

INNOVATION IN AUSTRALIAN BUSINESS

EMBARGO: 11.30AM (CANBERRA TIME) WED 8 MAR 2006

C O N T E N T S

	<i>page</i>
Notes	2
List of tables	3

CHAPTERS

1 Main features	5
2 Innovation, business longevity and foreign ownership	18
3 Barriers to innovation	20
4 Drivers of innovation	28
5 Collaboration	37
6 Sources of ideas and methods of acquiring knowledge or abilities	42
7 Skills and capabilities sought	50
8 Intellectual property protection methods	57
9 Novelty and source of innovation	62
10 Financial information	64

ADDITIONAL INFORMATION

Explanatory notes	75
Technical notes – Data quality	80
Glossary	84

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 Glynis Orrell on Perth (08) 9360 5104.

INTRODUCTION

This publication presents the results of the third Innovation survey conducted by the Australian Bureau of Statistics (ABS). The 1993–94 survey covered a range of industry sectors. A more detailed survey was conducted in respect of 1996–97 but only covered Manufacturing and Mining industries. The 2003 survey was broader in scope and covers businesses in all ANZSIC divisions with the exception of Agriculture, forestry and fishing; Government administration and defence; Education; Health and community services and Personal and other services divisions. It also excluded businesses with less than five employees and those classified to General Government in the Standard Institutional Sector Classification of Australia (SISCA).

The 2003 survey collected details of innovation and expenditure. It was based on concepts and standard questions developed jointly by the Organisation for Economic Co-operation and Development (OECD) and Eurostat. The concepts have been published in '*OECD Proposed Guidelines for Collecting and Interpreting Technological Innovation Data*' (OECD, Paris, 1997), known as the Oslo Manual.

The survey was largely consistent with international frameworks outlined in the Oslo Manual and will provide comparability with several international surveys, most notably the Eurostat Community Innovation Surveys. The central aspect of the Oslo Manual, and most innovation surveys conducted internationally, has been the measurement of technological innovation. While technological innovation has been one of the key drivers of economic growth over the past few decades, there is a growing realisation that non-technological innovation may also contribute significantly. The Oslo Manual is now being revised to take this into account. For the Innovation Survey 2003, the ABS went beyond current guidelines to separately identify non-technological innovation.

DEFINING INNOVATION

For the purposes of this collection the ABS has defined the term innovation as the process of introducing new or significantly improved goods or services and/or implementing new or significantly improved processes. New goods or services or new processes may involve the development of new technology, an adaptation of existing technology to a new use (e.g. electronic commerce), or may be non-technological in nature (e.g. organisational and managerial change, some changes in marketing).

Innovation has been classified into three categories. These categories are defined as:

- A *new good or service* means any good or service or combination of these which is new to a business. Its characteristics or intended uses differ significantly from those previously produced.
- A *new operational process* is a significant change for a business in its methods of producing or delivering goods or services.
- A *new organisational/managerial process* is a significant change to the strategies, structures or routines of the business which aim to improve performance.

Peter Harper
Acting Australian Statistician

LIST OF TABLES

page

MAIN FEATURES

1.1	Summary of innovation, 2001–2003, by selected business characteristics	14
1.2	Types of innovation undertaken, 2001–2003, by selected business characteristics	15
1.3	Contribution to innovation, 2003, innovating businesses, proportion of total, by states and territories	16
1.4	Contribution to innovation, 2003, innovating businesses, proportion of total, by industry	17

INNOVATION, BUSINESS LONGEVITY AND FOREIGN OWNERSHIP

2.1	Length of current business ownership, as at December 2003	19
2.2	Business ownership, as at December 2003	19

BARRIERS TO INNOVATION

3.1	Barriers to innovation, 2001–2003, by employment size	22
3.2	Barriers to innovation, 2001–2003, by states and territories	23
3.3	Barriers to innovation, 2001–2003, by industry	25

DRIVERS OF INNOVATION

4.1	Drivers of innovation, 2001–2003, innovating businesses, by employment size	30
4.2	Drivers of innovation, 2001–2003, innovating businesses, by states and territories	31
4.3	Drivers of innovation, 2001–2003, innovating businesses, by industry	33

COLLABORATION

5.1	Collaboration during 2003, innovating businesses, by employment size	39
5.2	Collaboration during 2003, innovating businesses, by industry	40
5.3	Collaboration during 2003, innovating businesses, by type and location of business with which collaboration occurred	41

SOURCES OF IDEAS AND METHODS OF ACQUIRING KNOWLEDGE OR ABILITIES

6.1	Sources of ideas or information, 2001–2003, innovating businesses, by employment size	44
6.2	Sources of ideas or information, 2001–2003, innovating businesses, by states and territories	45

SOURCES OF IDEAS AND METHODS OF ACQUIRING KNOWLEDGE OR ABILITIES *continued*

6.3	Sources of ideas or information, 2001–2003, innovating businesses, by industry	46
6.4	Methods used to acquire knowledge or abilities during 2003, innovating businesses, by method used and location of source	48
6.5	Methods used to acquire knowledge or abilities during 2003, innovating businesses, by method used and type of institution	49

STAFF SKILLS AND CAPABILITIES SOUGHT

7.1	Skills and capabilities sought, 2001–2003, innovating businesses, by employment size	52
7.2	Skills and capabilities sought, 2001–2003, innovating businesses, by states and territories	53
7.3	Skills and capabilities sought, 2001–2003, innovating businesses, by industry	54
7.4	Recruitment sources, 2001–2003, innovating businesses	56

INTELLECTUAL PROPERTY PROTECTION METHODS

8.1	Intellectual property protection methods used during 2003, innovating businesses, by employment size	59
8.2	Intellectual property protection methods used during 2003, innovating businesses, by states and territories	60
8.3	Intellectual property protection methods used during 2003, innovating businesses, by industry	61

NOVELTY AND SOURCE OF INNOVATION

9.1	Characteristics of new goods or services introduced, 2001–2003, innovating businesses	63
9.2	Characteristics of new operational processes implemented, 2001–2003, innovating businesses	63

FINANCIAL INFORMATION

10.1	Innovation expenditure as a proportion of total business expenditure, 2002–03, innovating businesses, by employment size	67
10.2	Innovation expenditure as a proportion of total business expenditure, 2002–03, innovating businesses, by states and territories	68
10.3	Innovation expenditure as a proportion of total business expenditure, 2002–03, innovating businesses, by industry	69
10.4	Source of funds for innovation expenditure, 2002–03, innovating businesses, by employment size	71
10.5	Source of funds for innovation expenditure, 2002–03, innovating businesses, by states and territories	72
10.6	Source of funds for innovation expenditure, 2002–03, innovating businesses, by industry	73
10.7	Research and experimental development expenditure, 2002–03, all businesses, by type of expenditure	74

CHAPTER 1

MAIN FEATURES

INTRODUCTION

Innovation, both technological and non-technological, is seen as a key driver of economic growth. Innovation in business is characterised by the introduction of new or significantly improved goods or services and/or the implementation of new or significantly improved processes (which includes operational and organisational/managerial processes).

BUSINESSES THAT INNOVATED

During the three years ended December 2003 innovation was undertaken by 34.8% of businesses. A higher proportion of businesses innovating (22.9%) implemented new or significantly improved operational processes than introduced new or significantly improved goods or services (16.6%).

INNOVATION IN AUSTRALIAN BUSINESS (a), 2001–2003

	(%)
Proportion of businesses which introduced or implemented	
Any new or significantly improved goods or services	16.6
Any new or significantly improved operational processes	22.9
Any new or significantly improved organisational/managerial processes	21.4
Any new goods, services or processes	34.8

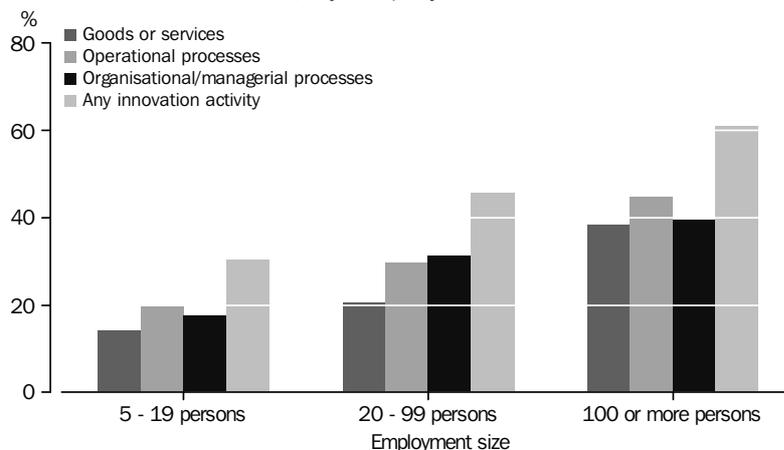
(a) Proportions are of all businesses with more than 4 persons employed.

Business size

The extent of innovation varied according to the employment size of the business, ranging from 30.4% for businesses with 5–19 persons, up to 60.8% for businesses with 100 or more persons. For businesses with 5–19 persons and those with 100 or more persons, the most common form of innovation was the implementation of new or significantly improved operational processes. For businesses with 20–99 persons it was the implementation of new or significantly improved organisational/managerial processes.

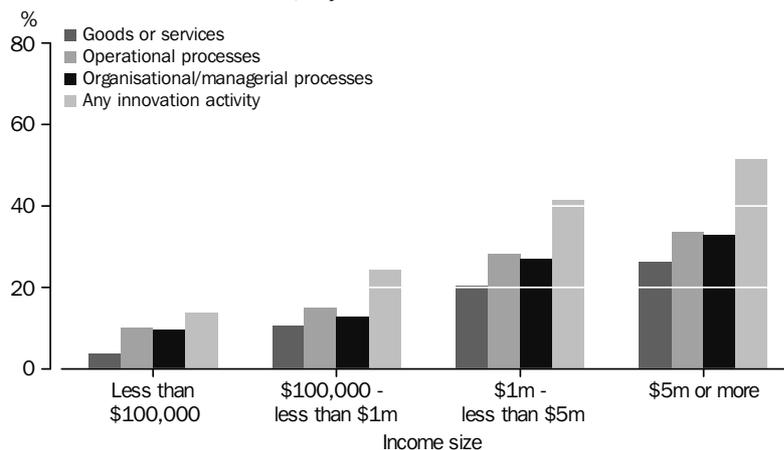
Business size continued

PROPORTION OF BUSINESSES INNOVATING, 2001–2003, Types of innovation undertaken, by employment size



When comparing proportions of innovation by business income size range, the proportion of businesses innovating increases as income increases.

PROPORTION OF BUSINESSES INNOVATING, 2001–2003, Types of innovation undertaken, by income size



State/Territory/Region

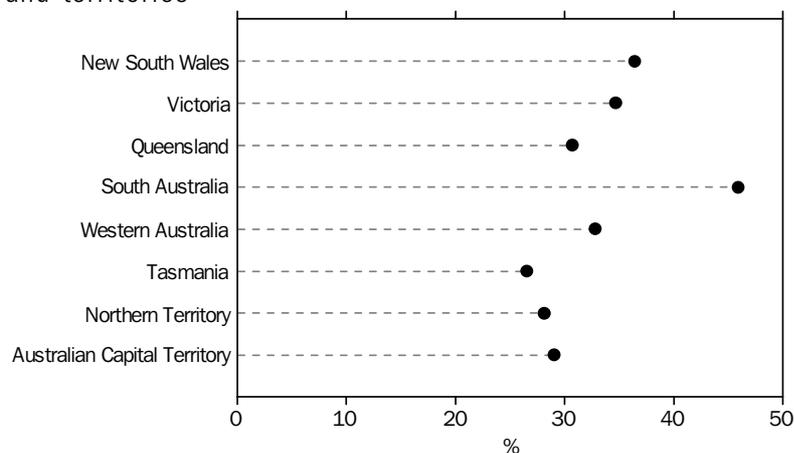
Innovation was classified to the state or territory of the head office for businesses with operations in more than one state or territory. The majority of innovating businesses were in New South Wales and Victoria, but South Australia had the highest proportion of businesses undertaking innovation (45.9%). The proportions of businesses innovating in New South Wales, Victoria, Queensland and Western Australia were similar at around 30–35%. In Tasmania, Northern Territory and the Australian Capital Territory the proportion of businesses innovating was lower.

South Australia had the highest proportion of businesses which innovated under all three types of innovation. New South Wales, Victoria, Queensland, Western Australia and the Australian Capital Territory had similar proportions of businesses which implemented new or significantly improved operational processes and organisational/managerial processes (ranging between 20.6% and 23.0%). After South Australia, with 23.8% of businesses, New South Wales (17.8%) and Victoria (17.1%) had the next highest proportions of those introducing new or significantly improved goods or services.

*State/Territory/Region
continued*

There was little difference in the level of innovation reported between those businesses located in Capital cities and those in other areas.

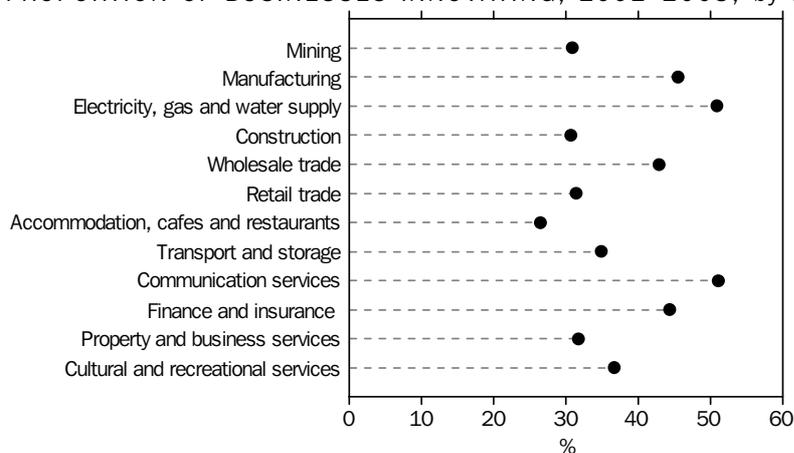
PROPORTION OF BUSINESSES INNOVATING, 2001–2003, by states and territories



Industry

Just over half of the businesses in the Communication services (51.1%) and Electricity, gas and water supply (50.8%) industries undertook innovation. Businesses in the Accommodation, cafes and restaurants (26.5%) and Construction industries (30.7%) had the lowest proportion of businesses innovating.

PROPORTION OF BUSINESSES INNOVATING, 2001–2003, by industry



Main characteristics

The characteristics of innovating businesses are presented in detail in subsequent chapters. The main characteristics most frequently reported by innovating businesses are:

- More innovating businesses (62.3%) reported that cost related barriers hampered their innovation than any other barriers.
- Profit related drivers were selected by more innovating businesses as the key reasons they developed new goods or services (71.4%) or new operational processes (71.5%).
- 27.0% of innovating businesses were involved in collaborative activities, mostly collaborating with suppliers, clients, competitors or consultants (25.1%).

*Main characteristics
continued*

- The majority of innovating businesses reported sourcing ideas or information internally to develop new goods or services or new processes (87.7%). Some 39.9% of innovating businesses reported that employing new skilled staff was the main method used to acquire knowledge or abilities to introduce these goods, services and processes.
- General business skills were sought by 31.6% of innovating businesses to develop, introduce or implement new goods or services, and by 29.4% for new processes.
- Formal methods were used by 21.5% of innovating businesses to protect intellectual property, while informal methods were used by 36.6%.

EXPENDITURE ON
INNOVATION AND
RELATED ACTIVITIES

Total expenditure on innovation and related activities includes expenditure on research and experimental development. Total expenditure by all businesses on innovation and related activities in 2002–03 was \$20,296.6 million, which is a gross estimate that includes acquired research and development expenditure. This was 1.7% of total business expenditure. Innovating businesses spent \$18,923.9 million on innovation and related activities which was 2.4% of their total expenditure.

EXPENDITURE ON INNOVATION AND RELATED ACTIVITIES, 2002–03 (a) (b)

	INNOVATING BUSINESSES		ALL BUSINESSES	
	Expenditure	Proportion of total expenditure	Expenditure	Proportion of total expenditure
		\$m		%
Expenditure on research and experimental development(c)(d)	5 800.6	0.7	7 167.0	0.6
Expenditure on innovation	^ 13 123.4	^ 1.7	^ 13 129.6	^ 1.1
Total expenditure on innovation and related activities(d)	^ 18 923.9	^ 2.4	^ 20 296.6	^ 1.7

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

(a) Expenditure estimates should be used with care, see Technical Notes for more detail.

(b) Data relates to the most recent financial year ended on or before 30 September 2003.

(c) See Explanatory Notes paragraph 19 on comparisons with the Research and Experimental Development collection.

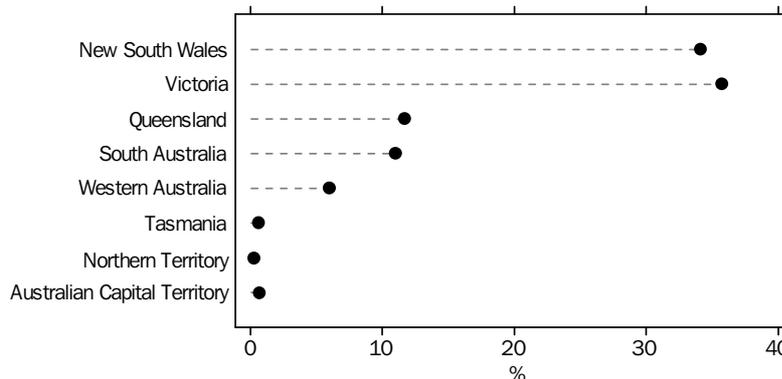
(d) Includes \$914.2 million of expenditure on acquired research and experimental development by innovating businesses and \$1017.8 million by all businesses.

EXPENDITURE ON
INNOVATION BY
INNOVATING BUSINESSES

Total expenditure on innovation in 2002–03 by innovating businesses was \$13,123.4 million. Innovating businesses in Victoria contributed 35.7% to the total expenditure on innovation even though they comprised 25.5% of innovating businesses in Australia. New South Wales was the next highest contributor to the total expenditure on innovation with 34.8%. Apart from Victoria, South Australia was the only other state or territory to contribute more to the total Australian expenditure on innovation (11.0%) than they contributed to the total number of innovative businesses in Australia (8.5%).

EXPENDITURE ON INNOVATION BY INNOVATING BUSINESSES
continued

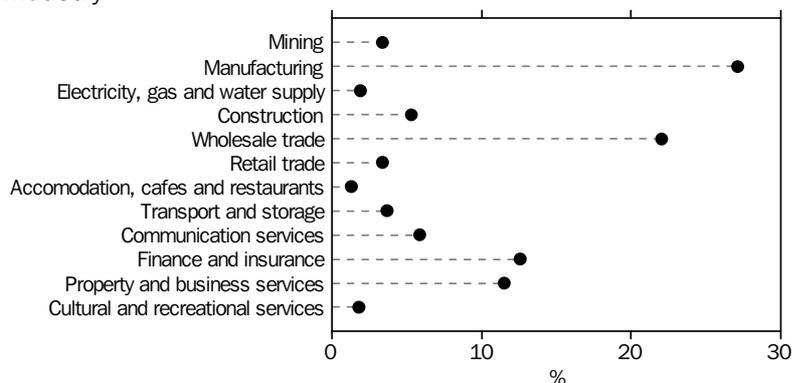
CONTRIBUTION TO EXPENDITURE ON INNOVATION (a), 2002–03, by states and territories



(a) The innovation expenditure estimates should be used with care, see the Technical Notes for more detail.

The Manufacturing industry contributed the highest proportion (27.1%) to the total Australian expenditure on innovation. Industries where the proportion of total expenditure on innovation was more than double that industry's proportion of total Australian innovating businesses were the Mining, Electricity, gas and water supply, Communication services and Finance and insurance industries.

CONTRIBUTION TO EXPENDITURE ON INNOVATION (a), 2002–03, by industry



(a) The innovation expenditure estimates should be used with care, see the Technical Notes for more detail.

HISTORICAL COMPARISON
Manufacturing industry

Data from the 1993–94 and 1996–97 Innovation in Manufacturing surveys are compared to the 2003 Innovation survey data below. The data from 2003 exclude the implementation of new or significantly improved organisational/managerial processes as this information was not collected in the earlier surveys. See paragraph 13 of the Explanatory Notes for more detail on data comparability.

