91.9	np	np	np	—	—	100.0
Personal & other services	97.5	1.8	0.4	np	np	—	100.0
Total	88.7	2.7	3.9	0.4	0.6	3.7	100.0

— nil or rounded to zero (including null cells)

(a) Includes Higher Education and Private Non-Profit organisations.

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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</i>
	\$'000	\$'000	\$'000	\$'000	\$'000
Mining	6 924	54 780	379 225	763 620	1 204 549
Manufacturing					
Food, beverage & tobacco	3 045	15 816	72 028	232 398	323 287
Textile, clothing, footwear & leather	1 867	3 416	6 484	23 354	35 121
Wood & paper product	251	1 909	12 201	100 682	115 043
Printing, publishing & recorded media	856	4 892	22 490	42 934	71 170
Petroleum, coal, chemical & assoc. product	5 550	17 218	143 609	420 416	586 792
Non-metallic mineral product	382	4 795	25 627	39 087	69 890
Metal product	2 038	10 183	86 602	314 864	413 686
Machinery & equipment					
Motor vehicle & part	2 684	4 041	65 016	649 176	720 916
Other transport equipment	155	1 404	93 271	100 599	195 427
Photographic & scientific equip.	2 356	9 191	128 060	163 977	303 584
Electronic equipment	2 768	7 634	88 465	151 106	249 973
Electrical equipment & appliance	2 463	3 159	21 080	72 224	98 927
Industrial machinery & equipment	3 876	8 585	56 178	137 806	206 446
<i>Total</i>	14 302	34 013	452 069	1 274 888	1 775 272
Other manufacturing	1 025	2 739	30 313	27 053	61 130
<i>Total</i>	29 314	94 979	851 422	2 475 676	3 451 391
Electricity, gas & water supply	664	2 449	21 639	51 368	76 119
Construction	1 053	4 842	188 084	103 075	297 053
Wholesale trade	3 657	14 762	121 851	311 676	451 946
Retail trade	1 066	6 423	16 773	43 054	67 317
Accommodation, cafes & restaurants	np	—	np	2 091	3 101
Transport & storage	746	5 846	38 616	26 654	71 862
Communication services	np	np	102 648	130 172	266 926
Finance & insurance	2 468	15 184	188 463	657 786	863 901
Property & business services					
Scientific research	3 758	33 057	227 085	197 936	461 838
Technical services	1 414	10 373	146 931	155 235	313 954
Computer services	9 159	29 989	210 697	355 550	605 396
Property & business services n.e.c.	2 080	15 454	92 741	118 126	228 400
<i>Total</i>	16 412	88 873	677 455	826 847	1 609 587
Education	np	97	np	1 055	1 987
Health & community services	478	2 390	11 610	18 666	33 145
Cultural & recreational services	np	np	3 956	5 603	10 605
Personal & other services	1 141	1 596	4 534	29 484	36 755
Total	69 927	321 950	2 607 541	5 446 827	8 446 244