Overall, the proportion of businesses innovating in the Manufacturing industry decreased slightly from 41.7% in 1991–94 to 39.5% in 2001–03, though the proportion in 2003 was higher than 1994–97 (36.4%). The Wood and paper products industry had the most noticeable change in the proportion of businesses innovating increasing from 18.6% in 1991–94 to 35.8% in 2001–03. The largest decrease was in the Non-metallic mineral products industry, which dropped from 44.5% in 1991–94 to 31.0% in 2001–03. Petroleum, coal, chemical and associated products industry has maintained a high

*Manufacturing industry
continued*

proportion of businesses innovating during the three time periods, only decreasing slightly from 55.0% in 1991–94 to 51.4% in 2001–03.

MANUFACTURING INDUSTRY, 1991–94, 1994–97 AND 2001–03,
Proportion of businesses innovating(a)(b)

	1991–94	1994–97	2001–3
	%	%	%
Food, beverages and tobacco	42.6	34.4	36.7
Textiles, clothing, footwear and leather	36.2	34.8	30.7
Wood and paper products	18.6	16.6	35.8
Printing, publishing and recorded media	42.8	34.8	44.6
Petroleum, coal, chemical and associated products	55.0	53.3	51.4
Non-metallic mineral products	44.5	42.7	31.0
Metal products	39.4	30.5	34.9
Machinery and equipment	55.0	44.1	48.3
Other manufacturing	35.1	38.8	28.9
Total manufacturing	41.7	36.4	39.5

- (a) Data from 2001–03 excludes the implementation of new or significantly improved organisational/managerial processes.
- (b) Data from 1991–94 and 1994–97 are in respect of financial years whereas 2001–03 is in respect of calendar years.

There was a decrease in the proportion of businesses innovating that introduced new or significantly improved goods or services, from 36.8% in 1991–94 down to 27.1% in 2001–03. The Wood and paper products was the only industry that increased over this time period, up from 15.5% in 1991–94 to 19.3% in 2001–03. Over the same time period there were noticeable decreases in the proportion of businesses innovating in both Non-metallic mineral products (down from 42.0% to 20.9%) and Petroleum, coal, chemical and associated products (down from 54.4% to 37.1%).

The proportion of businesses innovating that implemented new or significantly improved operational processes decreased slightly from 30.5% in 1991–94 to 29.7% in 2001–03. The Wood and paper products industry was the only industry that increased over this time period, up from 13.3% in 1991–94 to 30.0% in 2001–03. Over the same time period the proportion of businesses innovating in the Non-metallic mineral products industry decreased from 42.0% to 20.9%.

*Manufacturing industry
continued*

MANUFACTURING INDUSTRY, 1991–94, 1994–97 AND 2001–03(a),
Proportion of businesses innovating

	BUSINESSES WHICH INTRODUCED OR IMPLEMENTED					
	Any new or significantly improved goods or services			Any new or significantly improved operational processes		
	1991–94	1994–97	2001–03	1991–94	1994–97	2001–03
	%	%	%	%	%	%
Food, beverages and tobacco	38.8	31.3	25.6	33.4	30.6	32.6
Textiles, clothing, footwear and leather	31.7	32.8	23.0	28.0	30.1	20.7
Wood and paper products	15.5	12.3	19.3	13.3	12.4	30.0
Printing, publishing and recorded media	28.1	25.4	27.7	38.8	24.8	35.0
Petroleum, coal, chemical and associated products	54.4	40.1	37.1	40.8	40.5	34.8
Non-metallic mineral products	42.0	36.3	20.9	35.0	31.4	24.4
Metal products	34.8	29.0	26.4	26.3	16.0	24.3
Machinery and equipment	52.0	41.7	34.6	36.9	30.0	34.6
Other manufacturing	30.4	33.9	19.7	23.7	26.9	22.6
Total manufacturing	36.8	31.9	27.1	30.5	26.0	29.7

(a) Data from 1991–94 and 1994–97 are in respect of financial years whereas 2001–03 is in respect of calendar years.

INTERNATIONAL
COMPARISONS
European Union (EU)

Eurostat, the Statistical Office of the European Communities, released *Innovation in Europe: Results for the EU, Iceland and Norway, 2004* in respect of data for the 1998–2001 calendar years. Eurostat information can be accessed from the europa server at <www.europa.eu.int/comm/eurostat>. The definition of innovation used by Eurostat, and used in the table below, is the introduction or implementation of any new or significantly improved goods or services and/or operational processes. Data from the ABS *Innovation in Australian Business 2003* has been made comparable to the Eurostat data by excluding businesses with less than 10 employees and aligning industries. This process results in higher proportions of businesses innovating compared to elsewhere in this publication. Data from Australia in this table also exclude organisational/managerial processes. See paragraph 15 of the Explanatory Notes for more detail.

After adjustments, the total proportion of businesses innovating in Australia (41%) is equivalent to that of the EU as a whole. The proportion of Australian businesses innovating in the Industry Sector (46%) ranks seventh when compared to European countries, while those in the Services Sector (39%) rank ninth.

European Union (EU)

continued

AUSTRALIA, 2001-2003, AND EUROPEAN UNION, 1998-2001(a)(b),
Businesses innovating, by selected industries

TOTAL PROPORTION OF INNOVATING BUSINESSES		PROPORTION OF INNOVATING BUSINESSES IN INDUSTRY SECTOR(c)		PROPORTION OF INNOVATING BUSINESSES IN SERVICES SECTOR(d)	
Country	%	Country	%	Country	%
Germany	54	Germany	60	Iceland	53
Iceland	51	Belgium	59	Portugal	49
Belgium	50	Netherlands	51	Germany	49
Ireland	45	Iceland	50	Luxembourg	44
Luxembourg	45	Denmark	49	Belgium	42
Portugal	44	Luxembourg	47	Austria	42
Austria	43	AUSTRALIA	46	Sweden	40
Denmark	42	TOTAL EU	44	Ireland	39
Netherlands	42	Austria	44	AUSTRALIA	39
AUSTRALIA	41	Finland	43	Finland	37
TOTAL EU	41	Portugal	42	Netherlands	36
Finland	40	Sweden	40	TOTAL EU	36
Sweden	40	France	40	Denmark	34
France	36	Italy	38	Greece	32
Italy	35	Spain	37	Norway	30
Norway	33	Norway	35	France	29
Spain	32	United Kingdom	32	United Kingdom	26
United Kingdom	29	Greece	26	Italy	24
Greece	27	Ireland	na	Spain	23

na not available

- (a) EU figures sourced from "Innovation in Europe; Results from the EU, Iceland and Norway, 1998-2001", Eurostat, 2004.
- (b) Eurostat data refers to the three calendar years ended 2000, except Norway where the data refers to the three calendar years ended 2001.
- (c) The industry sector is defined as Statistical Classification of Economic Activities in the European Community (NACE) Sections C to E - see paragraph 15 of the Explanatory Notes.
- (d) The services sector is defined as NACE Division 51, Sections I and J, Divisions 72 and 73 and Groups 74.2 and 74.3 - see paragraph 15 of the Explanatory Notes.

New Zealand

Statistics New Zealand conducted a business innovation survey in respect of the three years ended August 2003, releasing the publication *Innovation in New Zealand 2003*, in July 2004. Statistics New Zealand information can be accessed from the web site <www.stats.govt.nz>. The New Zealand survey differed in definition, scope and coverage. Broad data from the ABS *Innovation in Australian Business 2003* has been made comparable by excluding businesses with less than 10 employees and aligning industries. Data from Australia in this table also exclude organisational/managerial processes. See paragraph 17 of the Explanatory Notes for more detail. The definition of innovation used for the New Zealand survey, and used in the table below, is the introduction or implementation of any new or significantly improved goods or services and/or operational processes.

The proportion of businesses innovating in New Zealand was 42%, compared with 40% in Australia. Some differences occurred at the industry level in the proportion of businesses innovating. The proportion for the Communication services industry in Australia (53%) was higher than New Zealand (43%), while the proportion for the Manufacturing industry in New Zealand (52%) was higher than Australia (47%). The proportions in other industries differed by between 3 and 20 percentage points.

New Zealand continued

AUSTRALIAN AND NEW ZEALAND COMPARISON, 2003 , businesses innovating, by selected industries

	AUSTRALIA(a)		NEW ZEALAND(b)(c)	
	<i>Total number of businesses</i>	<i>Proportion of businesses innovating</i>	<i>Total number of businesses</i>	<i>Proportion of businesses innovating</i>
	No.	%	No.	%
Mining	498	29	57	32
Manufacturing	12 817	47	3 522	52
Electricity, gas and water supply	148	45	12	25
Construction	6 360	32	1 209	24
Wholesale trade	7 687	41	1 767	42
Transport and storage	3 289	35	885	33
Communication services	303	53	87	41
Finance and insurance	1 840	46	282	50
Business services	11 130	37	2 181	40
Total selected industries	44 072	40	10 002	42

(a) Australia data refers to three calendar years.

(b) New Zealand data sourced from "Innovation in New Zealand 2003", Stats New Zealand 2004.

(c) New Zealand data refers to three years ended August 2003.

1.1**SUMMARY OF INNOVATION, 2001–2003(a), by selected business characteristics**

	<i>Total number of businesses as at December 2003(b)</i>	<i>Number of businesses innovating(b)</i>	<i>Proportion of businesses innovating (c)</i>
	No.	No.	%
.....			
Employment size			
5–19 persons	102 009	31 036	30.4
20–99 persons	28 583	13 061	45.7
100 or more persons	5 244	3 186	60.8
Income size			
Less than \$100 000	9 160	^ 1 251	13.7
\$100 000–less than \$1m	51 902	12 749	^ 24.6
\$1m–less than \$5m	52 257	21 686	41.5
\$5m or more	22 517	11 596	51.5
States and territories			
New South Wales	48 279	17 586	36.4
Victoria	34 807	12 070	34.7
Queensland	24 519	7 519	30.7
South Australia	8 802	4 038	45.9
Western Australia	13 416	4 399	32.8
Tasmania	2 553	676	^ 26.5
Northern Territory	1 121	315	^ 28.1
Australian Capital Territory	2 339	680	^ 29.0
Region			
Capital cities	40 409	33 540	35.1
Other areas	95 426	13 742	34.0
Industry			
Mining	722	223	^ 30.9
Manufacturing	18 940	8 621	45.5
Electricity, gas and water supply	191	97	50.8
Construction	12 554	3 860	^ 30.7
Wholesale trade	13 231	5 670	42.9
Retail trade	30 163	9 471	^ 31.4
Accommodation, cafes and restaurants	11 980	3 175	^ 26.5
Transport and storage	5 008	1 748	34.9
Communication services	428	219	^ 51.1
Finance and insurance	3 821	1 694	^ 44.3
Property and business services	34 368	10 880	^ 31.7
Cultural and recreational services	4 429	1 625	36.7
Total(d)	135 836	47 283	34.8

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

(a) Calendar years.

(b) See Explanatory Notes paragraphs 4–10 for the scope, coverage and definition of the business unit used in this survey.

(c) Proportions are of businesses reporting innovation in each category.

(d) Where figures have been rounded, discrepancies may occur between the sum of component items and the total.

1.2 TYPES OF INNOVATION UNDERTAKEN 2001–2003(a), by selected business characteristics

	BUSINESSES WHICH INTRODUCED OR IMPLEMENTED(b)			
	<i>Proportion of businesses innovating</i>	<i>Any new or significantly improved goods or services</i>	<i>Any new or significantly improved operational processes</i>	<i>Any new or significantly improved organisational/ managerial processes</i>
	%	%	%	%
Employment size				
5–19 persons	30.4	14.3	19.8	17.7
20–99 persons	45.7	20.6	29.9	31.3
100 or more persons	60.8	38.4	44.8	39.5
Income size				
Less than \$100 000	*13.7	**3.8	*10.1	*9.7
\$100 000–less than \$1m	^ 24.6	^ 10.6	^ 15.1	^ 12.8
\$1m– less than \$5m	41.5	20.5	28.3	27.1
\$5m or more	51.5	26.3	33.7	32.9
States and territories				
New South Wales	36.4	^ 17.8	^ 23.0	^ 20.9
Victoria	34.7	^ 17.1	^ 22.8	^ 21.1
Queensland	30.7	^ 14.0	^ 21.7	^ 20.6
South Australia	45.9	^ 23.8	^ 30.2	^ 29.8
Western Australia	32.8	^ 13.6	^ 22.2	^ 21.3
Tasmania	^ 26.5	*10.1	*17.5	^ 17.0
Northern Territory	^ 28.1	*11.5	^ 15.4	*17.9
Australian Capital Territory	^ 29.0	*9.2	*22.1	^ 20.6
Region				
Capital cities	35.1	17.6	^ 21.9	^ 22.2
Other areas	34.0	14.1	25.3	19.4
Industry				
Mining	^ 30.9	^ 10.6	^ 18.5	^ 17.9
Manufacturing	45.5	27.1	29.7	24.2
Electricity, gas and water supply	50.8	21.2	33.5	34.9
Construction	^ 30.7	^ 9.8	^ 20.0	^ 22.4
Wholesale trade	42.9	^ 26.1	^ 25.2	^ 27.1
Retail trade	^ 31.4	^ 10.2	^ 21.6	^ 18.4
Accommodation, cafes and restaurants	^ 26.5	^ 10.6	^ 17.8	^ 16.1
Transport and storage	34.9	^ 15.4	^ 25.8	^ 21.3
Communication services	^ 51.1	^ 29.2	^ 40.0	^ 30.4
Finance and insurance	^ 44.3	^ 22.2	^ 26.4	^ 31.7
Property and business services	^ 31.7	^ 16.6	^ 21.6	^ 20.1
Cultural and recreational services	36.7	^ 17.9	^ 20.2	^ 25.4
Total	34.8	16.6	22.9	21.4

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

(a) Calendar years.

(b) Proportions are of businesses reporting innovation in each category.

1.3 CONTRIBUTION TO INNOVATION, 2003, Innovating businesses, Proportion of total, by states and territories(a)

	<i>Innovating businesses(b)</i>	<i>Expenditure on innovation(c)(d)</i>
	%	%
.....		
State/Territory		
New South Wales	37.2	34.1
Victoria	25.5	*35.7
Queensland	15.9	^ 11.7
South Australia	8.5	*11.0
Western Australia	9.3	^ 6.0
Tasmania	^ 1.4	0.6
Northern Territory	^ 0.7	0.3
Australian Capital Territory	^ 1.4	^ 0.7
Australia(e)	100.0	100.0

-
- ^ estimate has a relative standard error of 10% to less than 25% and should be used with caution
- * estimate has a relative standard error of 25% to 50% and should be used with caution
- (a) Innovation was classified to the state or territory of the head office for businesses with operations in more than one state or territory.
- (b) Data relates to the proportion of innovating businesses during the calendar period 2001-2003.
- (c) Innovation refers to the introduction of new goods or services and/or the implementation of new operational and/or organisational/managerial processes.
- (d) Data relates to the most recent financial year ended on or before 30 September 2003.
- (e) Where figures have been rounded, discrepancies may occur between the sum of component items and the total.

1.4**CONTRIBUTION TO INNOVATION, 2003, Innovating businesses, Proportion of total, by industry**

	<i>Innovating businesses(a)</i>	<i>Expenditure on innovation(b)(c)</i>
	%	%
Industry		
Mining	^ 0.5	*3.4
Manufacturing	18.2	27.1
Electricity, gas and water supply	0.2	1.9
Construction	^ 8.2	**5.3
Wholesale trade	12.0	**22.0
Retail trade	^ 20.0	^ 3.4
Accommodation, cafes and restaurants	^ 6.7	^ 1.3
Transport and storage	^ 3.7	^ 3.7
Communication services	0.5	^ 5.9
Finance and insurance	^ 3.6	12.6
Property and business services	^ 23.0	^ 11.5
Cultural and recreational services	3.4	^ 1.8
Total(d)	100.0	100.0

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

(a) Data relates to the proportion of innovating businesses during the calendar period 2001–2003.

(b) Innovation refers to the introduction of new goods or services and/or the implementation of new operational and/or organisational/managerial processes.

(c) Data relates to the most recent financial year ended on or before 30 September 2003.

(d) Where figures have been rounded, discrepancies may occur between the sum of component items and the total.

CHAPTER **2**

INNOVATION, BUSINESS LONGEVITY AND FOREIGN OWNERSHIP

INTRODUCTION

The measurement of the length of current business ownership for innovators may provide insight into when, during the life cycle of a business, innovation is more likely to occur. There is also interest in the innovation profile of firms that have a degree of foreign ownership, and whether initiatives generated overseas lead to innovation in the Australian affiliate.

All businesses were asked how long the business had operated under current ownership and the percentage of foreign ownership at December 2003.

BUSINESS LONGEVITY

The data do not show a strong correlation between length of current business ownership and innovation. Newly formed or acquired businesses (those in operation under current ownership for less than a year) had the lowest proportion of innovating businesses (23.2%). The highest proportion was amongst those innovating businesses that had been in operation for 1 year to less than 4 years (40.6%), but this was not significantly higher than the 4 years to less than 9 years (32.2%) and 9 years or more (35.9%) cohorts.

FOREIGN OWNERSHIP

Foreign ownership appeared to have a stronger influence than length of current business ownership on the likelihood of businesses having innovative activities. Of wholly Australian owned businesses, 33.7% undertook innovation during the past three calendar years. In contrast, 59.2% of businesses with greater than 50% foreign ownership indicated that they undertook innovation.

2.1 LENGTH OF CURRENT BUSINESS OWNERSHIP, as at December 2003

	<i>Number of businesses at December 2003(a)</i>	<i>Proportion of total businesses at December 2003</i>	<i>Proportion of businesses innovating during 2001-2003</i>
	No.	%	%
Length of current ownership			
Less than 1 year	^ 11 137	^ 8.2	^ 23.2
1 to less than 4 years	23 086	17.0	^ 40.6
4 to less than 9 years	30 457	22.4	^ 32.2
9 years or more	71 156	52.4	35.9
Total	135 836	100.0	34.8

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

(a) See Explanatory Notes paragraphs 4–10 for the scope, coverage and definition of the business unit used in this survey.

2.2 BUSINESS OWNERSHIP, as at December 2003

	<i>Number of businesses at December 2003(a)</i>	<i>Proportion of total businesses at December 2003</i>	<i>Proportion of businesses innovating during 2001-2003</i>
	No.	%	%
Degree of ownership			
Wholly Australian owned	128 490	94.6	33.7
Foreign ownership			
Greater than 0% but less than or equal to 50%	^ 2 457	^ 1.8	^ 43.3
Greater than 50%	4 889	3.6	^ 59.2
Total	135 836	100.0	34.8

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

(a) See Explanatory Notes paragraphs 4–10 for the scope, coverage and definition of the business unit used in this survey.

INTRODUCTION

An understanding of barriers hampering innovation is seen as important for policy makers to effectively target resources and programs in order to overcome impediments.

All businesses were asked to indicate the factors that hampered them in developing or introducing new goods or services, or developing or implementing new processes. Businesses could select more than one factor for both new goods or services and for new processes respectively. A ranking of importance was not required.

BARRIERS TO INNOVATION

Innovating businesses were far more likely to report barriers to innovation than non-innovating businesses. Only 24.5% of businesses that introduced a new good or service or implemented a new process reported no barriers to innovation, while 52.6% of non-innovating businesses reported no barriers.

BARRIERS TO INNOVATION, 2001–2003(a), All businesses

	<i>Innovating businesses</i>	<i>Non-innovating businesses</i>
	%	%
Cost related barriers	62.3	34.2
Market related barriers	47.6	26.3
Lack of skilled staff	25.6	16.2
No barriers	24.5	52.6

.....
(a) Calendar years.

The most commonly reported factor hampering innovation for both innovating businesses and non-innovating businesses related to costs. Almost two thirds of innovating businesses (62.3%) and over one third of non-innovating businesses (34.2%) cited *Cost related barriers* as a factor hampering innovation. Of the cost related barriers, *Direct costs too high* at 36.2% and 19.3% respectively was the most significant.

Market related barriers were seen by 47.6% of innovating businesses and 26.3% of non-innovating businesses as hampering innovation. Within market related barriers, 30.1% of innovating businesses reported *Potential market already dominated by established businesses* as a barrier.

EMPLOYMENT SIZE

Compared to other characteristics of innovating businesses, there is not a pronounced correlation between the employment size of a business and its reported barriers to innovation. However factors which do appear to be influenced by employment size include *Lack of skilled staff* and *Cost or availability of finance*, which were reported as barriers by higher numbers of businesses with 5–19 and 20–99 persons employed than businesses with 100 or more persons employed.

STATE/TERRITORY

There was considerable variation in the perception of barriers at the state or territory level. Only 17.4% of innovating businesses in South Australia saw no barriers to innovation, compared to 31.2% in Western Australia. For non-innovators, the proportion of businesses reporting no barriers ranged from 49.1% in Queensland to 59% in the Australian Capital Territory.

INDUSTRY

At the industry level, the proportion of innovating businesses reporting no barriers was highest for the Mining industry (35.7%) while for non-innovating businesses the proportion reporting no barriers was highest for the Communications services industry (68.7%).

Factors hampering innovation which were reported by over 45% of innovating businesses in specific industries included: *Direct costs too high*, in the Accommodation, cafes and restaurants and Cultural and recreational services industries and *Potential market already dominated by established businesses* in the Wholesale trade industry.

3.1 BARRIERS TO INNOVATION, 2001–2003 (a), by employment size

	EMPLOYMENT SIZE			
	5–19	20–99	100 or more	Total
	persons	persons	persons	
	%	%	%	%
..... INNOVATING BUSINESSES (b)				
Barriers(c)				
Cost related				
Excessive economic risk perceived by the business	^ 23.7	^ 25.3	^ 28.2	24.4
Excessive economic risk perceived by financiers	^ 4.7	^ 11.5	^ 6.5	^ 6.7
Direct costs too high	33.6	40.6	43.7	36.2
Cost or availability of finance	^ 19.3	^ 20.0	^ 15.1	^ 19.2
Government regulations or standards	^ 25.8	^ 32.8	^ 31.6	28.1
Market related				
Potential market already dominated by established businesses	^ 29.1	^ 31.4	^ 34.9	30.1
Lack of customer demand for new goods or services	^ 17.2	^ 18.3	^ 23.1	17.9
Unable to appropriate benefits from intellectual property	^ 8.9	^ 7.2	^ 7.6	^ 8.4
Inability to secure strategic partnerships	^ 4.5	^ 7.9	^ 7.5	^ 5.6
Market too small or unknown	^ 11.5	^ 15.6	^ 13.7	^ 12.7
Lack of information on technology	*2.7	*3.0	*4.1	*2.9
Lack of skilled staff	^ 26.4	^ 25.2	^ 19.2	25.6
Other	^ 4.1	*6.0	^ 2.4	^ 4.5
No barriers	^ 25.6	^ 22.2	^ 23.4	24.5

..... NON-INNOVATING BUSINESSES (d)				
Barriers(c)				
Cost related				
Excessive economic risk perceived by the business	^ 8.3	^ 10.4	^ 8.1	^ 8.7
Excessive economic risk perceived by financiers	^ 4.1	*3.9	*1.9	^ 4.0
Direct costs too high	19.1	^ 20.6	^ 15.1	19.3
Cost or availability of finance	^ 9.9	^ 9.1	^ 6.2	^ 9.7
Government regulations or standards	^ 15.3	^ 17.4	^ 15.5	15.7
Market related				
Potential market already dominated by established businesses	13.7	^ 20.0	^ 11.8	14.8
Lack of customer demand for new goods or services	^ 12.1	^ 12.1	^ 8.0	^ 12.0
Unable to appropriate benefits from intellectual property	*2.8	*2.1	*1.5	^ 2.7
Inability to secure strategic partnerships	*2.5	**1.2	*1.5	*2.3
Market too small or unknown	^ 7.1	*5.2	^ 4.9	^ 6.7
Lack of information on technology	*1.8	*1.9	*1.6	*1.8
Lack of skilled staff	^ 16.3	^ 16.9	^ 6.1	16.2
Other	*2.6	*1.7	^ 0.6	^ 2.4
No barriers	53.0	49.3	63.4	52.6

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

(a) Calendar years.

(b) Proportions are of innovating businesses.

(c) Businesses could identify more than one barrier.

(d) Proportions are of non-innovating businesses.

3.2 BARRIERS TO INNOVATION, 2001–2003(a), by states and territories

STATE/TERRITORY	STATE/TERRITORY								
	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australian Capital Territory	Australia
	%	%	%	%	%	%	%	%	%
.....									
INNOVATING BUSINESSES (b)									
Barriers(c)									
Cost related									
Excessive economic risk perceived by the business	^ 24.0	^ 29.8	^ 21.2	^ 16.6	^ 26.0	*15.9	*32.1	* 18.9	24.4
Excessive economic risk perceived by financiers	*4.5	*6.9	*9.0	*8.8	*9.4	**4.6	**9.6	**4.6	^ 6.7
Direct costs too high	^ 37.1	^ 36.8	^ 37.7	^ 35.1	^ 29.6	*26.8	^ 41.8	*41.7	36.2
Cost or availability of finance	^ 13.2	^ 23.8	^ 25.8	^ 21.7	^ 19.9	*10.2	*18.1	*10.6	^ 19.2
Government regulations or standards	^ 33.7	^ 23.1	^ 29.7	^ 25.0	^ 20.3	*23.1	*24.8	*32.2	28.1
Market related									
Potential market already dominated by established businesses	^ 33.2	^ 31.5	^ 25.6	^ 29.4	^ 24.1	*13.9	^ 24.7	*37.2	30.1
Lack of customer demand for new goods or services	^ 20.1	^ 16.6	^ 14.1	^ 19.4	^ 17.0	**10.9	*15.2	*32.7	17.9
Unable to appropriate benefits from intellectual property	*7.1	*10.5	*10.3	*7.4	*7.8	**1.2	**1.9	**1.7	^ 8.4
Inability to secure strategic partnerships	*4.3	*7.0	*6.5	*2.3	*5.9	**13.5	*12.7	*15.1	^ 5.6
Market too small or unknown	*9.6	^ 12.3	^ 16.3	*12.2	^ 16.9	*25.0	*13.0	*26.6	^ 12.7
Lack of information on technology	*1.3	*5.9	*0.6	**4.5	**3.3	np	**7.6	**1.7	*2.9
Lack of skilled staff	^ 25.0	^ 24.8	^ 27.8	^ 30.3	^ 23.3	**18.9	^ 32.0	*23.2	25.6
Other	*5.6	*3.2	**4.1	**3.7	*4.1	**15.1	**2.8	**2.8	^ 4.5
No barriers	^ 22.0	^ 27.0	^ 26.3	^ 17.4	^ 31.2	*30.5	*30.3	**16.0	24.5

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

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

(a) Calendar years.

(b) Proportions are of innovating businesses.

(c) Businesses could identify more than one barrier.

3.2 BARRIERS TO INNOVATION, 2001–2003 (a), by states and territories *continued* . . .

	STATE/TERRITORY								
	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australian Capital Territory	Australia
	%	%	%	%	%	%	%	%	%
NON-INNOVATING BUSINESSES (b)									
Barriers(c)									
Cost related									
Excessive economic risk perceived by the business	^ 9.7	^ 10.3	^ 5.5	*10.4	*6.1	*12.5	*5.3	*5.1	^ 8.7
Excessive economic risk perceived by financiers	*3.7	*3.2	*5.6	*5.7	*3.7	**1.4	**1.3	**5.5	^ 4.0
Direct costs too high	^ 21.1	^ 20.1	^ 18.6	^ 18.2	^ 16.4	**9.2	*8.8	*18.8	19.3
Cost or availability of finance	*9.8	^ 8.4	^ 10.6	^ 13.0	*10.4	*2.7	*5.2	*9.7	^ 9.7
Government regulations or standards	^ 16.7	^ 15.5	^ 16.7	^ 15.9	^ 10.5	*15.4	*9.5	*21.1	15.7
Market related									
Potential market already dominated by established businesses	^ 15.4	^ 13.3	^ 13.4	^ 17.5	^ 17.3	*18.5	**4.2	*16.1	14.8
Lack of customer demand for new goods or services	^ 14.6	^ 12.6	*7.5	^ 12.8	*10.3	*12.6	**10.0	**7.4	^ 12.0
Unable to appropriate benefits from intellectual property	*3.5	*1.2	*3.5	**2.9	**1.1	**0.6	np	**10.8	^ 2.7
Inability to secure strategic partnerships	**2.9	**3.0	*1.5	np	**0.7	**2.4	**1.4	**3.7	*2.3
Market too small or unknown	*5.7	*10.1	*4.6	*7.5	*6.0	**10.0	*7.3	**0.9	^ 6.7
Lack of information on technology	**1.8	**2.2	**2.2	**0.8	**0.3	—	**2.2	**4.6	*1.8
Lack of skilled staff	^ 15.2	^ 12.0	^ 23.9	^ 14.2	^ 14.9	*17.5	*33.5	*13.4	16.2
Other	**2.6	*1.6	*2.7	**2.6	*3.6	**5.5	np	np	^ 2.4
No barriers	49.7	57.2	49.1	57.4	53.6	^ 55.2	^ 50.4	^ 59.0	52.6

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

— nil or rounded to zero (including null cells)

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

(a) Calendar years.

(b) Proportions are of non-innovating businesses.

(c) Businesses could identify more than one barrier.

3.3 BARRIERS TO INNOVATION, 2001–2003(a), by industry

	INDUSTRY				
	Mining	Manufacturing	Electricity, gas and water supply	Construction	Wholesale trade
	%	%	%	%	%
.....					
INNOVATING BUSINESSES (b)					
Barriers(c)					
Cost related					
Excessive economic risk perceived by the business	^ 29.5	29.1	30.6	*14.2	^ 34.9
Excessive economic risk perceived by financiers	*10.9	^ 9.4	13.0	**2.0	*9.3
Direct costs too high	^ 28.1	42.5	33.6	^ 30.5	^ 34.3
Cost or availability of finance	*14.5	18.6	11.7	*7.4	^ 33.3
Government regulations or standards	*14.7	27.4	33.7	*16.1	^ 31.8
Market related					
Potential market already dominated by established businesses	*11.6	27.8	21.3	*16.4	^ 46.4
Lack of customer demand for new goods or services	*7.7	19.7	^ 16.1	*10.7	^ 25.0
Unable to appropriate benefits from intellectual property	**3.0	^ 11.2	5.6	**2.0	*17.0
Inability to secure strategic partnerships	**3.3	^ 6.2	4.9	**2.7	*8.9
Market too small or unknown	**5.3	^ 17.2	12.3	**1.4	^ 19.1
Lack of information on technology	**2.2	^ 4.3	^ 11.1	**3.3	**3.1
Lack of skilled staff	**6.4	27.3	^ 21.0	^ 26.6	^ 23.2
Other	*10.9	^ 4.5	5.3	**2.5	**2.7
No barriers	^ 35.7	22.8	19.4	^ 33.0	^ 21.0

.....

NON-INNOVATING BUSINESSES (d)

Barriers(c)					
Cost related					
Excessive economic risk perceived by the business	*14.9	16.0	*12.4	*8.1	*11.9
Excessive economic risk perceived by financiers	*10.5	^ 3.4	np	*4.7	*3.7
Direct costs too high	^ 22.1	27.1	^ 16.1	9.8	^ 13.5
Cost or availability of finance	*18.9	^ 12.4	*3.3	*7.0	*9.8
Government regulations or standards	^ 19.4	18.4	*12.6	*11.0	*13.0
Market related					
Potential market already dominated by established businesses	*15.1	16.8	*4.8	*9.2	^ 22.5
Lack of customer demand for new goods or services	^ 14.2	^ 11.0	^ 6.4	*6.6	*14.1
Unable to appropriate benefits from intellectual property	np	^ 5.8	np	**1.1	**4.3
Inability to secure strategic partnerships	*8.7	*2.3	np	**1.9	**2.9
Market too small or unknown	*11.1	^ 8.0	np	**1.3	*7.0
Lack of information on technology	np	^ 2.6	—	**1.1	**1.5
Lack of skilled staff	*8.9	^ 18.2	**4.6	^ 17.2	^ 23.1
Other	**2.3	^ 3.7	**4.5	**1.9	**2.4
No barriers	^ 54.2	44.7	66.7	61.3	^ 45.0

-
- ^ estimate has a relative standard error of 10% to less than 25% and should be used with caution
- * estimate has a relative standard error of 25% to 50% and should be used with caution
- ** estimate has a relative standard error greater than 50% and is considered too unreliable for general use
- nil or rounded to zero (including null cells)
- np not available for publication but included in totals where applicable, unless otherwise indicated
- (a) Calendar years.
- (b) Proportions are of innovating businesses.
- (c) Businesses could identify more than one barrier.
- (d) Proportions are of non-innovating businesses.
-

3.3 BARRIERS TO INNOVATION, 2001–2003(a), by industry *continued*

INDUSTRY *continued*

	Retail trade	Accommodation, cafes and restaurants	Transport and storage	Communications services
	%	%	%	%
.....				
INNOVATING BUSINESSES (b)				
Barriers(c)				
Cost related				
Excessive economic risk perceived by the business	*27.5	*20.2	*19.1	^ 31.7
Excessive economic risk perceived by financiers	*4.4	**10.1	*9.3	*9.8
Direct costs too high	^ 38.6	^ 48.8	^ 44.3	^ 35.1
Cost or availability of finance	*20.6	*18.2	*20.4	^ 24.1
Government regulations or standards	*25.5	^ 41.0	*24.3	^ 27.3
Market related				
Potential market already dominated by established businesses	^ 36.9	*38.4	^ 33.1	^ 32.2
Lack of customer demand for new goods or services	*12.1	*23.8	*13.2	*19.2
Unable to appropriate benefits from intellectual property	**3.4	*14.0	**2.4	*7.5
Inability to secure strategic partnerships	**0.3	**9.2	**6.7	**7.9
Market too small or unknown	*11.7	*22.8	*6.1	*18.2
Lack of information on technology	**1.0	**4.4	**1.0	*8.2
Lack of skilled staff	*25.2	*31.7	^ 27.7	*14.3
Other	**1.5	**9.1	**3.3	*2.7
No barriers	*21.5	*18.1	^ 27.9	^ 23.9

NON-INNOVATING BUSINESSES (d)

Barriers(c)				
Cost related				
Excessive economic risk perceived by the business	**5.9	*12.7	*14.3	*1.5
Excessive economic risk perceived by financiers	*7.0	**3.0	*8.1	*2.5
Direct costs too high	^ 17.1	^ 26.8	^ 26.4	^ 18.1
Cost or availability of finance	*12.4	*10.9	*9.9	*6.1
Government regulations or standards	*14.0	^ 20.3	^ 27.2	*11.0
Market related				
Potential market already dominated by established businesses	*15.3	^ 16.9	^ 18.8	*14.6
Lack of customer demand for new goods or services	*15.6	*12.4	*7.4	*3.1
Unable to appropriate benefits from intellectual property	**3.7	—	**2.1	np
Inability to secure strategic partnerships	**3.4	—	**1.5	*3.6
Market too small or unknown	**4.4	*16.1	**5.1	*2.5
Lack of information on technology	**3.1	np	—	np
Lack of skilled staff	^ 16.4	*12.6	*7.8	*9.0
Other	**2.6	**1.3	**2.7	—
No barriers	51.2	^ 43.7	^ 51.1	68.7

- ^ estimate has a relative standard error of 10% to less than 25% and should be used with caution
- * estimate has a relative standard error of 25% to 50% and should be used with caution
- ** estimate has a relative standard error greater than 50% and is considered too unreliable for general use
- nil or rounded to zero (including null cells)
- np not available for publication but included in totals where applicable, unless otherwise indicated
- (a) Calendar years.
- (b) Proportions are of innovating businesses.
- (c) Businesses could identify more than one barrier.
- (d) Proportions are of non-innovating businesses.

3.3**BARRIERS TO INNOVATION, 2001–2003(a), by industry *continued****INDUSTRY continued*

	<i>Finance and insurance</i>	<i>Personal and business services</i>	<i>Cultural and recreational services</i>	<i>Total</i>
	%	%	%	%

.....
INNOVATING BUSINESSES (b)

Barriers(c)

Cost related

Excessive economic risk perceived by the business	^ 29.0	*15.3	^ 37.2	24.4
Excessive economic risk perceived by financiers	*7.0	*5.4	*5.0	^ 6.7
Direct costs too high	*26.8	^ 27.2	^ 47.3	36.2
Cost or availability of finance	*11.3	^ 16.1	^ 23.8	^ 19.2
Government regulations or standards	^ 45.4	^ 28.3	^ 24.1	28.1

Market related

Potential market already dominated by established businesses	^ 32.0	^ 20.9	^ 21.7	30.1
Lack of customer demand for new goods or services	*15.4	^ 17.9	^ 32.4	17.9
Unable to appropriate benefits from intellectual property	**2.9	*7.9	*12.4	^ 8.4
Inability to secure strategic partnerships	*13.7	*5.2	*15.8	^ 5.6
Market too small or unknown	*3.0	*8.6	^ 26.0	^ 12.7
Lack of information on technology	**2.5	**2.5	*4.4	*2.9

Lack of skilled staff

Lack of skilled staff	*20.8	^ 25.6	^ 20.4	25.6
-----------------------	-------	--------	--------	------

Other	*2.0	*7.4	**7.9	^ 4.5
-------	------	------	-------	-------

No barriers	*23.7	^ 30.7	*10.7	24.5
-------------	-------	--------	-------	------

.....
NON-INNOVATING BUSINESSES (d)

Barriers(c)

Cost related

Excessive economic risk perceived by the business	**3.4	*5.2	*9.0	^ 8.7
Excessive economic risk perceived by financiers	**0.7	*1.4	*4.5	^ 4.0
Direct costs too high	*16.9	^ 19.5	^ 20.5	19.3
Cost or availability of finance	*8.3	*6.9	*6.2	^ 9.7
Government regulations or standards	*27.0	^ 13.7	^ 21.3	15.7

Market related

Potential market already dominated by established businesses	*8.3	^ 11.8	^ 17.6	14.8
Lack of customer demand for new goods or services	**3.0	*11.3	*16.9	^ 12.0
Unable to appropriate benefits from intellectual property	**2.6	*1.7	**2.5	^ 2.7
Inability to secure strategic partnerships	**2.1	**1.8	**4.9	*2.3
Market too small or unknown	**6.2	*6.1	*13.1	^ 6.7
Lack of information on technology	**3.5	**1.6	**0.4	*1.8

Lack of skilled staff

Lack of skilled staff	*17.1	^ 16.1	*8.3	16.2
-----------------------	-------	--------	------	------

Other	**2.6	*2.6	**0.3	^ 2.4
-------	-------	------	-------	-------

No barriers	^ 63.1	59.2	^ 49.2	52.6
-------------	--------	------	--------	------

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

(a) Calendar years.

(b) Proportions are of innovating businesses.

(c) Businesses could identify more than one barrier.

(d) Proportions are of non-innovating businesses.

CHAPTER 4

DRIVERS OF INNOVATION

INTRODUCTION

The key drivers of innovation represent the underlying reasons why businesses may initiate a program of innovation. Together with barriers to innovation, they represent part of a continuum of environmental factors that influence the conduct of innovation within a business.

Innovating businesses were asked to indicate the key reasons that drive innovation. Businesses could select more than one driver for both new goods and services and new processes respectively. A ranking of importance was not required.

In general, for each driver the proportion of businesses reporting that as a main driver increased with the size of the business, for both new goods and services, and new processes. There was much wider variation in the reporting of drivers at the state and industry level.

DRIVERS OF INNOVATION, 2001–2003 (a), Innovating businesses

	%
Drivers relating to the development of new goods or services	
Profit related drivers	71.4
Market related drivers	70.5
Legal related drivers	42.0
Drivers relating to the implementation of new processes^(b)	
Profit related drivers	71.5
Market related drivers	59.5
Legal related drivers	55.8

(a) Calendar years.

(b) Processes includes operational and organisational/managerial processes.

NEW GOODS AND SERVICES

Profit related drivers to develop new goods or services were reported by 71.4% of innovating businesses. The profit related driver most frequently reported across all employment size ranges, most states and territories and most industries was *Increase revenue* (61%). Proportions of businesses reporting *Increase revenue* as a driver ranged from 82.4% in the Wholesale trade industry to 40.8% for both the Mining and Construction industries. A high proportion of innovating businesses also reported *Market related* drivers (70.5%). The market related driver *Increase responsiveness to customer needs* was the second most often reported driver at the Australian level (48.2%). It was the most common individual driver in Tasmania and the Northern Territory and the second most commonly selected in 6 out of 12 industries.

NEW PROCESSES

As with the reasons businesses developed new goods or services, those developing new operational or organisational/managerial processes cited *Profit related* drivers most often (71.5%). Within profit related drivers, *Reduce costs* (58.1%) and *Improve productivity* (57.5%) were highest. This was consistent across employment size ranges

NEW PROCESSES
continued

and most states and territories, but legal related drivers such as *Improve safety or working conditions* and *Meet government regulations and standards* were also frequently selected in the Electricity, gas and water supply; Construction; Retail trade and Accommodation, cafes and restaurants industries.