— 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</i>
	%	%	%	%	%
Mining	0.6	4.5	31.5	63.4	100.0
Manufacturing					
Food, beverage & tobacco	0.9	4.9	22.3	71.9	100.0
Textile, clothing, footwear & leather	5.3	9.7	18.5	66.5	100.0
Wood & paper product	0.2	1.7	10.6	87.5	100.0
Printing, publishing & recorded media	1.2	6.9	31.6	60.3	100.0
Petroleum, coal, chemical & assoc. product	0.9	2.9	24.5	71.6	100.0
Non-metallic mineral product	0.5	6.9	36.7	55.9	100.0
Metal product	0.5	2.5	20.9	76.1	100.0
Machinery & equipment					
Motor vehicle & part	0.4	0.6	9.0	90.0	100.0
Other transport equipment	0.1	0.7	47.7	51.5	100.0
Photographic & scientific equip.	0.8	3.0	42.2	54.0	100.0
Electronic equipment	1.1	3.1	35.4	60.4	100.0
Electrical equipment & appliance	2.5	3.2	21.3	73.0	100.0
Industrial machinery & equipment	1.9	4.2	27.2	66.8	100.0
<i>Total</i>	0.8	1.9	25.5	71.8	100.0
Other manufacturing	1.7	4.5	49.6	44.3	100.0
<i>Total</i>	0.8	2.8	24.7	71.7	100.0
Electricity, gas & water supply	0.9	3.2	28.4	67.5	100.0
Construction	0.4	1.6	63.3	34.7	100.0
Wholesale trade	0.8	3.3	27.0	69.0	100.0
Retail trade	1.6	9.5	24.9	64.0	100.0
Accommodation, cafes & restaurants	np	—	np	67.4	100.0
Transport & storage	1.0	8.1	53.7	37.1	100.0
Communication services	np	np	38.5	48.8	100.0
Finance & insurance	0.3	1.8	21.8	76.1	100.0
Property & business services					
Scientific research	0.8	7.2	49.2	42.9	100.0
Technical services	0.5	3.3	46.8	49.4	100.0
Computer services	1.5	5.0	34.8	58.7	100.0
Property & business services n.e.c.	0.9	6.8	40.6	51.7	100.0
<i>Total</i>	1.0	5.5	42.1	51.4	100.0
Education	np	4.9	np	53.1	100.0
Health & community services	1.4	7.2	35.0	56.3	100.0
Cultural & recreational services	np	np	37.3	52.8	100.0
Personal & other services	3.1	4.3	12.3	80.2	100.0
Total	0.8	3.8	30.9	64.5	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
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Mining	286 200	63 840	354 012	36 953	451 952	8 178	3 414	1 204 549
Manufacturing								
Food, beverage & tobacco	120 209	111 054	40 989	19 555	19 857	np	np	323 287
Textile, clothing, footwear & leather	6 049	20 509	1 793	2 385	3 754	np	np	35 121
Wood & paper product	16 478	51 956	14 389	10 350	np	np	np	115 043
Printing, publishing & recorded media	25 815	36 931	5 781	1 297	np	—	np	71 170
Petroleum, coal, chemical & assoc. product	157 621	297 345	27 436	33 571	49 340	9 917	11 562	586 792
Non-metallic mineral product	28 100	14 143	14 387	1 351	8 532	np	np	69 890
Metal product	156 705	61 788	54 949	51 257	68 568	19 804	615	413 686
Machinery & equipment								
Motor vehicle & part	25 644	608 247	15 152	np	np	np	np	720 916
Other transport equipment	59 301	17 952	67 033	np	np	np	np	195 427
Photographic & scientific equip.	113 699	59 317	20 083	np	20 024	np	12 360	303 584
Electronic equipment	130 674	55 931	14 325	14 758	23 043	10 519	723	249 973
Electrical equipment & appliance	44 921	15 452	10 770	20 236	7 377	np	np	98 927
Industrial machinery & equipment	71 944	35 094	30 017	6 983	53 638	np	np	206 446
Total	446 183	791 992	157 380	177 590	132 394	37 480	32 254	1 775 272
Other manufacturing	32 430	10 369	12 295	1 739	2 949	1 348	—	61 130
Total	989 589	1 396 087	329 398	299 096	304 641	84 313	48 267	3 451 391
Electricity, gas & water supply	10 265	20 272	6 321	12 538	22 773	np	np	76 119
Construction	122 072	60 924	28 369	2 837	73 260	np	np	297 053
Wholesale trade	215 408	129 923	32 358	42 544	23 038	5 124	3 551	451 946
Retail trade	28 245	18 457	9 912	4 233	4 517	1 744	209	67 317
Accommodation, cafes & restaurants	np	—	np	—	np	—	—	3 101
Transport & storage	37 340	np	np	9 671	614	np	np	71 862
Communication services	171 765	85 787	3 719	np	4 096	928	np	266 926
Finance & insurance	697 306	124 425	12 530	8 050	17 127	np	np	863 901
Property & business services								
Scientific research	142 909	150 534	81 378	32 511	21 142	18 098	15 266	461 838
Technical services	75 932	89 916	35 412	39 970	61 491	10 682	550	313 954
Computer services	227 566	170 038	98 398	25 275	50 127	31 149	2 844	605 396
Property & business services n.e.c.	112 943	54 045	25 227	15 071	12 217	5 573	3 324	228 400
Total	559 350	464 533	240 415	112 827	144 977	65 502	21 984	1 609 587
Education	774	np	np	—	np	334	np	1 987
Health & community services	13 382	10 293	5 028	1 081	1 690	np	np	33 145
Cultural & recreational services	4 776	1 506	3 271	np	np	—	np	10 605
Personal & other services	np	13 998	1 413	—	1 060	np	np	36 755
Total	3 156 963	2 405 046	1 037 227	530 341	1 051 191	180 416	85 060	8 446 244

— nil or rounded to zero (including null cells)

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

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

	NSW	Vic.	Qld	SA	WA	Other states and territories(a)	Overseas	Total
	%	%	%	%	%	%	%	%
Mining	23.8	5.3	29.4	3.1	37.5	0.7	0.3	100.0
Manufacturing								
Food, beverage & tobacco	37.2	34.4	12.7	6.0	6.1	np	np	100.0
Textile, clothing, footwear & leather	17.2	58.4	5.1	6.8	10.7	np	np	100.0
Wood & paper product	14.3	45.2	12.5	9.0	np	np	np	100.0
Printing, publishing & recorded media	36.3	51.9	8.1	1.8	np	—	np	100.0
Petroleum, coal, chemical & assoc. product	26.9	50.7	4.7	5.7	8.4	1.7	2.0	100.0
Non-metallic mineral product	40.2	20.2	20.6	1.9	12.2	np	np	100.0
Metal product	37.9	14.9	13.3	12.4	16.6	4.8	0.1	100.0
Machinery & equipment								
Motor vehicle & part	3.6	84.4	2.1	np	np	np	np	100.0
Other transport equipment	30.3	9.2	34.3	np	np	np	np	100.0
Photographic & scientific equip.	37.5	19.5	6.6	np	6.6	np	4.1	100.0
Electronic equipment	52.3	22.4	5.7	5.9	9.2	4.2	0.3	100.0
Electrical equipment & appliance	45.4	15.6	10.9	20.5	7.5	np	np	100.0
Industrial machinery & equipment	34.8	17.0	14.5	3.4	26.0	np	np	100.0
Total	25.1	44.6	8.9	10.0	7.5	2.1	1.8	100.0
Other manufacturing	53.1	17.0	20.1	2.8	4.8	2.2	—	100.0
Total	28.7	40.4	9.5	8.7	8.8	2.4	1.4	100.0
Electricity, gas & water supply	13.5	26.6	8.3	16.5	29.9	np	np	100.0
Construction	41.1	20.5	9.6	1.0	24.7	np	np	100.0
Wholesale trade	47.7	28.7	7.2	9.4	5.1	1.1	0.8	100.0
Retail trade	42.0	27.4	14.7	6.3	6.7	2.6	0.3	100.0
Accommodation, cafes & restaurants	np	—	np	—	np	—	—	100.0
Transport & storage	52.0	np	np	13.5	0.9	np	np	100.0
Communication services	64.3	32.1	1.4	np	1.5	0.3	np	100.0
Finance & insurance	80.7	14.4	1.5	0.9	2.0	np	np	100.0
Property & business services								
Scientific research	30.9	32.6	17.6	7.0	4.6	3.9	3.3	100.0
Technical services	24.2	28.6	11.3	12.7	19.6	3.4	0.2	100.0
Computer services	37.6	28.1	16.3	4.2	8.3	5.1	0.5	100.0
Property & business services n.e.c.	49.4	23.7	11.0	6.6	5.3	2.4	1.5	100.0
Total	34.8	28.9	14.9	7.0	9.0	4.1	1.4	100.0
Education	39.0	np	np	—	np	16.8	np	100.0
Health & community services	40.4	31.1	15.2	3.3	5.1	np	np	100.0
Cultural & recreational services	45.0	14.2	30.8	np	np	—	np	100.0
Personal & other services	np	38.1	3.8	—	2.9	np	np	100.0
Total	37.4	28.5	12.3	6.3	12.4	2.1	1.0	100.0