4.1 DRIVERS OF INNOVATION, 2001–2003(a)(b), Innovating businesses, by employment size

	EMPLOYMENT SIZE(c)			
	5–19 persons	20–99 persons	100 or more persons	Total
	%	%	%	%
DRIVERS RELATING TO NEW GOODS OR SERVICES (d)				
Profit related				
Improve productivity	39.4	46.0	46.5	41.7
Increase revenue	59.3	62.0	73.8	61.0
Reduce costs	38.2	41.9	43.7	39.6
Market related				
Be at the cutting edge of the industry	35.5	40.5	48.7	37.8
Increase responsiveness to customer needs	43.1	57.9	59.0	48.2
Increase market share	39.9	52.8	65.5	45.2
Establish a new market	30.5	39.1	41.7	33.6
Exploit new ways to manage this business's supply chain	^ 11.8	^ 16.6	^ 27.6	^ 14.2
Increase export opportunities	^ 9.6	^ 14.5	^ 19.9	^ 11.7
High degree of price competition in this business's product markets	26.1	^ 27.4	40.0	27.4
Legal related				
Be environmentally responsible	^ 23.8	^ 30.0	^ 31.7	26.0
Improve safety or working conditions	^ 28.4	35.9	^ 35.3	30.9
Meet government regulations or standards	32.3	35.5	37.9	33.6
Other	*0.8	*0.8	**2.1	*0.9
DRIVERS RELATING TO NEW PROCESSES (d)(e)				
Profit related				
Improve productivity	53.6	62.4	75.1	57.5
Increase revenue	38.3	59.0	55.3	45.2
Reduce costs	52.6	67.7	73.5	58.1
Market related				
Be at the cutting edge of the industry	^ 23.5	^ 30.8	40.3	26.7
Increase responsiveness to customer needs	41.3	56.8	61.4	46.9
Increase market share	^ 22.2	^ 39.0	40.0	28.1
Establish a new market	^ 11.0	^ 19.5	^ 19.9	^ 14.0
Exploit new ways to manage this business's supply chain	^ 12.9	^ 20.0	37.0	16.5
Increase export opportunities	*3.4	^ 7.5	^ 13.1	^ 5.2
High degree of price competition in this business's product markets	^ 16.8	^ 25.4	^ 34.3	20.4
Legal related				
Be environmentally responsible	32.3	^ 33.8	41.4	33.3
Improve safety or working conditions	42.9	51.7	60.7	46.5
Meet government regulations or standards	43.6	48.1	57.9	45.8
Other	*0.9	**1.4	**1.3	*1.1

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

(a) Calendar years.

(b) Includes drivers to the development and introduction of new or significantly improved goods or services or the development and implementation of new or significantly improved operational or organisational/managerial processes.

(c) Proportions are of businesses reporting innovation in each employment category.

(d) Businesses could identify more than one driver.

(e) Processes includes operational or organisational/managerial processes.

4.2 DRIVERS OF INNOVATION 2001–2003(a)(b), Innovating businesses, by states and territories

STATE/TERRITORY(c)

	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australian Capital Territory	Australia
	%	%	%	%	%	%	%	%	%
DRIVERS RELATING TO NEW GOODS AND SERVICES (d)									
Profit related									
Improve productivity	^ 41.1	^ 41.7	^ 42.2	^ 34.5	^ 50.1	*41.2	^ 41.1	*39.6	41.7
Increase revenue	58.0	65.8	62.5	53.8	64.7	^ 50.3	^ 55.6	^ 70.8	61.0
Reduce costs	^ 41.4	^ 40.3	^ 32.7	^ 36.4	^ 43.5	*43.7	^ 37.5	*46.8	39.6
Market related									
Be at the cutting edge of the industry	^ 38.4	^ 37.3	^ 36.5	^ 41.1	^ 38.1	*23.3	^ 39.4	*37.5	37.8
Increase responsiveness to customer needs	45.3	^ 45.1	^ 51.9	^ 47.3	59.4	^ 56.5	^ 65.4	^ 54.7	48.2
Increase market share	^ 43.1	^ 48.3	^ 47.2	^ 45.5	^ 41.4	*25.8	^ 52.7	^ 58.9	45.2
Establish a new market	^ 30.0	^ 39.3	^ 35.6	^ 34.5	^ 27.6	*32.5	^ 40.3	*34.6	33.6
Exploit new ways to manage this business's supply chain	^ 14.1	^ 13.0	^ 17.5	*15.1	*10.4	*12.4	*14.6	**21.8	^ 14.2
Increase export opportunities	^ 12.6	^ 15.1	^ 6.7	*12.3	*7.3	*7.5	*15.5	*9.4	^ 11.7
High degree of price competition in this business's product markets	^ 28.4	^ 28.5	^ 25.0	^ 30.7	^ 25.8	*15.8	*27.1	*11.0	27.4
Legal related									
Be environmentally responsible	^ 31.7	^ 21.3	^ 22.0	^ 26.7	^ 23.6	*19.5	^ 39.3	**19.8	26.0
Improve safety or working conditions	^ 35.3	^ 32.4	^ 21.9	^ 29.9	^ 27.5	*22.9	^ 43.4	**19.9	30.9
Meet government regulations or standards	^ 38.4	^ 30.3	^ 27.9	^ 36.6	^ 31.8	*26.8	^ 44.4	*25.8	33.6
Other	0.9	**0.3	**1.2	np	**1.4	**0.8	np	**9.9	*0.9

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

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

(a) Calendar years.

(b) Includes drivers to the development and introduction of new or significantly improved goods or services or the development and implementation of new or significantly improved operational or organisational/managerial processes.

(c) Proportions are of businesses reporting innovation in each state/territory.

(d) Businesses could identify more than one driver.

4.2 DRIVERS OF INNOVATION 2001–2003(a)(b), Innovating businesses, by states and territories *continued*

	STATE/TERRITORY(c)								
	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australian Capital Territory	Australia
	%	%	%	%	%	%	%	%	%
DRIVERS RELATING TO NEW PROCESSES (d)(e)									
Profit related									
Improve productivity	55.1	^ 48.3	74.6	55.8	62.4	^ 55.0	^ 52.7	^ 73.3	57.5
Increase revenue	^ 44.3	^ 40.2	56.3	^ 43.6	^ 44.4	^ 51.2	^ 47.2	* 40.3	45.2
Reduce costs	57.0	54.1	67.7	58.3	^ 52.4	77.7	^ 58.5	^ 72.3	58.1
Market related									
Be at the cutting edge of the industry	^ 25.9	^ 25.5	^ 32.3	^ 25.9	^ 26.1	* 14.1	* 26.5	* 26.4	26.7
Increase responsiveness to customer needs	^ 47.7	^ 37.2	56.5	^ 48.5	^ 48.1	^ 67.0	^ 40.6	^ 59.0	46.9
Increase market share	^ 26.7	^ 28.1	^ 28.3	^ 33.6	^ 26.9	* 38.9	* 24.6	* 24.1	28.1
Establish a new market	^ 14.0	^ 13.3	^ 15.1	^ 16.3	* 11.3	* 18.2	* 20.4	* 10.1	^ 14.0
Exploit new ways to manage this business's supply chain	^ 15.2	^ 14.7	^ 22.1	^ 20.8	* 11.5	* 14.6	* 23.4	* 24.0	16.5
Increase export opportunities	* 5.6	^ 5.1	* 4.1	* 4.6	* 5.6	** 4.6	* 15.8	** 2.8	^ 5.2
High degree of price competition in this business's product markets	^ 20.6	^ 16.0	^ 24.4	^ 20.0	^ 24.4	* 19.1	* 17.7	* 26.0	20.4
Legal related									
Be environmentally responsible	^ 38.3	^ 31.4	^ 33.0	^ 33.9	^ 23.0	* 21.5	* 31.6	* 18.4	33.3
Improve safety or working conditions	51.2	^ 44.1	^ 41.3	^ 46.4	^ 44.3	^ 57.0	^ 56.0	* 28.7	46.5
Meet government regulations or standards	50.9	^ 40.0	^ 45.5	^ 47.0	^ 38.5	^ 48.5	^ 52.5	^ 56.3	45.8
Other	** 1.1	** 0.2	** 1.9	** 1.7	** 1.1	** 0.7	* 0.7	** 3.4	* 1.1

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

(a) Calendar years.

(b) Includes drivers to the development and introduction of new or significantly improved goods or services or the development and implementation of new or significantly improved operational or organisational/managerial processes.

(c) Proportions are of businesses reporting innovation in each state/territory.

(d) Businesses could identify more than one driver.

(e) Processes includes operational or organisational/managerial processes.

4.3 DRIVERS OF INNOVATION, 2001–2003(a)(b), Innovating businesses, by industry

	INDUSTRY(c)						
	Mining	Manufacturing	Electricity, gas and water supply	Construction	Wholesale trade	Retail trade	Accommodation, cafes and restaurants
	%	%	%	%	%	%	%
DRIVERS RELATING TO NEW GOODS AND SERVICES (d)							
Profit related							
Improve productivity	^ 29.5	44.2	41.3	^ 42.8	^ 40.8	^ 39.6	^ 46.3
Increase revenue	^ 40.8	65.1	52.3	^ 40.8	82.4	^ 59.1	^ 68.8
Reduce costs	^ 30.8	41.5	41.5	^ 29.2	^ 39.7	^ 48.8	^ 66.6
Market related							
Be at the cutting edge of the industry	^ 26.6	40.6	37.3	^ 27.3	^ 41.6	*29.6	^ 47.0
Increase responsiveness to customer needs	^ 29.9	53.2	50.8	^ 39.1	^ 51.4	^ 34.8	^ 57.7
Increase market share	^ 36.8	52.7	38.3	*25.5	74.3	^ 39.9	^ 53.6
Establish a new market	^ 23.4	43.9	31.7	*15.2	58.4	*21.0	^ 44.5
Exploit new ways to manage this business's supply chain	^ 5.9	^ 17.4	17.2	*10.5	^ 26.0	*13.0	*23.7
Increase export opportunities	*18.7	24.1	^ 9.0	**1.3	^ 17.9	*6.3	**0.3
High degree of price competition in this business's product markets	*10.0	35.2	20.4	*19.7	^ 45.5	^ 31.9	*34.7
Legal related							
Be environmentally responsible	^ 29.1	30.0	43.0	^ 31.6	^ 25.6	^ 36.7	*31.8
Improve safety or working conditions	^ 30.4	35.7	41.2	^ 28.5	^ 31.4	^ 41.4	^ 40.5
Meet government regulations or standards	^ 18.5	33.3	41.9	^ 27.2	^ 36.0	^ 42.3	^ 46.4
Other	**4.2	**1.0	3.4	**2.7	np	**0.7	np

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

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

(a) Calendar years.

(b) Includes drivers to the development and introduction of new or significantly improved goods or services or the development and implementation of new or significantly improved operational or organisational/managerial processes.

(c) Proportions are of businesses reporting innovation in each industry.

(d) Businesses could identify more than one driver.

4.3 DRIVERS OF INNOVATION, 2001–2003(a)(b), Innovating businesses, by industry

continued

	INDUSTRY(c)						
	Mining	Manufacturing	Electricity, gas and water supply	Construction	Wholesale trade	Retail trade	Accommodation, cafes and restaurants
	%	%	%	%	%	%	%
DRIVERS RELATING TO NEW PROCESSES (d)(e)							
Profit related							
Improve productivity	70.1	64.5	71.6	^ 51.6	61.3	^ 43.3	^ 52.1
Increase revenue	64.0	42.6	55.5	^ 42.1	^ 44.0	^ 34.2	^ 50.5
Reduce costs	80.8	63.8	79.7	^ 52.1	63.4	^ 47.4	^ 59.7
Market related							
Be at the cutting edge of the industry	^ 27.2	27.4	35.5	*28.5	^ 18.6	*18.4	*24.2
Increase responsiveness to customer needs	^ 33.9	45.4	56.6	^ 41.3	^ 40.8	^ 35.7	^ 49.7
Increase market share	^ 36.8	30.0	28.3	^ 19.2	^ 29.9	*19.9	*31.0
Establish a new market	*15.3	17.5	18.5	*7.2	*16.4	*6.3	*17.6
Exploit new ways to manage this business's supply chain	^ 18.3	20.9	25.6	*9.3	^ 29.3	*14.3	*22.1
Increase export opportunities	*17.5	^ 11.9	5.0	**1.3	*8.5	np	**0.3
High degree of price competition in this business's product markets	*21.5	29.2	27.8	*19.6	^ 18.3	*17.9	*31.1
Legal related							
Be environmentally responsible	61.3	38.0	65.3	*31.3	^ 26.0	^ 42.7	^ 40.3
Improve safety or working conditions	68.7	53.0	70.1	^ 59.0	^ 52.1	^ 49.1	^ 49.5
Meet government regulations or standards	^ 52.4	43.8	76.8	^ 46.4	^ 48.3	^ 47.1	^ 57.0
Other	**4.6	*1.3	5.0	**2.0	np	**0.7	**2.3

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

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

(a) Calendar years.

(b) Includes drivers to the development and introduction of new or significantly improved goods or services or the development and implementation of new or significantly improved operational or organisational/managerial processes.

(c) Proportions are of businesses reporting innovation in each industry.

(d) Businesses could identify more than one driver.

(e) Processes includes operational or organisational/managerial processes.

4.3 DRIVERS OF INNOVATION, 2001–2003(a)(b), Innovating businesses, by industry

continued

INDUSTRY(c) *continued*

	<i>Transport and storage</i>	<i>Communication services</i>	<i>Finance and insurance</i>	<i>Property and business services</i>	<i>Cultural and recreational services</i>	<i>Total</i>
	%	%	%	%	%	%
DRIVERS RELATING TO NEW GOODS AND SERVICES (d)						
Profit related						
Improve productivity	^ 43.4	^ 41.3	^ 36.6	^ 43.0	^ 28.6	41.7
Increase revenue	^ 49.0	67.5	^ 59.3	^ 55.0	67.1	61.0
Reduce costs	^ 34.1	^ 40.7	^ 35.0	^ 28.1	^ 35.8	39.6
Market related						
Be at the cutting edge of the industry	^ 28.8	^ 50.1	^ 36.8	^ 43.4	^ 37.4	37.8
Increase responsiveness to customer needs	^ 44.8	^ 55.2	^ 52.3	^ 52.9	^ 61.5	48.2
Increase market share	^ 28.0	61.4	^ 44.6	^ 36.0	^ 44.5	45.2
Establish a new market	^ 22.5	^ 45.3	^ 31.7	^ 29.6	^ 30.4	33.6
Exploit new ways to manage this business's supply chain	*8.0	^ 11.4	*12.8	**6.8	*11.9	^ 14.2
Increase export opportunities	*4.7	*17.8	**7.4	*10.7	*18.9	^ 11.7
High degree of price competition in this business's product markets	^ 30.6	^ 36.8	*19.0	^ 11.0	^ 16.8	27.4
Legal related						
Be environmentally responsible	^ 26.5	*11.2	*14.6	*14.0	*12.0	26.0
Improve safety or working conditions	^ 29.4	^ 18.8	*13.8	*21.8	*10.5	30.9
Meet government regulations or standards	^ 34.1	^ 26.2	^ 25.8	^ 27.4	*17.3	33.6
Other	np	np	**5.6	np	**3.0	*0.9

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

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

(a) Calendar years.

(b) Includes drivers to the development and introduction of new or significantly improved goods or services or the development and implementation of new or significantly improved operational or organisational/managerial processes.

(c) Proportions are of businesses reporting innovation in each industry.

(d) Businesses could identify more than one driver.

4.3 DRIVERS OF INNOVATION, 2001–2003(a)(b), Innovating businesses, by industry

continued

INDUSTRY(c) *continued*

	<i>Transport and storage</i>	<i>Communication services</i>	<i>Finance and insurance</i>	<i>Property and business services</i>	<i>Cultural and recreational services</i>	<i>Total</i>
	%	%	%	%	%	%
DRIVERS RELATING TO NEW PROCESSES (d)(e)						
Profit related						
Improve productivity	^ 52.4	65.7	^ 58.3	66.9	^ 51.8	57.5
Increase revenue	^ 50.2	^ 55.7	^ 46.1	^ 55.4	^ 45.2	45.2
Reduce costs	^ 66.1	68.1	^ 59.7	60.0	^ 55.0	58.1
Market related						
Be at the cutting edge of the industry	*19.7	^ 35.0	^ 25.1	^ 36.5	^ 41.0	26.7
Increase responsiveness to customer needs	^ 41.1	59.6	^ 53.7	61.7	^ 49.0	46.9
Increase market share	^ 14.8	^ 41.4	^ 26.7	^ 34.9	^ 41.1	28.1
Establish a new market	*8.1	*17.4	*8.2	*18.3	*22.0	^ 14.0
Exploit new ways to manage this business's supply chain	*14.3	^ 14.9	*17.4	*9.5	*15.3	16.5
Increase export opportunities	*4.8	*10.2	**1.6	**5.0	*9.2	^ 5.2
High degree of price competition in this business's product markets	*13.9	^ 24.8	*19.8	*14.8	*18.8	20.4
Legal related						
Be environmentally responsible	^ 35.0	*15.5	*15.2	^ 28.0	*20.3	33.3
Improve safety or working conditions	^ 50.6	^ 26.3	^ 21.2	^ 35.0	^ 40.0	46.5
Meet government regulations or standards	^ 43.0	^ 39.4	^ 53.1	^ 41.5	^ 39.8	45.8
Other	np	np	**7.9	np	**2.0	*1.1

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

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

(a) Calendar years.

(b) Includes drivers to the development and introduction of new or significantly improved goods or services or the development and implementation of new or significantly improved operational or organisational/managerial processes.

(c) Proportions are of businesses reporting innovation in each industry.

(d) Businesses could identify more than one driver.

(e) Processes includes operational or organisational/managerial processes.

INTRODUCTION

Measuring collaboration provides insight into the linkages between innovating businesses and other organisations. Linkages are important in understanding the business dynamic in initiating pooled undertakings of innovation.

Innovating businesses were asked to indicate the types of collaboration (which involved some sharing of technical or commercial risk) they were actively involved in to develop and introduce new goods or services or develop or implement new processes during the calendar year 2003. Businesses could select more than one type of collaboration. They were also asked to indicate the type of organisation with which they collaborated, and the location of that organisation. Businesses could select more than one type of organisation and location. A ranking of importance was not required.

TYPE OF COLLABORATION

During the calendar year 2003, 27% of innovating businesses were involved in some form of active collaboration to develop new goods or services or to develop or implement new processes. The most frequently reported types of collaboration were *Joint marketing or distribution* and *Other joint ventures*, which were each reported by approximately 15% of innovating businesses. Businesses with 100 or more employees were more likely to engage in collaborations, but types of collaboration varied according to employment size. More businesses which employed 5–19 persons indicated they entered into *Joint arrangements for marketing or distribution*, while businesses with 100 or more persons employed were more likely to engage in *Joint research and development* and *Licensing agreements*.

Nearly half the innovating businesses in the Cultural and recreation services industry reported engaging in some form of collaboration. The incidence was also over 40% for innovating businesses in the Electricity, gas and water supply industry. Collaboration occurred least often in the Retail trade industry, with only 17.2% of innovating businesses reporting collaborations.

TYPE OF COLLABORATION COLLABORATION DURING 2003 (a), Innovating businesses(b)

continued

	%
Type of collaboration	
Some collaboration	27.0
No form or collaboration/alliance	73.0
Types of organisations collaborated with	
Other parts of a wider enterprise group to which this business belongs	^ 12.5
Suppliers, clients, competitors and consultants	25.1
Universities, government and research institutions	^ 6.5
Other types of organisations	*1.3

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Calendar year.

(b) Businesses could identify more than one type of collaboration.

TYPES OF ORGANISATIONS COLLABORATED WITH

The major types of organisations with which collaboration occurred were suppliers, clients, competitors and consultants at 25.1%. Within this group, collaboration most often occurred with *Suppliers of equipment, materials, components or software* (16.2%), *Clients or customers* (15.2%) and *Other parts of a wider enterprise group to which the business belongs* (12.5%). The proportions of innovating businesses reporting collaboration with *Universities, government and research institutions* was 6.5%. Within this group, the most significant collaborations were with *Government agencies* (3.8%), followed by *Universities or other higher education institutions* (2.7%).

LOCATION OF ORGANISATIONS COLLABORATED WITH

Businesses involved in collaborative arrangements were more likely to link with *Businesses from within 100km* than *From elsewhere in Australia* or *From overseas*. This finding was consistent across all types of businesses with collaborative arrangements.