— nil or rounded to zero (including null cells)

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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
	\$'000	\$'000	\$'000	\$'000	\$'000
Mining	80 404	31 269	115 879	976 997	1 204 549
Manufacturing					
Food, beverage & tobacco	1 771	11 248	34 663	275 605	323 287
Textile, clothing, footwear & leather	1 318	3 340	14 399	16 064	35 121
Wood & paper product	np	np	19 768	93 700	115 043
Printing, publishing & recorded media	np	10 486	18 682	np	71 170
Petroleum, coal, chemical & assoc. product	12 454	34 948	121 997	417 393	586 792
Non-metallic mineral product	np	np	17 340	47 422	69 890
Metal product	2 557	10 113	102 016	299 000	413 686
Machinery & equipment					
Motor vehicle & part	533	7 251	25 868	687 264	720 916
Other transport equipment	3 098	3 549	22 713	166 067	195 427
Photographic & scientific equip.	9 321	30 671	82 750	180 842	303 584
Electronic equipment	6 319	24 827	84 742	134 085	249 973
Electrical equipment & appliance	6 409	12 417	31 957	48 144	98 927
Industrial machinery & equipment	6 659	29 130	84 160	86 497	206 446
Total	32 339	107 845	332 189	1 302 899	1 775 272
Other manufacturing	np	6 554	45 926	np	61 130
Total	56 960	189 876	706 980	2 497 575	3 451 391
Electricity, gas & water supply	np	3 602	np	61 577	76 119
Construction	3 082	9 504	20 491	263 976	297 053
Wholesale trade	13 704	48 651	106 205	283 386	451 946
Retail trade	5 520	24 265	34 972	2 560	67 317
Accommodation, cafes & restaurants	np	np	np	—	3 101
Transport & storage	1 017	5 044	11 437	54 364	71 862
Communication services	2 359	18 829	12 537	233 201	266 926
Finance & insurance	9 963	19 201	28 676	806 061	863 901
Property & business services					
Scientific research	np	177 009	225 185	np	461 838
Technical services	23 680	85 263	112 732	92 279	313 954
Computer services	33 758	150 098	288 827	132 713	605 396
Property & business services n.e.c.	np	49 946	71 643	np	228 400
Total	129 271	462 315	698 387	319 613	1 609 587
Education	555	np	np	—	1 987
Health & community services	np	5 981	16 004	np	33 145
Cultural & recreational services	1 259	np	2 817	np	10 605
Personal & other services	1 350	4 454	3 633	27 318	36 755
Total	314 172	827 172	1 768 689	5 536 211	8 446 244

— 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
	%	%	%	%	%
Mining	6.7	2.6	9.6	81.1	100.0
Manufacturing					
Food, beverage & tobacco	0.5	3.5	10.7	85.3	100.0
Textile, clothing, footwear & leather	3.8	9.5	41.0	45.7	100.0
Wood & paper product	np	np	17.2	81.4	100.0
Printing, publishing & recorded media	np	14.7	26.2	np	100.0
Petroleum, coal, chemical & assoc. product	2.1	6.0	20.8	71.1	100.0
Non-metallic mineral product	np	np	24.8	67.9	100.0
Metal product	0.6	2.4	24.7	72.3	100.0
Machinery & equipment					
Motor vehicle & part	0.1	1.0	3.6	95.3	100.0
Other transport equipment	1.6	1.8	11.6	85.0	100.0
Photographic & scientific equip.	3.1	10.1	27.3	59.6	100.0
Electronic equipment	2.5	9.9	33.9	53.6	100.0
Electrical equipment & appliance	6.5	12.6	32.3	48.7	100.0
Industrial machinery & equipment	3.2	14.1	40.8	41.9	100.0
Total	1.8	6.1	18.7	73.4	100.0
Other manufacturing	np	10.7	75.1	np	100.0
Total	1.7	5.5	20.5	72.4	100.0
Electricity, gas & water supply	np	4.7	np	80.9	100.0
Construction	1.0	3.2	6.9	88.9	100.0
Wholesale trade	3.0	10.8	23.5	62.7	100.0
Retail trade	8.2	36.0	52.0	3.8	100.0
Accommodation, cafes & restaurants	np	np	np	—	100.0
Transport & storage	1.4	7.0	15.9	75.7	100.0
Communication services	0.9	7.1	4.7	87.4	100.0
Finance & insurance	1.2	2.2	3.3	93.3	100.0
Property & business services					
Scientific research	np	38.3	48.8	np	100.0
Technical services	7.5	27.2	35.9	29.4	100.0
Computer services	5.6	24.8	47.7	21.9	100.0
Property & business services n.e.c.	np	21.9	31.4	np	100.0
Total	8.0	28.7	43.4	19.9	100.0
Education	27.9	np	np	—	100.0
Health & community services	np	18.0	48.3	np	100.0
Cultural & recreational services	11.9	np	26.6	np	100.0
Personal & other services	3.7	12.1	9.9	74.3	100.0
Total	3.7	9.8	20.9	65.5	100.0

— nil or rounded to zero (including null cells)

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

	<i>Actual expenditure on R&D 2004–05</i>	<i>Expected expenditure on R&D 2005–06(a)</i>	<i>Estimated growth in R&D</i>
	\$'000	\$'000	%
Mining	1 204 549	1 238 970	2.9
Manufacturing			
Food, beverage & tobacco	323 287	290 555	-10.1
Textile, clothing, footwear & leather	35 121	37 235	6.0
Wood & paper product	115 043	111 206	-3.3
Printing, publishing & recorded media	71 170	71 332	0.2
Petroleum, coal, chemical & assoc. product	586 792	723 611	23.3
Non-metallic mineral product	69 890	72 402	3.6
Metal product	413 686	420 929	1.8
Machinery & equipment			
Motor vehicle & part	720 916	807 841	12.1
Other transport equipment	195 427	155 231	-20.6
Photographic & scientific equip.	303 584	355 593	17.1
Electronic equipment	249 973	254 562	1.8
Electrical equipment & appliance	98 927	98 654	-0.3
Industrial machinery & equipment	206 446	181 955	-11.9
Total	1 775 272	1 853 836	4.4
Other manufacturing	61 130	56 719	-7.2
Total	3 451 391	3 637 825	5.4
Electricity, gas & water supply	76 119	66 330	-12.9
Construction	297 053	216 467	-27.1
Wholesale trade	451 946	431 096	-4.6
Retail trade	67 317	67 112	-0.3
Accommodation, cafes & restaurants	3 101	np	np
Transport & storage	71 862	67 405	-6.2
Communication services	266 926	252 897	-5.3
Finance & insurance	863 901	855 508	-1.0
Property & business services			
Scientific research	461 838	504 732	9.3
Technical services	313 954	298 892	-4.8
Computer services	605 396	639 250	5.6
Property & business services n.e.c.	228 400	231 439	1.3
Total	1 609 587	1 674 313	4.0
Education	1 987	np	np
Health & community services	33 145	37 124	12.0
Cultural & recreational services	10 605	8 384	-20.9
Personal & other services	36 755	23 525	-36.0
Total	8 446 244	8 582 276	1.6

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(a) See paragraph 16 of the Explanatory Notes.

	EXPENDITURE ON R&D			PROPORTION OF TOTAL EXPENDITURE ON R&D		
	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05
	\$'000	\$'000	\$'000	%	%	%
DEFENCE	232 973	242 839	263 620	3.4	3.2	3.1
ECONOMIC DEVELOPMENT						
Plant production & plant primary products	75 910	99 899	108 091	1.1	1.3	1.3
Animal production & animal primary products	44 058	52 700	52 689	0.6	0.7	0.6
Mineral resources (excl. energy)						
Primary mining & extraction processes	285 949	376 242	440 951	4.1	4.9	5.2
First stage treatment of ores & minerals	217 700	202 979	246 549	3.1	2.7	2.9
Other mineral resources (excl. energy)	90 828	90 247	83 564	1.3	1.2	1.0
Total	594 477	669 468	771 064	8.6	8.8	9.1
Energy resources	454 152	477 346	660 240	6.5	6.2	7.8
Energy supply	186 290	170 194	233 433	2.7	2.2	2.8
Manufacturing						
Processed food products & beverages	253 276	287 988	320 007	3.6	3.8	3.8
Wood, wood products & paper	81 854	111 397	107 718	1.2	1.5	1.3
Human pharmaceutical products	326 751	369 194	456 410	4.7	4.8	5.4
Industrial chemicals & related products	154 731	219 958	190 609	2.2	2.9	2.3
Basic metal products (incl. smelting)	142 195	117 058	117 045	2.0	1.5	1.4
Fabricated metal products	151 089	178 231	184 945	2.2	2.3	2.2
Transport equipment	649 476	784 527	860 875	9.4	10.3	10.2
Computer hardware & electronic equipment	142 297	149 865	163 770	2.1	2.0	1.9
Communication equipment	143 769	113 454	126 535	2.1	1.5	1.5
Instrumentation	67 369	68 387	77 316	1.0	0.9	0.9
Machinery & equipment	166 579	253 801	260 634	2.4	3.3	3.1
Other manufactured products	205 648	215 959	175 481	3.0	2.8	2.1
Manufacturing n.e.c.	188 696	180 010	218 524	2.7	2.4	2.6
Total	2 673 730	3 049 828	3 259 869	38.5	39.9	38.6
Construction	227 093	329 736	368 560	3.3	4.3	4.4
Transport	103 719	134 244	153 101	1.5	1.8	1.8
Information & communication services						
Computer software & services	568 826	679 267	795 527	8.2	8.9	9.4
Communication services	557 493	418 945	379 889	8.0	5.5	4.5
Other information & communication services	80 187	38 808	25 539	1.2	0.5	0.3
Total	1 206 506	1 137 020	1 200 955	17.4	14.9	14.2
Commercial services & tourism						
Finance, property & business services	672 291	748 402	830 949	9.7	9.8	9.8
Other commercial services	62 092	68 179	49 394	0.9	0.9	0.6
Commercial services & tourism n.e.c.	66 621	63 694	74 844	1.0	0.8	0.9
Total	801 004	880 276	955 187	11.5	11.5	11.3
Economic framework	13 485	15 026	20 284	0.2	0.2	0.2
Total	6 380 424	7 015 736	7 783 473	91.9	91.7	92.2
SOCIETY						
Health	226 451	266 460	277 159	3.3	3.5	3.3
Education & training	13 346	17 312	14 495	0.2	0.2	0.2
Social development & community services	26 224	34 265	32 406	0.4	0.4	0.4
Total	266 021	318 037	324 060	3.8	4.2	3.8
ENVIRONMENT						
Environmental policy frameworks & other aspects	16 940	18 618	7 697	0.2	0.2	0.1
Environmental management	38 206	50 119	62 203	0.6	0.7	0.7
Total	55 146	68 737	69 900	0.8	0.9	0.8
NON-ORIENTED RESEARCH	5 728	2 720	5 191	0.1	—	0.1
Total	6 940 292	7 648 070	8 446 244	100.0	100.0	100.0