5.1 COLLABORATION DURING 2003 (a), Innovating businesses, by employment size ..

EMPLOYMENT SIZE (b)

	5-19 persons	20-99 persons	100 or more persons	Total
	%	%	%	%
Type of collaboration (c)				
Joint marketing or distribution	^ 16.2	^ 12.7	^ 14.9	^ 15.1
Joint manufacturing	* 5.9	* 4.7	^ 5.2	^ 5.5
Joint research and development	* 5.9	^ 7.0	^ 15.2	^ 6.9
Other joint venture	^ 12.8	^ 17.9	^ 24.4	^ 15.0
Licensing agreement	^ 10.4	^ 14.1	^ 19.5	^ 12.1
Other form of collaboration/alliance	* 3.6	* 3.4	^ 4.7	* 3.7
No form of collaboration/alliance	75.7	69.3	61.7	73.0

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Calendar year.

(b) Proportions are of businesses reporting innovation in each employment size category.

(c) Businesses could identify more than one type of collaboration.

5.2 COLLABORATION DURING 2003(a), Innovating businesses, by industry

TYPE OF COLLABORATION(b)

Industry(c)	Joint marketing or distribution	Joint manufacturing	Joint research and development	Other joint venture	Licensing agreement	Other form of collaboration /alliance	No form of collaboration /alliance
	%	%	%	%	%	%	%
Mining	*6.5	*4.8	*10.8	*21.0	*6.5	**6.0	74.1
Manufacturing	^ 12.7	^ 12.3	^ 10.8	^ 15.8	^ 10.7	^ 2.3	72.0
Electricity, gas and water supply	10.3	np	16.4	29.9	^ 13.6	9.1	57.9
Construction	*15.4	**2.2	**3.4	*11.2	**4.5	np	79.1
Wholesale trade	*14.6	**5.5	*8.2	^ 19.0	*13.0	**4.9	67.4
Retail trade	*13.8	**3.4	**1.4	*4.6	*5.4	**1.3	82.8
Accommodation, cafes and restaurants	*21.0	**1.6	**1.6	*11.1	**4.4	**4.1	^ 75.8
Transport and storage	*10.3	*0.4	*1.6	*12.2	*5.0	*8.6	78.0
Communication services	^ 24.0	*2.8	*15.3	^ 21.1	*15.7	*2.1	66.5
Finance and insurance	*12.5	**2.4	**7.7	*14.1	*18.7	**4.3	67.0
Property and business services	*15.9	**5.9	**10.1	*21.2	*21.6	**5.5	68.9
Cultural and recreational services	^ 29.0	*4.1	*12.4	^ 33.6	^ 24.1	*9.4	^ 50.5
Total	^ 15.1	^ 5.5	^ 6.9	^ 15.0	^ 12.1	*3.7	73.0

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

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

(a) Calendar year.

(b) Businesses could identify more than one type of collaboration.

(c) Proportions are of businesses reporting innovation in each industry.

5.3 COLLABORATION DURING 2003(a), Innovating businesses, by type and location of business with which collaboration occurred

LOCATION(b)(c)

	LOCATION(b)(c)				
	<i>From within 100km</i>	<i>From elsewhere in same State or Territory</i>	<i>From elsewhere in Australia</i>	<i>From overseas</i>	<i>From any location</i>
	%	%	%	%	%
Types of business collaborated with(d)					
Other parts of a wider enterprise group to which the business belongs	^ 6.0	*3.3	^ 5.0	*2.7	^ 12.5
Market					
Clients or customers	^ 9.2	^ 5.1	^ 6.7	*3.0	^ 15.2
Suppliers of equipment, materials, components or software	^ 8.6	*4.1	^ 6.3	^ 2.8	^ 16.2
Consultants	^ 6.1	^ 2.1	^ 1.5	*0.6	^ 9.1
Competitors and other businesses from the same industry	^ 4.2	^ 2.0	*2.6	*0.9	^ 7.9
Institutional					
Universities or other higher education institutions	^ 1.9	*0.7	^ 0.8	*0.2	^ 2.7
Government agencies	^ 1.9	*1.6	*0.9	**0.7	^ 3.8
Private non-profit research institutions	*0.6	*0.1	*0.1	**0.1	*0.7
Commercial laboratories/research and development enterprises	**1.3	^ 0.1	*0.3	**0.7	*2.2
Other types of organisations	*1.1	**0.2	^ 0.1	^ 0.1	*1.3

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

(a) Calendar year.

(b) Proportions are of businesses reporting innovation in each location.

(c) Businesses could report more than one location.

(d) Businesses could report more than one type of collaboration.

CHAPTER **6**

SOURCES OF IDEAS AND METHODS OF ACQUIRING KNOWLEDGE OR ABILITIES

INTRODUCTION

Key inputs for innovation are ideas, knowledge and abilities.

Innovating businesses were asked to identify key sources of ideas or information, and which methods were used to acquire knowledge or abilities. Businesses could select more than one source or method. A ranking of importance was not required.

KEY SOURCES OF IDEAS OR INFORMATION

SOURCES OF IDEAS, 2001–2003 (a)(b), Innovating businesses

.....

	%
Internal sources	87.7
Market sources	86.9
Institutional sources	21.2
Other sources	62.8

.....

- (a) Calendar years.
- (b) Businesses could identify more than one source.

Internal sources

The majority (87.7%) of innovating businesses reported they sourced ideas or information from *Internal sources*. Within this group, 80% of innovating businesses reported they sourced ideas and information from within their business, rather than other parts of a wider enterprise group to which the business belonged.

Market sources

Market sources was reported by 86.9% of innovating businesses as the source of new ideas or information relating to innovation. Within this group, *Clients or customers* was the highest (64.5%) reported source. At the industry level, businesses in the Electricity, gas and water supply industry and the Retail trade industry reported higher proportions of the use of *Consultants* (59.2%)

Institutional sources

Institutional sources were the least used group at 21.2%. Innovating businesses in the Electricity, gas and water supply (28.2%), Cultural and recreational services (25.6%) and Mining (24.1%) industries reported higher proportions of *Government agencies*, as the source of ideas or information, than other industries.

METHODS USED TO ACQUIRE KNOWLEDGE OR ABILITIES

A significant proportion of innovating businesses either *Employed new skilled staff* (39.9%), *Used consultants* (36.9%) or *Acquired new equipment or technology for producing goods or services* (34.3%). All three of these methods were, most often, sourced from within 100 kilometres of the business location.

.....

METHODS USED TO
ACQUIRE KNOWLEDGE OR
ABILITIES *continued*

A small proportion of innovating businesses acquired knowledge or abilities from Higher education or research institutions. The most used method of acquiring knowledge from these types of institutions was *Employed new graduates* from *Australian higher education institutions*, which was used by 8.7% of innovating businesses.

6.1 SOURCES OF IDEAS OR INFORMATION, 2001–2003(a), Innovating businesses, by employment size

EMPLOYMENT SIZE(b)

	5–19 persons	20–99 persons	100 or more persons	Total
	%	%	%	%
SOURCES(c)				
Internal				
Within this business	78.5	83.2	82.3	80.0
Other parts of a wider enterprise group to which this business belongs	29.3	36.1	52.3	32.7
Market				
Clients or customers	62.5	67.7	70.6	64.5
Suppliers of equipment, materials, components or software	46.5	47.7	49.5	47.0
Consultants (including paid professional advice of all kinds)	^ 26.9	40.5	47.9	32.1
Competitors and other businesses from the same industry	41.9	50.4	43.7	44.4
Institutional				
Universities or other higher education institutes	^ 5.6	^ 11.4	^ 11.0	^ 7.6
Government agencies(d)	^ 8.7	^ 15.0	^ 19.4	^ 11.2
Private non-profit research institutions	** 2.2	* 2.4	* 6.0	* 2.5
Commercial laboratories/research and development enterprises	* 4.9	* 5.0	* 15.5	^ 5.6
Other				
Professional conferences, meetings, fairs and exhibitions	46.7	57.0	61.2	50.5
Web sites, journals	41.7	42.9	49.3	42.5
Other sources of ideas or information	* 3.9	* 3.2	^ 2.1	^ 3.6

- ^ estimate has a relative standard error of 10% to less than 25% and should be used with caution
- * estimate has a relative standard error of 25% to 50% and should be used with caution
- ** estimate has a relative standard error greater than 50% and is considered too unreliable for general use
- (a) Calendar years.
- (b) Proportions are of businesses reporting innovation in each employment size category.
- (c) Businesses could identify more than one source.
- (d) Includes all levels of government.

6.2 SOURCES OF IDEAS OR INFORMATION, 2001–2003(a), Innovating businesses, by states and territories

STATE/TERRITORY(b)

	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australian Capital Territory	Australia
	%	%	%	%	%	%	%	%	%
SOURCES(c)									
Internal									
Within this business	75.1	81.7	85.1	84.0	80.1	90.3	91.3	^ 80.3	80.0
Other parts of a wider enterprise group to which this business belongs	^ 34.9	^ 35.7	^ 27.1	^ 31.0	^ 26.6	*27.9	^ 37.1	*37.0	32.7
Market									
Clients or customers	62.0	66.6	63.3	69.0	65.9	^ 68.9	^ 61.4	^ 66.3	64.5
Suppliers of equipment, materials, components or software	^ 44.1	^ 49.3	54.8	^ 41.0	^ 45.6	^ 39.3	^ 44.3	^ 52.9	47.0
Consultants (including paid professional advice of all kinds)	^ 32.5	^ 36.6	^ 30.1	^ 21.8	^ 29.7	*21.7	*31.6	^ 49.3	32.1
Competitors and other businesses from the same industry	^ 41.8	^ 51.8	^ 37.2	^ 49.0	^ 42.9	*32.5	^ 54.6	^ 47.7	44.4
Institutional									
Universities or other higher education institutes	*6.9	*6.2	*9.9	*10.1	*7.9	**10.9	**7.9	**5.4	^ 7.6
Government agencies	^ 11.6	^ 8.5	*14.8	*8.8	*10.8	*17.9	*29.2	**9.2	^ 11.2
Private non-profit research institutions	**3.5	*0.5	**5.0	*1.4	*1.4	np	*0.7	np	*2.5
Commercial laboratories/research and development enterprises	*7.0	*3.6	^ 8.7	*2.0	*3.7	**10.7	*0.7	**3.0	^ 5.6
Other									
Professional conferences, meetings, fairs and exhibitions	48.6	49.3	59.9	^ 47.3	^ 47.7	^ 52.0	^ 53.9	^ 52.9	50.5
Web sites, journals	^ 34.7	^ 43.9	58.3	^ 44.6	^ 40.9	*40.3	^ 33.9	^ 49.5	42.5
Other sources of ideas or information	*2.7	*6.4	**2.8	**4.3	**0.4	—	—	**5.4	^ 3.6

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

— nil or rounded to zero (including null cells)

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

(a) Calendar years.

(b) Proportions are of businesses reporting innovation in each state/territory.

(c) Businesses could identify more than one source.

6.3 SOURCES OF IDEAS OR INFORMATION, 2001–2003(a), Innovating businesses, by industry

INDUSTRY(b)

	Mining	Manufacturing	Electricity, gas and water supply	Construction	Wholesale trade	Retail Trade	Accommodation, cafes and restaurants
	%	%	%	%	%	%	%

SOURCES(c)

Internal

Within this business	86.1	80.2	85.5	79.1	82.8	76.5	80.9
Other parts of a wider enterprise group to which this business belongs	43.7	^ 28.0	56.9	^ 12.3	^ 31.2	^ 42.2	^ 43.2

Market

Clients or customers	^ 51.3	71.1	47.7	54.6	71.6	^ 47.1	^ 78.7
Suppliers of equipment, materials, components or software	32.6	^ 51.5	50.4	46.8	^ 58.2	^ 49.0	^ 37.6
Consultants (including paid professional advice of all kinds)	39.5	^ 25.5	59.2	^ 23.5	^ 27.3	^ 32.9	^ 39.6
Competitors and other businesses from the same industry	^ 32.7	^ 37.8	47.3	38.7	^ 47.7	^ 44.8	^ 62.9

Institutional

Universities or other higher education institutes	^ 8.8	**6.4	20.4	^ 5.1	**6.2	**3.5	^ 12.9
Government agencies(d)	24.1	**8.2	28.2	^ 13.6	**6.4	*8.0	^ 18.6
Private non-profit research institutions	^ 3.5	**1.7	6.4	np	1.2	^ 5.8	**2.6
Commercial laboratories/research and development enterprises	9.3	**7.0	15.6	**1.0	*3.3	*4.4	**0.3

Other

Professional conferences, meetings, fairs and exhibitions	45.1	^ 40.9	57.4	36.5	^ 49.4	^ 52.9	^ 56.3
Web sites, journals	^ 39.5	^ 37.2	47.9	32.5	^ 41.8	^ 33.6	^ 55.5
Other sources of ideas or information	3.8	**3.0	8.0	^ 5.1	^ 0.3	1.6	^ 9.2

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

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

(a) Calendar years.

(b) Proportions are of businesses reporting innovation in each industry.

(c) Businesses could identify more than one source.

(d) Includes all levels of government.

6.3 SOURCES OF IDEAS OR INFORMATION, 2001–2003(a), Innovating businesses, by industry *continued*

INDUSTRY(b) *continued*

	<i>Transport and storage</i>	<i>Communications services</i>	<i>Finance and insurance</i>	<i>Property and business services</i>	<i>Cultural and recreational services</i>	<i>Total</i>
	%	%	%	%	%	%
SOURCES(c)						
Internal						
Within this business	88.0	83.6	83.2	79.7	78.9	80.0
Other parts of a wider enterprise group to which this business belongs	^ 37.9	^ 41.4	^ 42.1	*29.8	^ 35.7	^ 32.7
Market						
Clients or customers	^ 62.2	75.4	68.9	^ 69.6	66.9	^ 64.5
Suppliers of equipment, materials, components or software	^ 54.3	^ 44.6	^ 35.4	^ 41.7	^ 33.8	^ 47.0
Consultants (including paid professional advice of all kinds)	*22.5	^ 41.3	^ 33.5	^ 40.3	^ 34.4	^ 32.1
Competitors and other businesses from the same industry	^ 38.6	^ 56.4	^ 38.8	^ 44.0	^ 56.4	^ 44.4
Institutional						
Universities or other higher education institutes	**4.3	^ 17.9	**7.8	*11.3	^ 14.5	**7.6
Government agencies(d)	**9.0	*8.2	^ 16.2	*12.7	^ 25.6	**11.2
Private non-profit research institutions	np	3.5	**1.3	*2.1	*3.3	**2.5
Commercial laboratories/research and development enterprises	^ 2.3	**2.4	^ 5.6	*11.2	**1.2	^ 5.6
Other						
Professional conferences, meetings, fairs and exhibitions	*35.3	^ 49.6	^ 51.5	^ 62.2	^ 51.2	^ 50.5
Web sites, journals	*36.3	^ 52.1	^ 41.4	^ 55.2	^ 45.3	^ 42.5
Other sources of ideas or information	**2.2	**2.7	**1.2	^ 5.4	**5.9	**3.6

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

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

(a) Calendar years.

(b) Proportions are of businesses reporting innovation in each industry.

(c) Businesses could identify more than one source.

(d) Includes all levels of government.

6.4 METHODS USED TO ACQUIRE KNOWLEDGE OR ABILITIES DURING 2003(a),
 Innovating businesses, by method used and location of source

LOCATION OF SOURCE(b)(c)

	<i>From within 100km</i>	<i>From elsewhere in same state or territory</i>	<i>From elsewhere in Australia</i>	<i>From overseas</i>	<i>From any location</i>
	%	%	%	%	%
Methods used(d)					
Employed new skilled staff	35.0	^ 5.6	^ 5.3	^ 2.9	39.9
Interchange of staff with another business	^ 4.4	*1.2	*2.1	^ 1.6	^ 8.0
Used consultants (or other paid advisors)	27.4	^ 8.0	^ 5.7	*1.7	36.9
Acquired new equipment or technology for producing this business's goods or services	18.7	^ 6.1	^ 8.6	^ 7.9	34.3
Merger/takeover with/of another business (in whole or part)	^ 3.2	^ 0.4	*0.7	^ 0.1	^ 4.2
Other methods to acquire knowledge and abilities	*1.8	*0.6	*0.4	**0.7	*3.2

- ^ estimate has a relative standard error of 10% to less than 25% and should be used with caution
- * estimate has a relative standard error of 25% to 50% and should be used with caution
- ** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

- (a) Calendar year.
- (b) Proportions are of businesses reporting innovation.
- (c) Businesses could identify more than one location.
- (d) Businesses could identify more than one method.

6.5 METHODS USED TO ACQUIRE KNOWLEDGE OR ABILITIES DURING 2003(a),
 Innovating businesses, by method used and type of institution

TYPE OF INSTITUTION(b)(c)

	<i>From Australian higher education institutions</i>	<i>From other Australian research institutions</i>	<i>From overseas higher education or research institutions</i>	<i>From any institution</i>
	%	%	%	%
Methods used(d)				
Employed new graduate(s)	^ 8.7	*0.2	*0.3	^ 9.0
Employed academic or research staff	*1.0	*0.2	*0.1	*1.1
Used research results published by these institutions	^ 2.4	*2.9	^ 0.7	^ 5.0
Used research facilities of these institutions	*1.4	**1.8	**0.4	*3.1
Used patents, designs, or other intellectual property rights from these institutions	**0.5	*0.1	*0.1	*0.6
Used consultants from these institutions	*2.4	*1.2	**0.6	^ 3.2
Contracted out research and development to these institutions	*0.8	^ 0.5	*0.1	^ 1.2
Other methods to acquire knowledge or abilities from institutions	*2.2	**0.3	—	*2.5

- ^ estimate has a relative standard error of 10% to less than 25% and should be used with caution
- * estimate has a relative standard error of 25% to 50% and should be used with caution
- ** estimate has a relative standard error greater than 50% and is considered too unreliable for general use
- nil or rounded to zero (including null cells)
- (a) Calendar year.
- (b) Proportions are of businesses reporting innovation.
- (c) Businesses could identify more than one institution.
- (d) Businesses could identify more than one method.

INTRODUCTION

Businesses may seek a range of skills and capabilities when engaging people to introduce or implement new goods, services and/or processes.

Innovating businesses were asked to identify the broad range of skills and capabilities sought when engaging people to develop new goods or services or implement new operational or organisational/managerial processes. They were also asked where they looked to find people. A ranking of importance was not required.

SKILLS AND CAPABILITIES SOUGHT BY INNOVATIVE BUSINESSES WHEN ENGAGING PEOPLE

General business skills and capabilities were the most common skills and capabilities sought by businesses to develop and introduce both new goods or services (31.6%) and new processes (29.4%). *Marketing* skills were sought more for the development or introduction of new goods or services (31.0%), whereas *Information technology* skills were sought more for new processes (21.9%). *Scientific* skills and capabilities were sought by the least number of innovating businesses.

In most cases demand for skilled staff increased with the size of the innovating business. *Marketing* skills were sought by 47.1% of innovating businesses which employed 100 or more persons, for developing or introducing new goods or services and 50.2% of large innovating businesses sought *Information technology* skills to develop or implement new processes.

Large proportions of innovating businesses in the Mining (69.1%) and Electricity, gas and water supply (54.8%) industries sought *Engineering* skills to develop or introduce new processes, whereas these skills were reported by just 10.1% of total innovating businesses. *Information technology* skills were mostly sought by Communication services industries to develop or introduce new goods or services (58.0%) and new processes (50.5%), compared to 20.6% and 21.9% respectively for total innovating businesses.

WHERE BUSINESSES LOOKED TO FIND PEOPLE

Most businesses looked to find people already within the business with the skills and capabilities sought to develop or introduce new goods or services (54.5%) and/or implement new processes (47.8%). Innovating businesses also looked to find people at other *Businesses in Australia* for new goods or services (39.3%) and for new processes (34.7%).

WHERE BUSINESSES
LOOKED TO FIND PEOPLE
continued

RECRUITMENT SOURCES, 2001–2003(a), Innovating businesses

	WHERE BUSINESSES LOOKED TO FIND PEOPLE TO DEVELOP OR INTRODUCE OR IMPLEMENT(b)	
	<i>New goods or services</i>	<i>New processes(c)</i>
	%	%
People already within the business	54.5	47.8
People from outside the business	46.8	42.4

- (a) Calendar years.
- (b) Businesses could select more than one source.
- (c) Processes includes operational and organisational/managerial processes.

7.1 SKILLS AND CAPABILITIES SOUGHT, 2001–2003(a), Innovating businesses, by employment size

EMPLOYMENT SIZE(b)

	5–19 persons	20–99 persons	100 or more persons	Total
	%	%	%	%

TO DEVELOP OR INTRODUCE NEW GOODS OR SERVICES (c)

Engineering	^ 11.2	^ 19.3	^ 29.0	14.6
Scientific	* 2.0	* 8.1	^ 11.7	^ 4.3
Marketing	^ 26.6	37.6	47.1	31.0
Information technology	^ 19.4	^ 20.7	^ 32.0	^ 20.6
Product management	^ 13.5	^ 22.3	36.5	17.5
General business	^ 28.6	36.3	41.5	31.6
Other	^ 11.7	^ 8.2	^ 7.5	^ 10.4

TO DEVELOP OR IMPLEMENT NEW PROCESSES (c)(d)

Engineering	^ 6.2	^ 13.8	^ 32.4	10.1
Scientific	* 1.1	* 4.6	^ 7.8	^ 2.5
Marketing	^ 13.6	^ 26.4	^ 25.3	^ 18.0
Information technology	^ 17.3	^ 25.6	50.2	21.9
Product management	^ 8.2	^ 18.5	^ 24.4	^ 12.1
General business	^ 23.6	39.7	44.0	29.4
Other	^ 12.6	* 4.9	* 4.0	^ 9.9

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Calendar years.

(b) Proportions are of businesses reporting innovation in each employment size category.

(c) Businesses could identify more than one type of skill.

(d) Processes includes operational and organisational/managerial processes.

7.2 SKILLS AND CAPABILITIES SOUGHT, 2001–2003(a), Innovating businesses, by states and territories

STATE/TERRITORY(b)

	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australian Capital Territory	Australia
	%	%	%	%	%	%	%	%	%
TO DEVELOP OR INTRODUCE NEW GOODS OR SERVICES (c)									
Engineering	^ 15.4	^ 17.1	^ 12.3	^ 12.6	*12.9	*10.0	*16.0	*5.9	14.6
Scientific	*5.2	*4.6	**3.0	*0.9	**5.5	**9.1	np	**0.5	^ 4.3
Marketing	^ 22.6	*36.7	^ 38.3	^ 38.2	^ 29.3	*27.7	*20.8	*42.5	31.0
Information technology	^ 20.8	*19.8	^ 24.3	*15.1	^ 21.5	*10.9	*24.2	*22.4	^ 20.6
Product management	^ 16.4	*16.4	*17.8	^ 22.9	*18.0	*19.9	*18.7	**21.5	17.5
General business	^ 33.4	^ 31.8	^ 28.0	^ 29.2	^ 32.2	*24.4	^ 39.7	*34.7	31.6
Other	*9.6	*8.9	*12.4	*7.8	*13.3	**22.1	*27.9	*13.5	^ 10.4

TO DEVELOP OR IMPLEMENT NEW PROCESSES (c)(d)

Engineering	^ 11.5	*8.0	^ 9.2	^ 14.1	^ 8.4	*8.6	*19.6	**5.1	10.1
Scientific	*2.3	*2.8	*1.3	**3.7	*4.1	**4.5	np	**0.5	^ 2.5
Marketing	^ 17.6	^ 18.6	*18.0	^ 19.3	^ 14.9	*20.7	*22.6	**22.9	^ 18.0
Information technology	^ 23.0	^ 18.0	^ 29.4	^ 23.7	^ 14.0	*13.9	*24.9	*23.5	21.9
Product management	^ 12.5	^ 8.7	*15.1	^ 18.9	*9.2	*14.0	^ 11.3	*10.0	^ 12.1
General business	^ 27.9	^ 27.2	^ 34.3	^ 32.0	^ 29.7	*39.7	*17.8	*31.6	29.4
Other	*11.7	*6.2	*14.2	*7.5	*7.1	**21.3	**6.8	**2.7	^ 9.9

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

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

(a) Calendar years.

(b) Proportions are of businesses reporting innovation in each state/territory.

(c) Businesses could identify more than one source.

(d) Processes includes operational and organisational/managerial processes.

7.3 SKILLS AND CAPABILITIES SOUGHT, 2001–2003(a), Innovating businesses, by industry

INDUSTRY(b)

	Mining	Manufacturing	Electricity, gas and water supply	Construction	Wholesale trade	Retail trade	Accommodation, cafes and restaurants
	%	%	%	%	%	%	%
TO DEVELOP OR INTRODUCE NEW GOODS OR SERVICES (c)							
Engineering	^ 33.7	29.8	44.6	*19.2	*18.6	**6.0	**2.8
Scientific	*11.1	^ 7.8	20.1	**1.1	*5.4	np	np
Marketing	^ 28.4	31.8	33.3	*18.2	^ 51.6	*16.7	*34.3
Information technology	*20.0	^ 14.4	35.0	*17.4	*16.0	*14.8	*8.1
Product management	*19.8	22.3	27.0	**5.9	^ 27.2	*12.4	*24.6
General business	^ 26.5	25.6	31.9	^ 30.6	^ 30.8	*29.5	^ 48.9
Other	*2.2	^ 5.4	*8.5	*14.4	**2.2	*12.3	*26.8

TO DEVELOP OR IMPLEMENT NEW PROCESSES (c)(d)

Engineering	69.1	27.3	54.8	*14.2	*7.6	**2.8	^ 3.8
Scientific	*18.2	^ 5.6	21.7	**1.1	**2.4	np	np
Marketing	*22.1	15.7	29.1	*4.5	^ 22.5	*11.1	*24.6
Information technology	^ 22.1	21.4	55.1	*12.3	^ 21.4	*8.8	*12.4
Product management	*11.9	17.0	18.9	**4.0	^ 18.5	**8.0	*19.3
General business	^ 36.0	23.6	52.2	*20.2	^ 36.2	*23.7	*36.4
Other	*2.2	^ 3.1	7.3	*9.7	**2.9	**7.4	*14.7

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

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

(a) Calendar years.

(b) Proportions are of businesses reporting innovation for each industry.

(c) Businesses could identify more than one source.

(d) Processes includes operational and organisational/managerial processes.

7.3 SKILLS AND CAPABILITIES SOUGHT, 2001–2003(a), Innovating businesses, by industry *continued*

INDUSTRY(b) *continued*

	<i>Transport and storage</i>	<i>Communication services</i>	<i>Finance and insurance</i>	<i>Property and business services</i>	<i>Cultural and recreational services</i>	<i>Total</i>
	%	%	%	%	%	%
TO DEVELOP OR INTRODUCE NEW GOODS OR SERVICES (c)						
Engineering	*7.5	^28.2	**3.8	*13.1	**6.0	14.6
Scientific	**3.4	**3.7	**3.6	*7.8	**0.7	^4.3
Marketing	*16.5	^41.9	^33.6	^35.9	^40.9	31.0
Information technology	*15.2	^58.0	*21.7	^36.8	^25.3	^20.6
Product management	*11.9	^38.2	*19.6	*15.1	^17.4	17.5
General business	^27.5	^28.4	^29.8	^33.8	^39.3	31.6
Other	*8.8	np	*11.3	*11.0	*13.0	^10.4

TO DEVELOP OR IMPLEMENT NEW PROCESSES (c)(d)

Engineering	*4.8	^17.2	**3.8	*5.6	*2.5	10.1
Scientific	^0.3	**2.7	**1.3	*3.8	**1.2	^2.5
Marketing	*9.8	^32.4	^14.8	^25.6	^30.7	^18.0
Information technology	^14.4	^50.5	^34.0	^36.3	^35.7	21.9
Product management	*5.4	^25.5	^10.8	*10.1	^13.6	^12.1
General business	^25.0	^41.1	^29.0	^34.5	^45.6	29.4
Other	*14.1	np	*13.3	*19.3	**7.6	^9.9

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

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

(a) Calendar years.

(b) Proportions are of businesses reporting innovation for each industry.

(c) Businesses could identify more than one source.

(d) Processes includes operational and organisational/managerial processes.

7.4 RECRUITMENT SOURCES, 2001–2003(a), Innovating businesses

*Proportion
of
innovating
businesses*

%

.....
WHERE BUSINESSES LOOKED TO FIND
PEOPLE TO DEVELOP OR INTRODUCE NEW
GOODS OR SERVICES (b)

People already within this business	54.5
People outside this business recruited from:	
Businesses in Australia	39.3
Overseas businesses	^ 6.5
Australian universities	^ 5.5
Overseas universities	*0.6
Australian public sector research agencies	*1.4
Other Australian public sector agencies	^ 1.5
Elsewhere	^ 5.6

.....
WHERE BUSINESSES LOOKED TO FIND
PEOPLE TO DEVELOP OR IMPLEMENT NEW
PROCESSES (b)(c)

People already within this business	47.8
People outside this business recruited from:	
Businesses in Australia	34.7
Overseas businesses	^ 4.1
Australian universities	^ 5.9
Overseas universities	*0.6
Australian public sector research agencies	*1.2
Other Australian public sector agencies	*1.7
Elsewhere	^ 5.1

.....
^ estimate has a relative standard error of 10% to less than
25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and
should be used with caution

(a) Calendar years.

(b) Businesses could identify more than one source.

(c) Processes includes operational and organisational/managerial
processes.

INTRODUCTION

Businesses approach innovation with a view to obtaining some economic advantage from their efforts. If the intellectual resource is readily available to competitors, then the market advantage can be lost. Formal and informal methods are employed to protect the intellectual properties of businesses. The registration of patents has been used by analysts to compare innovation at the international level.

Businesses in the innovation survey were asked to indicate both formal and informal methods used to protect their intellectual property (IP) and could select more than one factor. A ranking of importance was not required.

INTELLECTUAL PROPERTY PROTECTION METHODS USED DURING 2003 (a), Innovating businesses(b)

	%
Formal methods	
Some formal methods	21.5
No formal methods	78.5
Informal methods	
Some informal methods	36.6
No informal methods	63.4
No formal or informal methods	55.0

- (a) Calendar year.
- (b) Businesses could select more than one method.

FORMAL METHODS

Typically formal methods would be used to protect IP that is new to the world. Over three quarters (78.5%) of innovative businesses reported that they had *No formal methods in use* to protect their IP. *Copyright or trademark* was the most common formal method reported by innovating businesses (17.0%). *Patents* were the second most common formal method used by 4.4% of innovating businesses.

The use of formal methods ranged from 16.8% for innovating businesses which employed 5–19 persons to 49.6% for innovating businesses which employed 100 or more persons. This pattern was relatively consistent across all states and territories. Victoria had the highest level of formal IP protection at 23.2%, while the Northern Territory had the lowest at 16.9%. The variation in businesses seeking formal protection was more marked across industries ranging from 36.0% of businesses in the Cultural and recreation services industry, to 9.0% in the Transport and storage industry. *Patents* were used most often in the Manufacturing industry with 12.4% of innovating businesses reporting this form of formal protection.

INFORMAL METHODS

The majority of businesses (63.4%) used no informal methods of IP. The most commonly used informal method was *Secrecy (including electronic protection methods)*, reported by 29.2% of innovating businesses.

In most cases, the use of informal methods of IP protection increased with business size, with over 50% of innovating businesses which employed 100 or more persons reporting some informal means. The variation in reported IP protection methods used at the state or territory level was greater for informal methods than formal methods, ranging from 51.4% of businesses in the Northern Territory down to 32.1% in South Australia.

The variation was even more marked at the industry level. Over half of the innovating businesses in the Communication services, Mining and Finance and insurance industries employed an informal method of protection, while in the Construction and Retail trade industries informal methods were used by 22.7% and 25% of innovating businesses respectively. Individual methods of informal protection also showed much greater variation at the industry level than at a state level.

8.1INTELLECTUAL PROPERTY PROTECTION METHODS USED DURING 2003(a),
Innovating businesses, by employment size

EMPLOYMENT SIZE(b)

	5-19 persons	20-99 persons	100 or more persons	Total
	%	%	%	%
.....				
Formal methods used(c)				
Patents	*2.2	^6.9	^15.9	^4.4
Registration of design	*2.6	^3.3	^14.0	^3.6
Copyright or trademark	^14.3	^17.6	40.5	^17.0
Other formal methods	*2.3	*4.5	*5.6	^3.1
No formal methods used	83.2	74.1	50.4	78.5
Informal methods used(c)				
Secrecy (including electronic protection methods)	^25.5	^34.3	45.4	29.2
Complexity of product design	^4.4	^12.5	^15.2	^7.4
Making frequent and rapid changes to the good or service	*5.1	^8.5	^10.9	^6.4
Other informal methods	*2.0	*6.5	^4.7	*3.4
No informal methods used	68.9	53.7	48.4	63.4

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Calendar year.

(b) Proportions are of businesses reporting innovation in each employment size category.

(c) Businesses could identify more than one method.

8.2 INTELLECTUAL PROPERTY PROTECTION METHODS USED DURING 2003(a), Innovating businesses, by states and territories

	STATE/TERRITORY(b)								
	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australian Capital Territory	Australia
	%	%	%	%	%	%	%	%	%
Formal methods used(c)									
Patents	^ 3.7	*5.1	*4.7	*4.9	*4.9	*4.9	**7.0	*1.3	^ 4.4
Registration of design	*3.9	*4.2	*3.1	*2.0	*3.5	^ 0.8	**2.8	**0.9	^ 3.6
Copyright or trademark	^ 17.6	^ 19.7	^ 13.5	*13.5	*17.6	*15.6	*13.8	*10.5	^ 17.0
Other formal methods	**1.2	*2.9	*6.1	*5.1	*4.2	**2.0	**2.1	**6.6	^ 3.1
No formal methods used	78.4	76.8	79.5	80.7	78.1	80.6	83.1	82.8	78.5
Informal methods used(c)									
Secrecy (including electronic protection methods)	^ 25.8	^ 26.7	^ 39.6	^ 26.1	^ 34.4	*35.3	^ 38.0	*24.6	29.2
Complexity of product design	^ 7.2	^ 8.1	^ 5.3	*7.3	*9.5	*4.4	*3.7	**13.0	^ 7.4
Making frequent and rapid changes to the good or service	*7.4	*8.6	*3.0	*4.0	*2.4	**8.3	*18.0	**13.0	^ 6.4
Other informal methods	**3.7	*3.5	**3.1	*3.9	*2.5	np	np	**6.0	*3.4
No informal methods used	65.0	67.0	53.4	67.9	60.4	^ 62.9	^ 48.6	^ 65.4	63.4

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

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

(a) Calendar year.

(b) Proportions are of businesses reporting innovation in each state/territory.

(c) Businesses could identify more than one method.

8.3 INTELLECTUAL PROPERTY PROTECTION METHODS USED DURING 2003(a), Innovating businesses, by industry

Industry(c)	FORMAL METHODS USED(b)				INFORMAL METHODS USED(b)					
	Patents	Registration of design	Copyright or trademark	Other formal methods	No formal methods used	Secrecy (including electronic protection methods)	Complexity of product design	Making frequent and rapid changes to the good or service	Other informal methods	No informal methods used
	%	%	%	%	%	%	%	%	%	%
Mining	*8.6	^ 1.4	*8.6	^ 1.8	85.0	^ 42.4	*11.5	np	*3.9	^ 48.2
Manufacturing	^ 12.4	^ 9.7	18.6	^ 2.8	71.2	28.4	20.1	^ 8.4	^ 3.5	58.0
Electricity, gas and water supply	8.0	7.4	19.3	11.0	73.7	39.6	7.6	*5.5	^ 8.6	50.6
Construction	**1.4	**3.6	*7.9	^ 1.0	87.7	^ 21.0	**3.7	**1.0	**1.2	77.3
Wholesale trade	*4.8	*6.3	^ 20.2	*4.5	71.4	^ 35.2	*9.8	*10.1	**5.2	54.4
Retail trade	**0.2	**1.2	*13.3	**0.8	85.7	*23.7	**1.3	**2.0	**0.4	^ 75.0
Accommodation, cafes and restaurants	**0.3	**0.4	*18.5	*0.2	81.3	*22.2	np	*18.2	**1.7	^ 65.5
Transport and storage	**1.8	**2.1	*7.6	**0.9	91.0	^ 26.0	*6.1	**7.1	*4.9	^ 60.3
Communication services	*12.3	*10.8	^ 33.7	*8.0	58.1	^ 46.6	^ 27.4	*17.8	*4.9	^ 39.4
Finance and insurance	**3.6	**4.0	*20.5	*8.9	^ 71.6	^ 45.7	*14.9	**6.8	*10.0	^ 48.7
Property and business services	**4.6	*0.3	^ 18.1	*5.5	79.0	^ 34.0	*3.5	**5.5	**4.9	59.2
Cultural and recreation services	*2.0	**2.7	^ 35.1	**3.5	^ 64.0	^ 28.5	*6.2	**3.2	**4.5	70.2
Total	^ 4.4	^ 3.6	^ 17.0	^ 3.1	78.5	29.2	^ 7.4	^ 6.4	*3.4	63.4

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

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

(a) Calendar year.

(b) Businesses could identify more than one method.

(c) Proportions are of businesses reporting innovation in each industry.

INTRODUCTION

The degree of novelty of an innovation and whether the innovation is performed within the business or externally are important factors in analysing innovation.

In order to assess development activity, innovating businesses were asked the following in regard to the new or significantly improved goods or services and new or significantly improved operational processes:

- whether the goods, services or processes were new to the industry, Australia or the world
- who developed the goods, services or processes.

Businesses could provide more than one answer to each question. A ranking of importance was not required.

DEGREE OF NOVELTY

Introducing goods or services that were *New to the world* was reported by 9.2% of innovating businesses. Only 2.5% of innovating businesses reported introducing processes that were *New to the world*. More innovating businesses introduced goods or services that were *New to Australia* (26.5%) than introduced processes that were *New to Australia* (7.4%).

WHO DEVELOPED

Development within the business or a related company was reported most often for both new goods or services (62.5%), and new operational processes (57.9%). Proportions of innovating businesses who developed new goods, services or processes in co-operation with other businesses or institutions were similar to those who adopted innovations developed by other businesses or institutions, for both goods or services and operational processes (ranging from 24.1% to 28.7%).

9.1 CHARACTERISTICS OF NEW GOODS OR SERVICES INTRODUCED, 2001–2003 (a), Innovating businesses

	<i>Proportion of innovating businesses that introduced new goods or services(b)</i>
	%
Degree of novelty of the new goods or services developed	
new to the industry	35.5
new to Australia	^ 26.5
new to the world	^ 9.2
Who developed the new goods or services	
this business or related company	62.5
this business in co-operation with other business(es) or institution(s)	^ 27.0
other business(es) or institution(s)	^ 24.1

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

- (a) Calendar years.
(b) Also includes significantly improved goods or services.

9.2 CHARACTERISTICS OF NEW OPERATIONAL PROCESSES IMPLEMENTED, 2001– 2003 (a), Innovating businesses

	<i>Proportion of innovating businesses that implemented new operational processes(b)</i>
	%
Degree of novelty of the new operational processes developed	
new to the industry	^ 21.6
new to Australia	^ 7.4
new to the world	* 2.5
Who developed the new operational processes	
this business or related company	57.9
this business in co-operation with other business(es) or institution(s)	28.7
other business(es) or institution(s)	^ 25.1

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

- (a) Calendar years.
(b) Also includes significantly improved operational processes.

INTRODUCTION

Businesses were asked questions related to their expenditure on innovation for their most recent financial year ended on or before 30 September 2003. Readers should note that many businesses were only able to provide an estimate of their expenditure on innovation, and therefore these data should be used with caution. Negligible amounts recorded against expense items may be due to the unavailability of information rather than minimal spending. Caution is also required in interpreting these data as businesses classified as innovative were those that undertook innovation in the three calendar years to December 2003, whereas expenditure data were collected for the 2002–03 financial year.

EXPENDITURE ON INNOVATION AND RELATED ACTIVITIES

Total expenditure on innovation and related activities includes expenditure on research and experimental development. Total expenditure by all businesses on innovation and related activities in 2002–03 was \$20,296.6 million, which is a gross estimate that includes acquired research and development expenditure. This was 1.7% of total business expenditure. Innovating businesses spent \$18,923.9 million on innovation and related activities which was 2.4% of their total expenditure.

EXPENDITURE ON INNOVATION AND RELATED ACTIVITIES, 2002–03 (a) (b)

	INNOVATING BUSINESSES		ALL BUSINESSES	
	Expenditure	Proportion of total expenditure	Expenditure	Proportion of total expenditure
		\$m		%
Expenditure on research and experimental development(c)(d)	5 800.6	0.7	7 167.0	0.6
Expenditure on innovation	^ 13 123.4	^ 1.7	^ 13 129.6	^ 1.1
Total expenditure on innovation and related activities(d)	^ 18 923.9	^ 2.4	^ 20 296.6	^ 1.7

- ^ estimate has a relative standard error of 10% to less than 25% and should be used with caution
- (a) Expenditure estimates should be used with care, see Technical Notes for more detail.
- (b) Data relates to the most recent financial year ended on or before 30 September 2003.
- (c) See Explanatory Notes paragraph 19 on comparisons with the Research and Experimental Development collection.
- (d) Includes \$914.2 million of expenditure on acquired research and experimental development by innovating businesses and \$1017.8 million by all businesses.