— nil or rounded to zero (including null cells)

(a) 2002–03 and 2003–04 data have been revised. See the Revisions section of the Technical Note for further detail.

	EXPENDITURE ON R&D			PROPORTION OF TOTAL EXPENDITURE ON R&D		
	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05
	\$'000	\$'000	\$'000	%	%	%
Mathematical sciences	30 405	22 599	14 002	0.4	0.3	0.2
Physical sciences	49 501	45 813	40 657	0.7	0.6	0.5
Chemical sciences	202 666	209 517	211 721	2.9	2.7	2.5
Earth sciences	120 784	147 255	119 974	1.7	1.9	1.4
Biological sciences	189 849	227 917	193 031	2.7	3.0	2.3
Information, computing & communication sciences						
Information systems	709 360	712 426	871 700	10.2	9.3	10.3
Computer software	805 819	918 758	949 202	11.6	12.0	11.2
Other information, computing & comm. sciences	242 913	241 568	199 428	3.5	3.2	2.4
Information, computing & comm. sciences n.e.c.	135 669	175 119	188 746	2.0	2.3	2.2
<i>Total</i>	1 893 760	2 047 871	2 209 076	27.3	26.8	26.2
Engineering & technology						
Industrial biotechnology & food sciences	192 188	194 753	253 815	2.8	2.5	3.0
Manufacturing engineering	503 110	592 277	610 727	7.2	7.7	7.2
Automotive engineering	614 514	715 991	738 810	8.9	9.4	8.7
Mechanical & industrial engineering	197 732	243 326	276 977	2.8	3.2	3.3
Resources engineering	619 075	722 251	990 755	8.9	9.4	11.7
Civil engineering	131 059	157 945	312 889	1.9	2.1	3.7
Electrical & electronic engineering	268 478	251 932	237 259	3.9	3.3	2.8
Metallurgy	301 235	274 138	313 822	4.3	3.6	3.7
Materials engineering	124 909	150 671	200 044	1.8	2.0	2.4
Communications technologies	462 640	374 223	347 432	6.7	4.9	4.1
Other engineering & technology	93 075	124 722	103 568	1.3	1.6	1.2
Engineering & technology n.e.c.	298 418	403 065	434 162	4.3	5.3	5.1
<i>Total</i>	3 806 435	4 205 294	4 820 259	54.8	55.0	57.1
Agricultural, veterinary & environmental sciences	196 562	222 703	224 693	2.8	2.9	2.7
Architecture, urban environment & building	37 351	33 073	21 746	0.5	0.4	0.3
Medical & health sciences						
Pharmacology & pharmaceutical sciences	122 618	148 072	137 767	1.8	1.9	1.6
Clinical sciences	129 657	146 520	156 161	1.9	1.9	1.8
Medical & health sciences n.e.c.	125 992	160 272	254 319	1.8	2.1	3.0
<i>Total</i>	378 267	454 864	548 246	5.5	5.9	6.5
Education	2 854	6 280	6 822	—	0.1	0.1
Economics	5 539	5 550	5 915	0.1	0.1	0.1
Commerce, management, tourism & services	23 367	15 422	22 530	0.3	0.2	0.3
Policy & political science	—	—	np	—	—	np
Studies in human society	107	221	823	—	—	—
Behavioural & cognitive sciences	583	899	862	—	—	—
Law, justice & law enforcement	np	453	np	np	—	np
Journalism, librarianship & curatorial studies	np	np	np	np	np	np
The arts	1 447	2 212	5 190	—	—	0.1
Language & culture	np	np	41	np	np	—
History & archaeology	np	np	np	np	np	np
Philosophy & religion	np	—	np	np	—	np
Total	6 940 292	7 648 070	8 446 244	100.0	100.0	100.0

— nil or rounded to zero (including null cells)

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(a) 2002–03 and 2003–04 data have been revised. See the Revisions section of the Technical Note for further detail.

HUMAN RESOURCES DEVOTED TO R&D(a), by type of resource and industry

	HUMAN RESOURCE EFFORT ON R&D			PROPORTION OF TOTAL HUMAN RESOURCE EFFORT ON R&D		
	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05
	PYE	PYE	PYE	%	%	%
Type of resource						
Researchers	20 451	22 328	22 899	56.9	57.2	55.0
Technicians	10 668	11 271	12 868	29.7	28.9	30.9
Other supporting staff	4 819	5 428	5 889	13.4	13.9	14.1
Industry						
Mining	751	987	1 577	2.1	2.5	3.8
Manufacturing						
Food, beverage & tobacco	1 584	1 607	1 740	4.4	4.1	4.2
Textile, clothing, footwear & leather	195	247	255	0.5	0.6	0.6
Wood & paper product	359	317	442	1.0	0.8	1.1
Printing, publishing & recorded media	235	280	483	0.7	0.7	1.2
Petroleum, coal, chemical & assoc. product	2 532	2 630	2 766	7.0	6.7	6.6
Non-metallic mineral product	379	356	304	1.1	0.9	0.7
Metal product	1 315	1 245	1 656	3.7	3.2	4.0
Machinery & equipment						
Motor vehicle & part	3 646	3 815	3 939	10.1	9.8	9.5
Other transport equipment	1 110	1 179	1 279	3.1	3.0	3.1
Photographic & scientific equip.	2 033	2 196	2 161	5.7	5.6	5.2
Electronic equipment	1 998	2 254	1 831	5.6	5.8	4.4
Electrical equipment & appliance	671	871	814	1.9	2.2	2.0
Industrial machinery & equipment	1 238	1 505	1 340	3.4	3.9	3.2
Total	10 695	11 820	11 363	29.8	30.3	27.3
Other manufacturing	200	197	283	0.6	0.5	0.7
Total	17 494	18 700	19 292	48.7	47.9	46.3
Electricity, gas & water supply	185	194	235	0.5	0.5	0.6
Construction	675	741	756	1.9	1.9	1.8
Wholesale trade	2 659	2 506	2 755	7.4	6.4	6.6
Retail trade	219	269	587	0.6	0.7	1.4
Accommodation, cafes & restaurants	np	—	29	np	—	0.1
Transport & storage	210	198	284	0.6	0.5	0.7
Communication services	1 092	818	743	3.0	2.1	1.8
Finance & insurance	2 928	3 350	3 639	8.1	8.6	8.7
Property & business services						
Scientific research	1 732	2 251	2 235	4.8	5.8	5.4
Technical services	1 404	1 579	1 900	3.9	4.0	4.6
Computer services	5 360	6 001	5 446	14.9	15.4	13.1
Property & business services n.e.c.	859	1 072	1 697	2.4	2.7	4.1
Total	9 354	10 903	11 277	26.0	27.9	27.1
Education	53	46	43	0.1	0.1	0.1
Health & community services	140	152	271	0.4	0.4	0.7
Cultural & recreational services	150	122	98	0.4	0.3	0.2
Personal & other services	np	43	72	np	0.1	0.2
Total	35 939	39 027	41 656	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) 2002–03 and 2003–04 data have been revised. See the Revisions section of the Technical Note for further detail.

	Researchers	Technicians	Other supporting staff	Total
	PYE	PYE	PYE	PYE
Mining	523	605	450	1 577
Manufacturing				
Food, beverage & tobacco	692	707	342	1 740
Textile, clothing, footwear & leather	93	90	73	255
Wood & paper product	153	103	187	442
Printing, publishing & recorded media	191	243	49	483
Petroleum, coal, chemical & assoc. product	1 470	796	500	2 766
Non-metallic mineral product	116	108	80	304
Metal product	665	640	350	1 656
Machinery & equipment				
Motor vehicle & part	2 353	1 216	369	3 939
Other transport equipment	370	603	306	1 279
Photographic & scientific equip.	1 530	411	219	2 161
Electronic equipment	1 198	494	139	1 831
Electrical equipment & appliance	459	276	79	814
Industrial machinery & equipment	639	424	278	1 340
Total	6 548	3 424	1 390	11 363
Other manufacturing	115	68	101	283
Total	10 042	6 178	3 072	19 292
Electricity, gas & water supply	148	59	28	235
Construction	375	208	173	756
Wholesale trade	1 700	721	334	2 755
Retail trade	327	175	84	587
Accommodation, cafes & restaurants	np	7	np	29
Transport & storage	143	97	45	284
Communication services	471	196	76	743
Finance & insurance	2 112	1 146	381	3 639
Property & business services				
Scientific research	1 187	749	298	2 235
Technical services	1 148	500	253	1 900
Computer services	3 452	1 598	396	5 446
Property & business services n.e.c.	1 003	458	236	1 697
Total	6 790	3 304	1 183	11 277
Education	np	11	np	43
Health & community services	145	88	38	271
Cultural & recreational services	43	42	12	98
Personal & other services	32	33	7	72
Total	22 899	12 868	5 889	41 656