EXPENDITURE ON INNOVATION BY INNOVATING BUSINESSES

Expenditure on innovation accounted for 1.7% of total expenditure by innovating businesses in 2002–03. Although a lower proportion of businesses introduced goods and services (16.6%), than operational processes (22.9%) and organisational/managerial processes (21.4%) (see Table 1.2), this type of innovation attracted a higher percentage

EXPENDITURE ON
INNOVATION BY
INNOVATING BUSINESSES
continued

of expenditure (1.1%) compared to operational processes (0.4%) and organisational/managerial processes (0.2%), as a proportion of total expenditure.

Innovating businesses which employed 20–99 persons spent 3.2% of their total expenditure on innovation. Only 1.3% of total expenditure was spent on innovation by innovating businesses which employed 100 or more persons.

Expenditure by businesses in South Australia on innovation, as a proportion of their total expenditure (3.2%), was higher than other states and territories.

Innovating businesses in the Manufacturing (2.2%), Wholesale trade (2.9%) and Communication services (2.7%) industries had higher proportions of expenditure on innovation than other industries.

EXPENDITURE ON INNOVATION, 2002-03(a), innovating businesses

	\$m
Expenditure related to the introduction of new or significantly improved goods or services	
Acquisition of machinery and equipment	3 478.0
Acquisition of licences, patents and other intellectual property	*397.5
Training	274.5
Market related expenditure aimed at market introduction	^ 1 499.4
Substantial new design work	^ 737.8
Other	**2 379.1
Total expenditure relating to the introduction of new or significantly improved goods or services	^ 8 766.2
Expenditure related to the introduction of new or significantly improved operational processes	3 011.7
Expenditure related to the introduction of new or significantly improved organisational/managerial processes	1 345.5
Total(b)	^ 13 123.4

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

(a) Data relates to the most recent financial year ended on or before 30 September 2003.

(b) Where figures have been rounded, discrepancies may occur between the sum of component items and the total.

SOURCE OF FUNDS FOR
INNOVATION
EXPENDITURE BY
INNOVATING BUSINESSES

Funding from *Internal sources* accounted for 75.5% of the total expenditure on innovation, with funds from *Borrowings* accounting for a further 12.4%.

EXPENDITURE ON
RESEARCH AND
EXPERIMENTAL
DEVELOPMENT

Expenditure on research and experimental development (R&D) was collected in the survey but was excluded as a component of expenditure on innovation as R&D does not refer to the introduction or implementation of new or significantly improved goods or services or operational or organisational/managerial processes.

Almost one third (30.9%) of innovating businesses recorded spending on R&D in 2002–03, compared to 5.9% of non-innovating businesses.

Innovating businesses accounted for over 80% of the total reported business expenditure on R&D in 2002–03.

EXPENDITURE ON
RESEARCH AND
EXPERIMENTAL
DEVELOPMENT
*continued*EXPENDITURE ON RESEARCH AND EXPERIMENTAL DEVELOPMENT,
2002–03(a), All businesses

	<i>Proportion of businesses who recorded spending on Research and Experimental Development</i>	<i>Business expenditure on Research and Experimental Development(b)</i>
	<i>%</i>	<i>\$m</i>
Innovating businesses	30.9	5 800.6
Non-innovating businesses	[^] 5.9	*1 366.4
Total businesses	14.6	7 167.0

[^] estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Data relates to the most recent financial year ended on or before 30 September 2003.

(b) See Explanatory Notes paragraph 19 on comparisons with the Research and Experimental Development collection.

10.1

INNOVATION EXPENDITURE AS A PROPORTION OF TOTAL BUSINESS
EXPENDITURE, 2002–03 (a), Innovating businesses, by employment size

	EMPLOYMENT SIZE			
	5–19 persons	20–99 persons	100 or more persons	Total
	%	%	%	%
Expenditure related to the introduction of new or significantly improved goods or services				
Acquisition of machinery and equipment to develop new goods or services	*0.5	*0.5	0.4	0.4
Acquisition of licences, patents and other intellectual property	**0.1	—	—	*0.1
Training related to new goods or services	*0.1	—	—	—
Market related expenditure aimed at market introduction	*0.2	*0.2	^0.2	^0.2
Substantial new design work	*0.2	*0.1	^0.1	^0.1
Other	*0.1	**1.6	^0.1	**0.3
<i>Total goods or services</i>	<i>*1.2</i>	<i>**2.5</i>	<i>0.8</i>	<i>^1.1</i>
Expenditure related to the implementation of new or significantly improved operational processes				
Expenditure related to the implementation of new or significantly improved organisational/managerial processes	^0.5	0.6	0.3	0.4
Total goods, services and processes (b)	^1.9	3.2	1.3	^1.7

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

— nil or rounded to zero (including null cells)

(a) Data relates to the most recent financial year ended on or before 30 September 2003.

(b) Where figures have been rounded, discrepancies may occur between the sum of the component items and the total.

10.2 INNOVATION EXPENDITURE AS A PROPORTION OF TOTAL BUSINESS EXPENDITURE, 2002–03 (a), Innovating businesses, by states and territories

	STATE/TERRITORY								
	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australian Capital Territory	Australia
	%	%	%	%	%	%	%	%	%
Expenditure related to the introduction of new or significantly improved goods or services									
Acquisition of machinery and equipment to develop new goods or services	^ 0.4	^ 0.3	^ 0.7	*1.2	^ 0.6	**0.2	**0.2	^ 0.4	0.4
Acquisition of licences, patents and other intellectual property	—	—	**0.2	—	—	—	—	^ 0.2	*0.1
Training related to new goods or services	—	—	—	—	—	—	—	**0.1	—
Market related expenditure aimed at market introduction	^ 0.1	^ 0.2	^ 0.2	*0.9	^ 0.1	**0.1	—	**0.1	^ 0.2
Substantial new design work	*0.1	^ 0.1	*0.1	^ 0.1	—	**0.1	**0.1	**0.1	^ 0.1
Other	—	**0.9	—	**0.5	^ 0.1	—	^ 0.3	**0.2	**0.3
Total goods and services	^ 0.7	*1.6	^ 1.3	*2.8	^ 0.8	**0.4	^ 0.6	*1.2	^ 1.1
Expenditure related to the implementation of new or significantly improved operational processes	^ 0.4	^ 0.4	0.4	^ 0.4	^ 0.6	**0.2	^ 1.0	*0.7	0.4
Expenditure related to the implementation of new or significantly improved organisational/managerial processes	^ 0.2	^ 0.2	^ 0.3	^ 0.1	^ 0.2	**0.1	*0.2	*0.3	0.2
Total goods, services and processes(b)	^ 1.2	*2.1	^ 2.0	^ 3.2	^ 1.6	**0.7	^ 1.8	^ 2.2	^ 1.7

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

— nil or rounded to zero (including null cells)

(a) Data relates to the most recent financial year ended on or before 30 September 2003.

(b) Where figures have been rounded, discrepancies may occur between the sum of component items and the total.

10.3

INNOVATION EXPENDITURE AS A PROPORTION OF TOTAL BUSINESS

EXPENDITURE, 2002–03 (a), Innovating businesses, by industry

	INDUSTRY						
	Mining	Manufacturing	Electricity, gas and water supply	Construction	Wholesale trade	Retail trade	Accommodation, cafes and restaurants
	%	%	%	%	%	%	%
Expenditure related to the introduction of new or significantly improved goods or services							
Acquisition of machinery and equipment to develop new goods or services	^ 0.7	0.7	0.1	0.2	^ 0.2	—	*0.9
Acquisition of licences, patents and other intellectual property	—	—	—	—	—	—	**0.1
Training related to new goods or services	—	—	—	*0.1	—	—	*0.1
Market related expenditure aimed at market introduction	—	*0.4	—	—	^ 0.4	**0.1	**0.2
Substantial new design work	—	^ 0.2	—	**0.2	**0.1	—	—
Other	^ 0.1	^ 0.1	—	—	**1.8	—	—
Total goods and services	^ 0.8	1.5	0.2	*0.6	**2.4	**0.2	*1.4
Expenditure related to the implementation of new or significantly improved operational processes							
	0.8	0.5	0.7	*0.4	*0.4	*0.1	*0.2
Expenditure related to the implementation of new or significantly improved organisational/managerial processes							
	^ 0.1	0.1	0.1	*0.2	^ 0.1	**0.1	*0.3
Total goods, services and processes^(b)	^ 1.7	2.2	1.0	*1.2	**2.9	*0.4	^ 1.8

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

— nil or rounded to zero (including null cells)

(a) Data relates to the most recent financial year ended on or before 30 September 2003.

(b) Where figures have been rounded, discrepancies may occur between the sum of component items and the total.

10.3

INNOVATION EXPENDITURE AS A PROPORTION OF TOTAL BUSINESS

EXPENDITURE, 2002–03 (a), Innovating businesses, by industry *continued*INDUSTRY *continued*

	<i>Transport and storage</i>	<i>Communication services</i>	<i>Finance and insurance</i>	<i>Property and business services</i>	<i>Cultural and recreational services</i>	<i>Total</i>
	%	%	%	%	%	%
Expenditure related to the introduction of new or significantly improved goods or services						
Acquisition of machinery and equipment to develop new goods or services	^ 0.8	*1.9	^ 0.4	**0.3	**0.4	*0.4
Acquisition of licences, patents and other intellectual property	—	*0.1	^ 0.1	**0.1	—	0.1
Training related to new goods or services	—	—	^ 0.1	—	—	—
Market related expenditure aimed at market introduction	^ 0.1	*0.1	^ 0.2	**0.1	**0.1	^ 0.2
Substantial new design work	—	—	^ 0.1	*0.1	—	^ 0.1
Other	—	**0.1	^ 0.1	**0.2	**0.1	**0.3
Total goods and services	^ 0.9	*2.1	^ 0.9	**0.8	**0.6	^ 1.1
Expenditure related to the implementation of new or significantly improved operational processes						
	^ 0.5	*0.5	^ 0.2	**0.4	**0.2	0.4
Expenditure related to the implementation of new or significantly improved organisational/managerial processes						
	^ 0.1	^ 0.1	^ 0.4	^ 0.2	—	0.2
Total goods, services and processes (b)	^ 1.5	*2.7	^ 1.5	*1.5	**0.8	^ 1.7

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

— nil or rounded to zero (including null cells)

(a) Data relates to the most recent financial year ended on or before 30 September 2003.

(b) Where figures have been rounded, discrepancies may occur between the sum of component items and the total.

10.4

SOURCE OF FUNDS FOR INNOVATION EXPENDITURE, 2002–03(a), Innovating businesses, by employment size

	EMPLOYMENT SIZE(b)			
	5–19 persons	20–99 persons	100 or more persons	Total
	%	%	%	%
Internal sources	^ 57.8	^ 77.0	79.2	75.5
External equity (venture capital)	*0.6	**2.4	^ 0.4	*1.0
External equity (other)	**5.1	**4.4	*7.6	*6.3
Borrowings	*32.9	**9.0	9.1	^ 12.4
Funds from Commonwealth government	*0.4	**2.3	^ 1.6	*1.7
Funds from State or local government	*1.1	**1.9	^ 0.4	**0.9
Other	**2.0	**2.9	*1.7	*2.1
Total(c)	100.0	100.0	100.0	100.0

- ^ estimate has a relative standard error of 10% to less than 25% and should be used with caution
- * estimate has a relative standard error of 25% to 50% and should be used with caution
- ** estimate has a relative standard error greater than 50% and is considered too unreliable for general use
- (a) Data relates to the most recent financial year ended on or before 30 September 2003.
- (b) The amounts shown are proportions of the total expenditure on innovation for each business employment size category accounted for by each source of funding.
- (c) Where figures have been rounded, discrepancies may occur between the sum of component items and the total.

10.5 SOURCE OF FUNDS FOR INNOVATION EXPENDITURE, 2002–03(a), Innovating businesses, by states and territories

STATE/TERRITORY(b)

	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australian Capital Territory	Australia
	%	%	%	%	%	%	%	%	%
Internal sources	66.1	86.6	78.4	^ 60.9	85.7	78.3	76.2	*61.2	75.5
External equity (venture capital)	**1.8	*0.5	**0.5	*0.9	^ 0.6	—	—	**1.1	*1.0
External equity (other)	*11.9	**0.4	^ 4.7	**13.1	**1.3	^ 0.3	—	**3.7	*6.3
Borrowings	*17.4	*7.4	^ 14.2	*11.8	^ 9.7	^ 19.7	23.3	^ 21.4	^ 12.4
Funds from Commonwealth government	**2.0	*2.2	*0.4	**0.2	**0.6	*1.4	—	*12.1	*1.7
Funds from State or local government	*0.3	*0.5	*0.1	**5.3	*1.1	*0.2	**0.1	**0.6	**0.9
Other	*0.4	**2.4	**1.7	**7.8	**0.9	**0.1	**0.3	—	*2.1
Total(c)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

— nil or rounded to zero (including null cells)

(a) Data relates to the most recent financial year ended on or before 30 September 2003.

(b) The amounts shown are proportions of the total expenditure on innovation for each state and territory accounted for by each source of funding.

(c) Where figures have been rounded, discrepancies may occur between the sum of component items and the total.

10.6**SOURCE OF FUNDS FOR INNOVATION EXPENDITURE, 2002–03(a), Innovating businesses, by industry**

SOURCE OF FUNDS FOR INNOVATION

	<i>Internal sources</i>	<i>External equity (venture capital)</i>	<i>External equity (other)</i>	<i>Borrowings</i>	<i>Commonwealth government</i>	<i>State or local government</i>	<i>Other</i>
	%	%	%	%	%	%	%
Industry(b)							
Mining	85.9	*7.4	**0.2	^5.7	—	—	*0.8
Manufacturing	78.1	**1.9	*0.8	^12.6	^2.2	^0.5	*3.9
Electricity, gas and water supply	91.9	2.2	—	1.7	0.1	4.2	—
Construction	**39.0	**0.8	**5.2	**54.5	—	**0.5	**0.1
Wholesale trade	94.6	—	**0.3	**4.8	**0.1	—	**0.2
Retail trade	80.4	—	—	*19.3	**0.2	—	—
Accommodation, cafes and restaurants	^64.7	**0.5	—	*32.4	—	—	**2.3
Transport and storage	60.6	**2.6	*1.2	^34.0	^0.1	0.4	**1.0
Communication	*23.8	*0.7	^61.0	*11.4	3.0	—	—
Finance and insurance	88.4	—	^4.3	^5.5	0.7	—	**1.1
Property and business services	^63.7	—	**12.8	**6.2	**6.4	**4.7	**6.2
Cultural and recreational services	^59.6	^0.4	**4.2	*24.1	**1.6	*8.3	**1.8
Total	75.5	*1.0	*6.3	^12.4	*1.7	**0.9	*2.1

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

— nil or rounded to zero (including null cells)

(a) Data relates to the most recent financial year ended on or before 30 September 2003.

(b) The amounts shown are proportions of the total expenditure on innovation for each industry accounted for by each source of funding.

10.7 RESEARCH AND EXPERIMENTAL DEVELOPMENT EXPENDITURE, 2002-03(a), All businesses, by type of expenditure

EXPENDITURE ON RESEARCH AND
EXPERIMENTAL DEVELOPMENT(b)
.....

	<i>Performed by the business</i>	<i>Acquired from other businesses or research institutions</i>	<i>Total</i>
	\$m	\$m	\$m
Non-innovating businesses	*1 262.8	*103.6	*1 366.4
Innovating businesses	4 886.3	^ 914.2	5 800.6
All businesses(c)	6 149.2	1 017.8	7 167.0

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Data relates to the most recent financial year ended on or before 30 September 2003.

(b) See Explanatory Notes paragraph 19 on comparisons with the Research and Experimental Development collection.

(c) Where figures have been rounded, discrepancies may occur between the sum of component items and the total.

EXPLANATORY NOTES

INTRODUCTION

1 This publication, *Innovation in Australian Business, 2003* presents results from the Innovation Survey 2003. The Innovation survey provides statistics on business innovation in Australia and key characteristics of innovating businesses. The availability of this information facilitates development of government policy and practices to improve Australia's international competitiveness by supporting and promoting innovation in Australian business.

2 This survey was conducted with some funding from the Department of Education, Science and Training and the Department of Industry, Tourism and Resources.

REFERENCE PERIOD

3 The main reference period for the Innovation survey is the three year calendar period 2001–03. Some data from the survey relate to the calendar year 2003. Financial data relates to the most recent financial year ended on or before 30 September, 2003.

SCOPE AND COVERAGE

4 The scope of the Innovation Survey 2003 is based on a combination of factors including user requirements, resource and provider load constraints, and international standards. The scope is all businesses in Australia with employment recorded on the ABS Business Register of more than 4 employees, except those classified to:

- SISCA 3000 General Government
- SISCA 6000 Rest of the world
- ANZSIC Division A Agriculture, Forestry and Fishing
- ANZSIC Division M Government Administration and Defence
- ANZSIC Division N Education
- ANZSIC Division O Health and Community Services
- ANZSIC Division Q Personal and Other Services

5 The frame for the Innovation Survey 2003, like most ABS economic collections, is taken from the ABS Business Register. Employing businesses are identified primarily based on registrations to the Australian Taxation Office's (ATO) Pay As You Go Withholding (PAYGW) scheme. Businesses which have ceased employing are identified when the ATO cancels their Australian Business Number (ABN) and/or PAYGW registration. In addition, businesses with less than 50 employees which did not remit under the PAYGW scheme in each of the previous five quarters are not included on the frame. The estimates in this publication include an allowance for businesses that are registered after the frame is taken but before the end of the reference period.

STATISTICAL UNITS DEFINED ON THE ABS BUSINESS REGISTER

6 The ABS uses an economic statistics units model on the ABS Business Register to describe the characteristics of businesses, and the structural relationships between businesses. The units model is also used to break groups of related businesses into relatively homogenous components that can provide data to the ABS.

7 In mid 2002, to better use the information available as a result of The New Tax System (TNTS), the ABS changed its economic statistics units model. The new units model allocates businesses to two sub-populations. The vast majority of business 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

8 Most businesses and organisations in Australia need to obtain an ABN, and are then included on the ATO Australian Business Register. Most of these businesses have simple structures; therefore 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 as the statistical unit.

ABS MAINTAINED
POPULATION

9 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 each 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 covers such businesses.

- *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 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.

- *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).

- *Type of Activity Unit (TAU)*: The 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. When a minimum set of data items are 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 the 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. Where a TAU has significant activity in more than one industry, the ABS will 'split' the TAU to maintain industry homogeneity.

INNOVATION SURVEY
STATISTICAL UNIT

10 For the Innovation Survey 2003, the statistical unit is the ABN unit for businesses with simple structures, and the TAU for businesses with complex structures.

SURVEY METHODOLOGY

11 The Innovation Survey 2003 was conducted by mail. It was based on a random sample of approximately 8,500 businesses which was stratified by industry, state/territory and number of employees. All businesses with 200 or more employees were included in the sample.

INNOVATING BUSINESSES

12 Businesses were not directly asked if they undertook any innovation in the three years ending December 2003. Instead, businesses were classified as innovating by at least one affirmative response to any one of three questions asked on the survey form. They were asked if:

- the business introduced any new or significantly improved goods or services
- the business implemented any new or significantly improved operational processes
- the business implemented any new or significantly improved organisational/managerial processes.

COMPARABILITY OF RESULTS
Historical

13 Results from the previous ABS surveys *Innovation in Australian Manufacturing, 1994*, *Innovation in Selected Industries 1993–94*, *Innovation in Manufacturing, 1996–97* and *Innovation in Mining, 1996–97* are not fully comparable with those from this survey, *Innovation in Australian Business, 2003*. The main differences are listed below:

Historical continued

- The previous Manufacturing and Mining surveys' definition of innovation did not include new and/or improved services and non-technological innovations to new or significantly improved goods and services and operational processes.
- The 1996–97 Mining survey used an industry specific form that explicitly asked if businesses used a range of advanced mining technologies. These were then classified as innovative processes. The 2003 industry wide form used generic examples of innovative processes, and mining businesses made their own judgements on whether their processes were innovative. This may have led to a lower proportion of mining businesses identifying themselves as innovating in 2003.
- *Innovation in Australian Business, 2003* excludes businesses with less than 5 employees whereas the previous Manufacturing and Mining surveys included all employing businesses.
- The introduction of TNTS in mid 2002 had a number of significant impacts on the population from which the Innovation Survey 2003 was drawn. These are discussed in Information Paper, *Improvements in ABS Economic Statistics [Arising from the New Tax System]* (cat.no. 1372.0). Apart from a smaller survey frame and different statistical units, compositional changes due to the new methodology for determining the employment variable and the use of ATO industry codes impacted on the stratification of units on the survey frame.