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

	Researchers	Technicians	Other supporting staff	Total
	%	%	%	%
Mining	33.2	38.3	28.5	100.0
Manufacturing				
Food, beverage & tobacco	39.7	40.6	19.6	100.0
Textile, clothing, footwear & leather	36.4	35.1	28.5	100.0
Wood & paper product	34.5	23.2	42.3	100.0
Printing, publishing & recorded media	39.5	50.3	10.2	100.0
Petroleum, coal, chemical & assoc. product	53.1	28.8	18.1	100.0
Non-metallic mineral product	38.3	35.4	26.3	100.0
Metal product	40.2	38.7	21.2	100.0
Machinery & equipment				
Motor vehicle & part	59.7	30.9	9.4	100.0
Other transport equipment	28.9	47.2	23.9	100.0
Photographic & scientific equip.	70.8	19.0	10.2	100.0
Electronic equipment	65.4	27.0	7.6	100.0
Electrical equipment & appliance	56.4	33.9	9.7	100.0
Industrial machinery & equipment	47.6	31.6	20.7	100.0
Total	57.6	30.1	12.2	100.0
Other manufacturing	40.4	23.9	35.6	100.0
Total	52.1	32.0	15.9	100.0
Electricity, gas & water supply	63.0	25.0	11.9	100.0
Construction	49.6	27.5	22.9	100.0
Wholesale trade	61.7	26.2	12.1	100.0
Retail trade	55.8	29.9	14.3	100.0
Accommodation, cafes & restaurants	np	23.9	np	100.0
Transport & storage	50.2	34.0	15.9	100.0
Communication services	63.4	26.3	10.3	100.0
Finance & insurance	58.0	31.5	10.5	100.0
Property & business services				
Scientific research	53.1	33.5	13.4	100.0
Technical services	60.4	26.3	13.3	100.0
Computer services	63.4	29.3	7.3	100.0
Property & business services n.e.c.	59.1	27.0	13.9	100.0
Total	60.2	29.3	10.5	100.0
Education	np	25.0	np	100.0
Health & community services	53.5	32.4	14.1	100.0
Cultural & recreational services	44.4	43.3	12.3	100.0
Personal & other services	44.9	45.6	9.6	100.0
Total	55.0	30.9	14.1	100.0

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
	PYE	PYE	PYE	PYE	PYE
Mining	22	88	187	1 281	1 577
Manufacturing					
Food, beverage & tobacco	7	60	191	1 482	1 740
Textile, clothing, footwear & leather	6	28	103	118	255
Wood & paper product	—	19	122	301	442
Printing, publishing & recorded media	18	87	203	176	483
Petroleum, coal, chemical & assoc. product	77	220	730	1 740	2 766
Non-metallic mineral product	7	26	127	144	304
Metal product	25	83	604	944	1 656
Machinery & equipment					
Motor vehicle & part	4	78	233	3 623	3 939
Other transport equipment	17	27	158	1 077	1 279
Photographic & scientific equip.	41	176	542	1 402	2 161
Electronic equipment	55	202	629	945	1 831
Electrical equipment & appliance	38	103	243	430	814
Industrial machinery & equipment	35	231	626	449	1 340
Total	190	817	2 430	7 925	11 363
Other manufacturing	14	60	181	29	283
Total	344	1 400	4 691	12 858	19 292
Electricity, gas & water supply	8	np	np	173	235
Construction	29	88	131	507	756
Wholesale trade	125	355	830	1 445	2 755
Retail trade	62	252	265	9	587
Accommodation, cafes & restaurants	np	np	np	—	29
Transport & storage	9	48	42	185	284
Communication services	12	92	123	516	743
Finance & insurance	54	120	171	3 294	3 639
Property & business services					
Scientific research	np	760	1 204	np	2 235
Technical services	np	463	754	np	1 900
Computer services	368	1 607	2 485	986	5 446
Property & business services n.e.c.	136	480	546	535	1 697
Total	879	3 310	4 989	2 098	11 277
Education	np	18	np	—	43
Health & community services	36	68	116	50	271
Cultural & recreational services	12	23	23	39	98
Personal & other services	1	9	24	38	72
Total	1 602	5 900	11 659	22 495	41 656

— 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
	%	%	%	%	%
Mining	1.4	5.5	11.9	81.2	100.0
Manufacturing					
Food, beverage & tobacco	0.4	3.5	11.0	85.2	100.0
Textile, clothing, footwear & leather	2.5	11.0	40.2	46.3	100.0
Wood & paper product	—	4.2	27.6	68.2	100.0
Printing, publishing & recorded media	3.7	18.0	41.9	36.4	100.0
Petroleum, coal, chemical & assoc. product	2.8	8.0	26.4	62.9	100.0
Non-metallic mineral product	2.2	8.6	41.9	47.3	100.0
Metal product	1.5	5.0	36.5	57.0	100.0
Machinery & equipment					
Motor vehicle & part	0.1	2.0	5.9	92.0	100.0
Other transport equipment	1.3	2.1	12.4	84.2	100.0
Photographic & scientific equip.	1.9	8.1	25.1	64.9	100.0
Electronic equipment	3.0	11.0	34.3	51.6	100.0
Electrical equipment & appliance	4.6	12.7	29.9	52.8	100.0
Industrial machinery & equipment	2.6	17.2	46.7	33.5	100.0
Total	1.7	7.2	21.4	69.7	100.0
Other manufacturing	4.9	21.0	63.8	10.2	100.0
Total	1.8	7.3	24.3	66.6	100.0
Electricity, gas & water supply	3.5	np	np	73.9	100.0
Construction	3.9	11.6	17.3	67.2	100.0
Wholesale trade	4.5	12.9	30.1	52.5	100.0
Retail trade	10.5	42.9	45.1	1.5	100.0
Accommodation, cafes & restaurants	np	np	np	—	100.0
Transport & storage	3.2	16.9	14.7	65.1	100.0
Communication services	1.6	12.3	16.5	69.5	100.0
Finance & insurance	1.5	3.3	4.7	90.5	100.0
Property & business services					
Scientific research	np	34.0	53.9	np	100.0
Technical services	np	24.4	39.7	np	100.0
Computer services	6.8	29.5	45.6	18.1	100.0
Property & business services n.e.c.	8.0	28.3	32.2	31.5	100.0
Total	7.8	29.4	44.2	18.6	100.0
Education	np	41.2	np	—	100.0
Health & community services	13.4	25.2	42.9	18.5	100.0
Cultural & recreational services	12.4	23.7	23.6	40.3	100.0
Personal & other services	1.9	11.8	33.9	52.4	100.0
Total	3.8	14.2	28.0	54.0	100.0

— nil or rounded to zero (including null cells)

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

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 2005. The survey was conducted by mail questionnaire and a 92.6% 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

	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
GDP	545 736	577 422	607 863	645 153	689 340	735 783	782 798	838 251	893 704

Source: *National Income, Expenditure and Product, Australian National Accounts, March Quarter 2006* (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
2002-03	275 358	197 266	132 432	53 635	85 470	13 502	9 042	16 091
2003-04	290 746	212 243	144 701	56 737	92 339	14 794	9 381	17 309
2004-05	305 437	222 022	158 506	59 819	100 900	16 114	10 418	18 306

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

STATISTICAL UNIT

3 The statistical unit used to represent businesses and for which statistics are reported is, in most cases, the Australian Business Number (ABN) unit. The ABN unit is the business unit which has registered for an ABN and thus appears on the Australian Taxation Office (ATO) administered Australian Business Register (ABR). This unit is suitable for ABS statistical needs when the business is simple in structure. For more significant and diverse businesses where the ABN unit is not suitable for ABS statistical needs, the statistical unit used is the Type of Activity Unit (TAU). A TAU is comprised of 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. Further details about the ABS economic statistical units used in this survey and in other ABS economic surveys (both sample and census) can be found in Chapter 2 of the *Standard Economic Sector Classifications of Australia (SESCA) 2002* (cat. no. 1218.0).

4 During 2004-05, a comprehensive revision of ABN units (in scope of the R&D survey) took place, resulting in a number of ABN units being merged and replaced with TAU units. As a consequence of these changes, business counts from the 2004-05 survey onwards will not be comparable to previously released figures. Business counts may be available on request, subject to caveats.

Definitions

5 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.

EXPLANATORY NOTES *continued*

Definitions continued

6 For a more comprehensive interpretation of the definition 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

7 The ABS R&D survey includes all businesses within the business sector of Australia, excluding those mainly engaged in Agriculture, forestry and fishing (i.e. Division A of the *Australian and New Zealand Standard Industrial Classification (ANZSIC), 1993* (cat. no. 1292.0)). This is partly because of collection difficulties and partly because such businesses are believed to have low R&D activity (agricultural R&D activity is generally carried out by specialised research institutes not included in ANZSIC Division A).

8 The business sector includes all businesses (whose primary activity is the production of goods and services for sale to the general public at a price intended to cover at least the costs of production) and the private non-profit institutions mainly serving them.

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

COVERAGE

10 The R&D survey comprises a complete enumeration of businesses identified by the ABS as likely to have carried out R&D activity.

11 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;
- were identified as likely to have R&D activity from other sources such as newspapers, industrial journals, research compendia etc.; or
- indicated that R&D activity had been performed in the reference year via a coverage questionnaire.

INDUSTRY CLASSIFICATION

12 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.

13 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 laid down in the Frascati Manual.

EMPLOYMENT SIZE

14 Employment size relates to the number of persons employed by the business during the last pay period in June 2005.

SOCIO-ECONOMIC OBJECTIVE (SEO) AND RESEARCH FIELDS, COURSES AND DISCIPLINES CLASSIFICATIONS (RFCD)

15 Statistics classified by SEO and RFCD 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.

EXPECTED EXPENDITURE

16 Comprises an estimate of R&D expenditure for the following financial year by businesses that performed R&D in the reference period covered by this publication. Excluded from this estimate is expected R&D expenditure for business that did not perform R&D in the current reference period.

EXPLANATORY NOTES *continued*

CHAIN VOLUME MEASURES (CVM)

17 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

18 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 2005, *Innovation in Australian Business 2003*, cat. no. 8158.0, ABS, Canberra
Australian Bureau of Statistics 2004, *Research and Experimental Development, All Sector Summary, Australia, 2002-03*, cat. no. 8112.0, ABS, Canberra
Australian Bureau of Statistics 2004, *Research and Experimental Development, Government and Private Non-Profit Organisations, Australia, 2002-03*, cat. no. 8109.0, ABS, Canberra
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

19 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

20 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

21 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 are 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 2004–05 expected R&D expenditure provided in 2003–04.

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 only occur for significant changes to the data, where the impact from individual businesses is \$5 million or more. Revisions are only applied up to two cycles prior to the current cycle.

8 In 2004–05, changes to statistical units resulted in substantial improvement to the industry classification of businesses included in the ABS R&D survey. As a consequence, industry level estimates included in this publication for 2002–03 and 2003–04 are significantly revised from those previously published.

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.
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	The 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 RFCD classification is primarily structured around disciplines or activities. In short, it describes the nature of the research being performed.
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.

GLOSSARY *continued*

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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