14 Adjustments were made to the data from the 1993–94 and 1996–97 Manufacturing industry surveys and the Innovation Survey 2003 to allow the comparisons provided in the Main Features of this publication to be made (see paragraphs 12 and 13 for more detail). These changes consisted of excluding:

- innovation associated with the implementation of new or significantly improved organisational/managerial processes from the 2003 data
- businesses with less than 5 employees recorded on the ABS Business Register using data from the previous Manufacturing surveys.

European Union

15 Eurostat conducted a business innovation survey in respect of the years 1998–2000 (except for Norway where the survey covered 1999–2001), releasing the publication *Innovation in Europe, Results for the EU, Iceland and Norway*, in 2004. Users should note that the Eurostat data is not directly comparable with Australian data. The Eurostat survey differed in definition, scope and coverage. The Eurostat definition of innovation excluded the implementation of new or significantly improved organisational/managerial process and combined innovation for new goods and services and operational processes. Their population scope differed from the ABS survey in that businesses were included if they had 10 or more employees. Businesses classified to the following Statistical Classification of Economic Activities in the European Community (NACE Rev.1) were included from the Eurostat survey:

- Business economy defined as Industry Sector:
 - Mining and quarrying
 - Manufacturing
 - Electricity, gas and water supply
- Business economy defined as Services Sector:
 - Wholesale trade and commission trade
 - Transport and communication
 - Financial intermediation
 - Business services (Computer activities; R & D; engineering activities and consultancy; and technical testing and analysis)

16 Adjustments have been made to the Australian data to allow the comparisons provided in the Main Features of this publication to be made. These changes consisted of excluding:

European Union continued

- innovation associated with the implementation of new or significantly improved organisational/managerial processes
- businesses with less than 10 employees
- businesses in ANZSIC industry subdivision 77 Property Services.

New Zealand

17 Statistics New Zealand conducted a business innovation survey in respect of the three years ended August 2003, releasing the publication *Innovation in New Zealand 2003*, in July 2004. Users should note that the New Zealand data is not directly comparable with Australian data. The New Zealand survey differed in definition and scope compared with the ABS survey. The New Zealand definition of innovation excluded the implementation of new or significantly improved organisational/managerial process and combined innovation for new goods and services and operational processes.

- Their population scope differed from the ABS survey in that businesses were included if:

- they had 10 employees or more
- they had annual GST turnover of greater than \$NZ30,000
- they were operating for one year or more

- Additionally, businesses:
 - classified to ANZSIC industry division Agriculture Forestry and Fishing were included
 - classified to ANZSIC industries Retail trade; Accommodation, cafes and restaurants, Property services, and Sport and recreation were excluded.

18 Adjustments were made to the data from both the Innovation Survey, 2003 and the Innovation in New Zealand, 2003 survey to allow the comparisons in the Main Features of this publication to be made. These changes consisted of excluding:

- innovation associated with the implementation of new or significantly improved organisational/managerial processes from the Australian data
- businesses with less than 10 employees from Australian data
- businesses in ANZSIC industry subdivision 77 Property Services in order to produce data for ANZSIC industry subdivision 78 Business Services from the Australian data
- businesses classified to ANZSIC industry division Agriculture Forestry and Fishing from the New Zealand data.

Research and Experimental Development

19 Data from the ABS *Business Research and Experimental Development* (R&D) publication are not directly comparable to the Innovation Survey 2003. R&D includes all ANZSIC divisions except Division A (Agriculture, forestry and fishing). The scope of the R&D collection is different to that of the Innovation survey as its frame is not based on the ABS Business Register but derived from various coverage sources. R&D is also a census of all businesses identified as performing R&D, whereas the Innovation Survey is a sample survey providing data which are weighted estimates. Care should be taken when comparing expenditure estimates as R&D collected information using a series of detailed questions, whereas in the Innovation survey information was collected as aggregates.

Other ABS surveys

20 Business counts shown in this publication may vary from other ABS sources. This reflects the differences in the scope and methodology between the Innovation survey and other ABS business surveys.

OUTPUT CLASSIFICATIONS

21 For output purposes, businesses are classified to employment and income ranges based on actual data reported in the survey. For other output groups (industry, State or Territory, Capital city, other areas) the classification is drawn from information held about the business on the ABS Business Register. The head office location of a business determined the State or Territory or region the business was classified to.

-
- RELATED PUBLICATIONS** **22** Other ABS publications relating to innovation in business in Australia are listed below:
- *Innovation in Manufacturing, 1996–97*, (cat. no. 8116.0)
 - *Innovation in Mining, 1996–97*, (cat. no. 8121.0)
 - *Innovation in Australian Manufacturing, 1994* (cat. no. 8116.0)
 - *Innovation in Selected Industries, 1993–94*, (cat. no. 8118.0)
 - *Research and Experimental Development, Business, Australia, 2002–03*, (cat. no. 8104.0)
- ABS WEB SITE** **23** The main features from this publication are published on the ABS web site <www.abs.gov.au>. Other information relating to Innovation in business can be found on the web site; see the Science and Innovation Home page under Themes/Industry.
- DATA AVAILABLE ON REQUEST** **24** As well as the statistics included in this publication, the ABS may have relevant data available on request. The availability of more detailed data are subject to confidentiality and quality checks. Inquires should be made to the National Information and Referral Service on 1300 135 070.
- ROUNDING** **25** Estimates of proportions shown in the tables are rounded to one tenth of a percentage point.
- 26** Where figures have been rounded, discrepancies may occur between the sum of the components/items and the total. In addition, percentages have been calculated using the unrounded figures.
- COMMENTS** **27** The ABS welcomes comment and suggestions from users regarding future surveys of Innovation in business in Australia. These comments should be addressed to the Director, Innovation and Technology Business Statistics Centre, Australian Bureau of Statistics, GPO Box K881, Perth, WA, 6842.
- ABBREVIATIONS**
- \$m million dollars
 - ABN Australian Business Number
 - ABS Australian Bureau of Statistics
 - ANZSIC Australian and New Zealand Standard Industrial Classification
 - ATO Australian Taxation Office
 - EU European Union
 - GST Goods and Services Tax
 - OECD Organisation for Economic Co-operation and Development
 - PAYGW pay-as-you-go withholding
 - PES post-enumeration survey
 - R&D research and experimental development
 - RSE relative standard error
 - SE standard error
 - SISCA Standard Institutional Sector Classification of Australia
 - TAU type of activity unit
 - TNTS The New Tax System
-

INTRODUCTION

1 As the estimates in this publication are based on information relating to a sample of businesses rather than a full enumeration, they are subject to sampling variability. That is, they may differ from the estimates that would have been produced if the information had been obtained from all businesses.

QUALITY ASSURANCE OF DATA

2 Inaccuracies in data may occur due to imperfections in reporting by businesses, form design, or in processing by the ABS. Such inaccuracies are referred to as non-sampling error. Every effort is made to reduce non-sampling error by:

- careful design and testing of questionnaires and data processing systems
- providing detailed instructions to providers on how to respond to questions
- detailed checking of reported data to ensure that it is logical, consistent and complete.

3 The data input editing process was supported by the conduct of a post enumeration survey (PES). The PES was conducted in person with data providers in several states and territories, and was used to identify issues with the quality of reported data. Quality issues were then targeted closely during the output editing stage of the survey to assist in minimising survey bias due to non-sampling error.

4 Caution should be exercised when using estimates of expenditure on innovation from this Innovation survey. Many businesses were only able to provide an estimate of expenditure associated with innovation. Negligible amounts recorded against some expense items may be due to the unavailability of information rather than minimal spending.

5 This survey had a lower than designed for response rate of approximately 82%. The design response rate was 92%. The lower response rate was addressed by ensuring non-response was not concentrated in any particular strata and by utilising the most appropriate method of imputation.

RELIABILITY OF ESTIMATES

6 The difference between estimates obtained from a sample of businesses, and the estimates that would have been produced if the information had been obtained from all businesses, is called sampling error. The expected magnitude of the sampling error associated with any estimate can be estimated from the sample results. One measure of sampling error is given by the standard error (SE), which indicates the degree to which an estimate may vary from the value that would have been obtained from a full enumeration (the 'true' figure). There are about two chances in three that a sample estimate differs from the true value by less than one standard error, and about nineteen chances in twenty that the difference will be less than two standard errors.

7 An example of the use of standard error on the total proportion of innovating businesses is as follows. From Table 1.1, the estimated proportion of total businesses innovating was 34.8%. From the Standard Error table in this section, the standard error of this estimate was 1.4%. There would be about two chances in three that a full enumeration would have given a figure in the range 33.4% to 36.2%, and about nineteen chances in twenty that it would be in the ranges 32.0% to 37.6%.

8 Detailed standard errors are available on request.

RELIABILITY OF ESTIMATES
continued

9 In this publication, indications of sampling variability are measured by relative standard errors (RSEs). The relative standard error is a useful measure in that it provides an immediate indication of the percentage errors likely to have occurred due to sampling, and thus avoids the need to refer also to the size of the estimate. Relative standard errors are shown in the Relative Standard Error table in this section.

10 Relative standard errors can be calculated using the actual standard error and the survey estimate (referred to as x) in the following manner:

$$RSE\%(x) = (SE(x)/x)*100$$

11 For example, from Table 1.1 the estimated proportion of total businesses that introduced any new or significantly improved goods or services was 16.6%. From the Standard Error table in this section, the standard error was 1.1%.

12 Applying the above $RSE\%(x)$ formula yields:

$$\begin{aligned} RSE\%(16.6\%) &= (1.1\%/16.6\%)*100 \\ &= 6.6\% \end{aligned}$$

13 For the tables in this publication, estimates with RSEs between 10% and 25% are annotated with the symbol '^'. These estimates should be used with caution as they are subject to sampling variability too high for some purposes. Estimates with RSEs between 25% and 50% are annotated with the symbol '*', indicating that the estimates should be used with caution as they are subject to sampling variability too high for most practical purposes. Estimates with an RSE greater than 50% are annotated with the symbol '**', indicating that the sampling variability causes the estimates to be considered too unreliable for general use.

14 It should be noted that RSEs of more than 10% are common when applied to very low proportions, as is the case in this publication.

15 Estimates of RSEs and SEs for the key indicators in this publication are shown in the following tables.

RELATIVE STANDARD ERRORS OF TYPES OF INNOVATION UNDERTAKEN, 2001–2003 (a), by selected business characteristics

	Total number of businesses	Proportion of businesses innovating	Number of businesses innovating	BUSINESSES WHICH INTRODUCED OR IMPLEMENTED		
				Any new or significantly improved goods or services	Any new or significantly improved operational processes	Any new or significantly improved organisational /managerial processes
				%	%	%
Employment size						
5–19 persons	1.5	5.9	1.8	9.6	7.7	8.5
20–99 persons	3.8	4.8	2.8	8.8	6.9	6.5
100 or more persons	5.3	5.0	4.4	8.2	6.9	7.2
Income size						
Less than \$100 000	11.0	25.3	3.7	54.2	33.5	30.9
\$100 000–less than \$1m	4.3	11.3	2.7	16.5	13.6	14.9
\$1m–less than \$5m	3.6	5.5	2.7	9.9	7.3	7.9
\$5m or more	4.8	4.5	3.2	7.9	7.0	6.9
State/territory						
New South Wales	1.9	7.7	2.9	13.0	10.7	11.1
Victoria	1.8	8.9	3.2	11.8	10.7	12.1
Queensland	2.0	9.7	3.0	13.4	13.2	13.3
South Australia	2.9	8.9	4.2	13.8	12.2	11.6
Western Australia	2.2	8.9	3.0	12.5	11.2	12.6
Tasmania	2.5	18.7	5.1	26.8	25.9	20.6
Northern Territory	5.7	23.3	6.2	27.7	20.1	32.3
Australian Capital Territory	4.8	19.8	5.8	34.5	25.6	21.6
Region						
Capital cities	4.3	7.9	3.3	9.7	11.4	10.2
Other areas	1.8	4.8	1.7	8.9	5.7	7.8
Industry						
Mining	2.7	11.1	3.6	21.5	14.9	14.4
Manufacturing	0.8	3.5	1.6	5.0	4.5	5.2
Electricity, gas and water supply	0.4	3.8	1.9	6.0	5.4	5.0
Construction	2.3	12.8	4.0	24.9	16.3	15.3
Wholesale trade	2.3	8.6	3.8	11.9	13.1	13.0
Retail trade	2.7	13.8	4.3	24.6	17.1	17.1
Accommodation, cafes and restaurants	4.0	16.8	4.6	21.4	21.4	20.2
Transport and storage	3.2	10.7	3.9	18.0	14.2	15.9
Communication services	2.6	9.1	5.0	13.2	11.0	12.5
Finance and insurance	6.3	11.5	5.7	16.8	14.3	13.9
Property and business services	2.2	11.6	3.8	19.0	13.8	14.5
Cultural and recreational services	2.3	9.3	3.5	17.6	13.2	12.2
Total	0.9	4.1	1.5	6.8	5.6	5.8

(a) Calendar years.

STANDARD ERRORS OF TYPES OF INNOVATION UNDERTAKEN, 2002–2003(a), by selected business characteristics

	BUSINESSES WHICH INTRODUCED OR IMPLEMENTED					
	Total number of businesses	Proportion of businesses innovating	Number of businesses innovating	Any new or significantly improved goods or services	Any new or significantly improved operational processes	Any new or significantly improved organisational /managerial processes
		No.		%	No.	%
Employment size						
5–19 persons	1 515	1.8	1 873	1.4	1.5	1.5
20–99 persons	1 077	2.2	795	1.8	2.1	2.0
100 or more persons	277	3.0	232	3.1	3.1	2.9
Income size						
Less than \$100 000	1 012	3.5	343	2.0	3.4	3.0
\$100 000–less than \$1m	2 224	2.8	1 426	1.8	2.0	1.9
\$1m–less than \$5m	1 862	2.3	1 430	2.0	2.1	2.1
\$5m or more	1 076	2.3	723	2.1	2.4	2.3
State/territory						
New South Wales	907	2.8	1 380	2.3	2.5	2.3
Victoria	613	3.1	1 119	2.0	2.4	2.5
Queensland	493	3.0	729	1.9	2.9	2.7
South Australia	253	4.1	368	3.3	3.7	3.5
Western Australia	300	2.9	399	1.7	2.5	2.7
Tasmania	65	4.9	129	2.7	4.5	3.5
Northern Territory	64	6.6	70	3.2	3.1	5.8
Australian Capital Territory	112	5.8	136	3.2	5.6	4.4
Region						
Capital cities	1 746	2.8	1 323	1.7	2.5	2.3
Other areas	1 710	1.6	1 638	1.3	1.4	1.5
Industry						
Mining	20	3.4	26	2.3	2.7	2.6
Manufacturing	157	1.6	304	1.4	1.3	1.3
Electricity, gas and water supply	1	1.9	4	1.3	1.8	1.7
Construction	289	3.9	499	2.4	3.3	3.4
Wholesale trade	305	3.7	505	3.1	3.3	3.5
Retail trade	802	4.3	1 295	2.5	3.7	3.1
Accommodation, cafes and restaurants	474	4.4	548	2.3	3.8	3.2
Transport and storage	158	3.7	194	2.8	3.7	3.4
Communication services	11	4.6	21	3.9	4.4	3.8
Finance and insurance	240	5.1	219	3.7	3.8	4.4
Property and business services	757	3.7	1 290	3.2	3.0	2.9
Cultural and recreational services	100	3.4	156	3.2	2.7	3.1
Total	1 234	1.4	2 012	1.1	1.3	1.2

(a) Calendar years.

GLOSSARY

Collaboration	Active joint participation with other organisations which involves some sharing of technical or commercial risk. Straight fee-for-service arrangements are deemed not to be collaborative and are therefore excluded.
Expenditure	Refers to the operating and capital expenditure as recorded in the Statement of Financial Performance and Statement of Financial Position for the business.
Financial reference period	Financial year ended 30 June 2003. Businesses with a different financial year were asked to report for a 12 month period which ended between 1 October 2002 and 30 September 2003.
Innovation	The process of developing, introducing and implementing a new or significantly improved good or service or a new or significantly improved process.
Innovating business	A business which, in the three calendar years to 2003, introduced any new or significantly improved good or service and/or implemented any new or significantly improved operational and/or organisational/managerial process.
Intellectual property	Refers to the ownership of ideas and control over the tangible or virtual representation of those ideas.
New good or service	<p>Any good or service or combination of these which is new to the business. Its characteristics or intended uses differ significantly from those previously produced by the business. Examples of new goods include: change of materials in goods; inclusion of environmentally-friendly components; introduction of smart-card; new type of paper for specific printers; development of flexible customer software; introduction of Global Positioning System (GPS); supply of multimedia applications; and cleaning cloths that don't require detergents. Examples of new services include: introduction of an extended warranty; introduction of pick-up service for customers; introduction of sale via Internet (e-commerce); existing services combined in a new form; introduction of electronic clearing systems; new or significantly improved insurance services; introduction of automated voice-response system; and introduction of telephone or internet bill payments system.</p> <p>Businesses were asked to include significant improvements to existing goods or services, but to exclude: routine upgrades of equipment; renaming or repackaging of existing goods or services; routine customisation of goods or services (e.g. individual tax returns produced for each client but using the same method and tools); and regular seasonal changes where a good or service is only produced at certain times of the year, but is essentially unchanged from the previous year.</p>
New operational process	A significant change for the business in its methods of producing or delivering goods or services. Examples of new operational processes include: digitalisation of printing processes; introduction of computer-assisted/based methods for product development; introduction of digital product labelling; development and introduction of digital distribution channels; reconstruction or reorganisation of sales rooms, if this enables easier shopping for customers; implementation of call-centre solutions; training of skilled labour to offer specially trained consulting services to customers; new or improved software or PC networks; introduction of electronic data interchange; new software tools for supply chain management; and introduction of automated or electronic ticketing system.

New operational process <i>continued</i>	Businesses were asked to include significant improvements to existing operational processes, but exclude process changes solely related to compliance with Goods and Services Tax (GST) legislation.
New organisational/managerial process	A significant change in the strategies, structures or routines of a business which aim to improve the performance of the business. Examples of new organisational/managerial processes include: changed corporate directions; introduction of new management techniques; improved business diagnostics or performance measures; significant workplace reorganisation; and significant changes to communication and information networks.
Non-innovating business	A business which, in the three calendar years to 2003, did not introduce any new or significantly improved goods or services and did not implement any new or significantly improved operational and/or organisation/managerial processes.
Non-technological innovation	Non-technological innovation covers all innovations which are excluded from technological innovation. This means it includes all the innovations of firms which do not relate to the introduction of a technologically new or substantially changed good or service or to the use of a technologically new or substantially changed process. The major types of non-technological innovation are likely to be organisational and managerial innovations. For example: the implementations of advanced management techniques such as total quality management; the introduction of significantly changed organisation structures; and the implementation of new or substantially changed corporate strategic orientations.
Percentage of foreign ownership	The percentage of ordinary shares or voting stock of a business held by non-residents of Australia.
Research and experimental development	Comprises creative work carried out systematically to increase the stock of knowledge and its use to devise new applications.
Technological innovation	Technological product and process (TPP) innovations comprise implemented technologically new products and processes and significant technological improvements in products and processes. A TPP innovation has been implemented if it has been introduced on the market (product innovation) or used within a production process (process innovation). TPP innovations involve a series of scientific, technological, organisational, financial and commercial activities.

FOR MORE INFORMATION . . .

INTERNET **www.abs.gov.au** the ABS web site is the best place for data from our publications and information about the ABS.

LIBRARY A range of ABS publications are available from public and tertiary libraries Australia wide. Contact your nearest library to determine whether it has the ABS statistics you require, or visit our web site for a list of libraries.

INFORMATION AND REFERRAL SERVICE

Our consultants can help you access the full range of information published by the ABS that is available free of charge from our web site, or purchase a hard copy publication. Information tailored to your needs can also be requested as a 'user pays' service. Specialists are on hand to help you with analytical or methodological advice.

PHONE 1300 135 070

EMAIL client.services@abs.gov.au

FAX 1300 135 211

POST Client Services, ABS, GPO Box 796, Sydney NSW 2001

FREE ACCESS TO STATISTICS

All ABS statistics can be downloaded free of charge from the ABS web site.

WEB ADDRESS www.abs.gov.au



2815800013031

ISSN 1448 5206

RRP \$31.00